Florida Atlantic University
Academic Program Review
Department of Biological Sciences
Self-Study Report (1-6-15)

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A. Mission and Purpose of the Program

The 21st Century brings new career opportunities in the area of life sciences, ranging from biomedical research to environmental sciences. Many of these new jobs require a non-traditional education that crosses disciplinary boundaries. The mission and challenge for the Department of Biological Sciences is to train students for traditional careers such as medicine as well as the emerging careers in a global economy. The Department of Biological Sciences offers both B.S. and B.A. degree programs in biological sciences. These programs are designed to prepare students for careers in life sciences and advanced education in graduate and professional schools. We also provide graduate education leading to M.S. degrees in biological sciences and environmental sciences; Masters in Teaching degrees (M.S.T.); Professional Science Masters in Business Biotechnology (P.S.M.); as well as Ph.D. degrees in Integrative Biology (IB). Our IB Ph.D. degrees will soon offer the options to focus on neuroscience or environmental sciences (currently pending review by the University Faculty Senate).

Overview of the Department

The Department of Biological Sciences is now the largest department in the University and a leader in three areas of effort; teaching, research and service. The number of undergraduate majors has been growing steadily; we now have over 2500 declared majors and 300 students graduate per year with Bachelors degrees in Biology. The number of student hours of instruction for majors and non-majors is the largest in the Charles E. Schmidt College of Science (CESCOS). In spite of the large size and consequent workload of faculty, the Department is an innovator in education and has obtained NSF education grants, developed an Honors program that was the blueprint for the University wide Honors program and has engaged greater than 10% of the undergraduate majors (>250 students) in some form of research. A significant number of the honors students have worked on capstone thesis projects and many published papers with their mentors.

The Department has three primary geographic sites with roughly equal faculty distribution: Davie, Boca Raton and Jupiter as well as one faculty member at Fort Pierce. The Department's teaching load is dominated by teaching in Boca and we accommodate this by faculty commuting to Boca as well as with tele-conferencing. We are also shifting commuter students to the two satellite campuses to re-distribute the teaching load and to maximize the use of space. We have done this very successfully with the Davie campus where we increased the number of seats filled in classes from less than 100 in 2007 to more than 400 in 2013.

In research, we have focused on the local resources at each geographic site and developed Neuroscience in Jupiter, Environmental Science in Davie, Organismal Biology in Boca and Marine Biology in Fort Pierce. The neuroscience group has begun to mature since moving to Jupiter (18 months ago) and we have published more papers than our famous neighbor the Max Planck Florida Institute with similar number of faculty. There is considerable on-going funding and in the last few months our faculty have received new grants from federal agencies: Dr. Marguerite Koch based on the Boca campus with the collaboration of Dr. Xing-Hai Zhang has received $422,788 from

NSF for their work on climate change and Dr. Kailang Jia based in Jupiter received $356,678 from NIH for his work on molecular aspects of aging.

B. Previous External Reviews
Findings and Recommendations
Our last Program Review was in 2009 and the strengths in research at the time were: 1) A new Director of Environmental Sciences who was developing strong connections to the National Park Service and the South Florida Water Management District and 2) The recent establishment of The Scripps Research Institute in Florida (2004) and the Max Planck Florida Institute (2009) on the MacArthur campus in Jupiter, Florida.

The major weaknesses were listed as the relatively small size of the faculty in comparison to the ever-growing undergraduate population. Additionally, the lack of resolution in the Marine Science Program within the Department as it connects to the Harbor Branch Oceanographic Institution (HBOI) was criticized.

The major research recommendation was to enhance our collaborations with local institutes, state agencies and the biotechnology industry. In particular, it was suggested that we foster research alliances with The Scripps Research Institute and the Max Planck Florida Institute, both located on our Jupiter campus, and continue to develop our connections to the National Park Service and South Florida Water Management District and enhance our connections with HBOI.

Major Changes Since Last Review
Since the last Program Review in 2009, several new faculty members have joined the department and established their own research programs; Drs. Kailiang Jia in 2009; Brian Benscoter in 2010; Greg Macleod in 2013; and Marianne Porter and Rindy Anderson in 2014. Dr. Macleod is the first joint faculty member between the CESCOS and the Honors College. All of these investigators, except those hired this year, have obtained external funding and are engaging in competitive research. In addition, two former administrators, Drs. M.J. Saunders and Brenda Claiborne joined the department in August, 2013. Unfortunately, we have also lost two faculty members during this period (Drs. Ayanathan in 2011 and Nambu in 2014).

<u>The Davie Environmental Science Initiative</u>
At the time of the last review a new building, called Davie West, was being built on the Davie campus. The building is finished and now houses nine FAU Biology faculty members with research specialization in Environmental Science. The building is shared with scientists engaged in environmental research and Everglades restoration efforts from the University of Florida, the Institute for Food and Agriculture (IFAS) and the US Geological Survey (USGS). The most recent Biology faculty member is a behavioral ecologist who will be based in Davie. A separate administrative unit, The Florida Center for Environmental Studies has recently (2014) moved to Davie and this will add cohesion and focus to the Davie effort. In brief, although it is a multi-departmental endeavor, biologists have led the way in establishing Davie as a focal point for

Environmental Science. At the graduate level, we are establishing a track within our Ph.D. program called Integrative Biology and Environmental Science (IB-ES).

The Jupiter Life Science Initiative

One of the recommendations of the last review was to develop connections to the large research institutes being built in Jupiter, Florida. The state invested nearly $1 billion dollars to bring the Scripps Research Institute in Florida and the Max Planck Florida Institute to the MacArthur campus. In order to enhance our interaction with these two large research institutes in Jupiter, first, the Center for Molecular Biology and Biotechnology (CMBB), led by Dr. Herb Weissbach, moved to the Jupiter campus in 2010 and began collaborating with the Scripps, Florida Institute. In 2011, we transferred a group of seven neuroscience faculty members from Boca to the MacArthur campus in Jupiter (1). We renovated a building adjacent to Scripps and Max Planck on the Jupiter campus to our specifications and it now houses the neuroscience group consisting of six Biology faculty members, and one Psychology faculty member and 40 staff and students, with two more biologists being recruited. At the graduate level, in collaboration with Max Planck and Scripps Florida we are establishing a track within our Ph.D. program called Integrative Biology and Neuroscience (IB-N) and this is attracting attention and beginning to grow.

Undergraduate Initiatives

The number of majors in Biology has continued to increase at the rate of 5-10% per year and now stands at over 2500 majors. This stresses our resources and we have had to adjust our methods of program delivery to accommodate the growth while continuing to bring innovative pedagogies to the classroom.

At the undergraduate level a joint Neuroscience and Behavior program between the Biology and Psychology departments, resulting in a certificate for students, has suddenly gathered momentum on the Boca campus and has grown to 300 majors in three years.

We used an NSF Undergraduate Research and Mentoring grant (NSF# 0829250, $700,570, entitled “Undergraduate Research and Mentoring: Integrative Biology for Future Researchers”, 2008-2013, herein referred to as NSF-URM) to design research experiences for undergraduates placing students in research labs, mentoring them toward research careers and helping place them after graduation. Based on the results of this NSF-funded program, we established a research intensive Honors Program (2). Although the NSF grant has ended, the Biology Honors program continues to operate and has become the model for the entire University in the form of the Quality Enhancement Plan (QEP) program (3).

Using a grant from the FAU Technology Fee program, we have established two computer teaching labs in the department that are being used for a growing number of courses. We are using simulation studies as a proxy for research projects. For example, a new neuroscience course uses simulation software to teach neuronal function as well as teaching students to think critically and creatively about brain function as they

develop projects of their own creation. This facility has allowed us to expand bioinformatics beyond a select graduate population to the undergraduate level.

Finally, we are reorganizing the curriculum as we try to enhance the student experience to introduce critical thinking and move research-like experiences into the lower level of the curriculum. For instance, we are now offering *Life of a Scientist* to sophomores to expose students early-on to research, why we do it and to encourage them to become actively involved. Recently we have written two educational grants focused on moving research experience to the sophomore year since studies have shown that this enhances retention in the STEM fields (4). These grants are focused on using simulation and *in silico* experiments to introduce large numbers of students to the research enterprise.

C. Instruction

Establishment of Student Learning Outcomes (SLOs)

Our NSF-URM Program is being sustained as FAU's Biology Honors Program and received a high rating from the Southern Association of Colleges and Schools Commission on Colleges (SACS). Both NSF-URM and the Biology Honors Programs, served as models of institutional best practices for FAU's QEP (as mentioned above). The goals for the Department of Biological Sciences undergraduate programs are consistent with FAU's definitions of: 1) content knowledge, 2) critical thinking skills and 3) communication skills, within our discipline. Our program is designed to educate and evaluate our students in biological sciences in each of these student learning outcomes (SLOs):

1. Content Knowledge

Declarative knowledge: Students will demonstrate knowledge of the vocabulary, history, theories or concepts. Declarative knowledge is usually assessed via in-class or standardized tests, typically in an objective (multiple-choice; short answer) format.

Procedural knowledge of research skills: Students will demonstrate knowledge of the procedures involved in research (e.g., process of scientific inquiry, idea generation, literature review, data collection, reporting). These skills are usually measured via the evaluation of a research project, thesis or dissertation.

Procedural knowledge of technical skills: Student will demonstrate technical skills (e.g., microscopy, staining, dissections, cell culture, electrophoresis). This type of procedural knowledge is assessed by both written and practical laboratory examinations.

2) Critical Thinking

Analytical skills: Students will analyze, evaluate, compare/contrast or judge discipline-specific theories, issues, events, or other content. This is usually assessed through examining the quality of argument in a student essay, oral presentation or formal report.

Practical skills: Students will put into practice their knowledge and skills within the laboratory.

Creative skills and ability to formulate questions: Students will create a product by synthesizing knowledge from a discipline.

3) Communication

Written communication: Students will produce writing that is grammatically correct, well organized, and properly formatted for the purpose of the assignment and the discipline. This is usually assessed via individual paper assignments where instructors assess the quality of written expression.

Oral communication: Students will prepare and deliver informative and/or persuasive oral presentations that attend to the audience and are well organized. This is usually assessed via individual oral presentations in a classroom setting.

Team/collaborative communication: Students will demonstrate team-oriented, collaborative skills in which they contribute to group products. This is usually assessed via group laboratory exercises.

4) Ethical Conduct

Ethical conduct is monitored during all academic components including working with live animals. Some of the ethical issues discussed directly during the lectures include responsibilities while: working in a laboratory, collecting and recording data, writing and discussing results and working with live animals.

All individuals working in a lab setting are required to take three Environmental Health and Safety (EH&S) courses: 1) Lab Safety, 2) Biosafety and 3) Hazardous Waste Handling and Awareness. Additional trainings are offered by EH&S and depend on the nature of the research being carried out. For example: individuals working with cells in culture will be required to complete Blood-Borne Pathogens Training.

Throughout the curriculum, faculty members are encouraged to model ethical behavior when mentoring at both academic and research levels. Academic integrity is emphasized and practiced during data collection in the lab and during classroom activities. Scientific dishonesty is not tolerated.

Assessment of SLOs and Program Improvement

The Department, with help from the Environmental Science Program, routinely assesses its two undergraduate programs, three certificates and seven graduate programs through overlapping courses. The B.A. and B.S. degrees are assessed together, using the same criteria. These four criteria listed above are aligned with the University's overarching goals of having students learn content, and develop their skills in critical thinking and communication. The three certificates that are offered in the department are: 1) Biotechnology, 2) Neuroscience and Behavior and 3) Environmental Science.

SLO Outcome #1 is assessed in four classes with broad coverage, taken by all, or nearly all Biology majors. These are Biological Principles, Biodiversity, Microbiology, and Genetics. During summative assessments in these classes, a suite of anchor questions are used, that test the broad range of knowledge. Anchor questions range from simple to complicated so that poor, acceptable, and good performance can be determined.

SLO Outcome #2 is also assessed with anchor questions, in which critical thinking is required.

SLO Outcome #3 is assessed from the written and oral communication of students in labs. Currently the average student scores for these outcomes exceed the criteria set for success.

SLO Outcome #4 is partially assessed by EH&S on exams. Monitoring for plagiarism is conducted by individual professors using the SafeAssign or Turnitin programs (available on FAU's BlackBoard site). A more formal assessment of plagiarism is needed and under discussion.

The Academic Learning Compacts (ALCs) for both the Bachelors of Science and the Bachelors of Arts are included in Appendix A. Assessment of graduate programs is described below in the "Graduate Programs" section.

Baccalaureate Programs

i. State-approved prerequisites –

The Department of Biological Sciences has four Intellectual Foundations Program (IFP) core curriculum courses; see also Appendix A. These are:

BSC 1005 & BSC 1005L: Life Science and Life Science Lab (three credits including lab)
BSC 1010 & BSC 1010L and BSC 1010D: Biological Principles (four credits including lab and discussion)
BSC 1011 & BSC 1011L and BSC 1011D: Biodiversity (four credits including lab and discussion)
BSC 2085 & BSC 2085L: Anatomy & Physiology (four credits including lab).

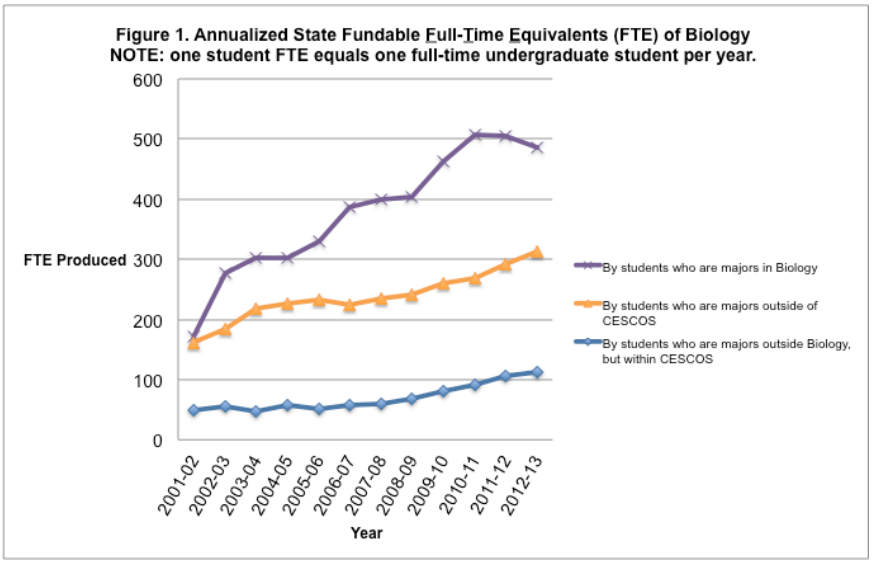
The University's Core Curriculum Committee has thoroughly reviewed these courses for compliance with Florida State University System (SUS) requirements per regulation 6.017. The University Undergraduate Programs Committee (UUPC) recommended these courses for approval to the faculty senate and they were all approved.

ii. Limited access – Not applicable.

iii. Admissions criteria –

Incoming Biology majors must meet admissions criteria established by the University as described in the University catalogue:
http://www.fau.edu/academic/registrar/FAUcatalog/admissions.php

iv. Undergraduate enrollment information –
As Figure 1 [full-time equivalents (FTE) by major or not] and Figure 2 (FTE across the CESCOS) and Table 1 demonstrate, the number of undergraduate majors in Biology represents approximately 45% of the total CESCOS and 10% of the entire university. Placed in the context of the student credit hours, the department generates approximately 30% of the teaching in the CESCOS and 5% of the entire institution. The graphs also show that these numbers have been growing steadily for the last decade and growth has been especially strong since the last program review in 2009. See Tables A and B in Appendix B for raw data.



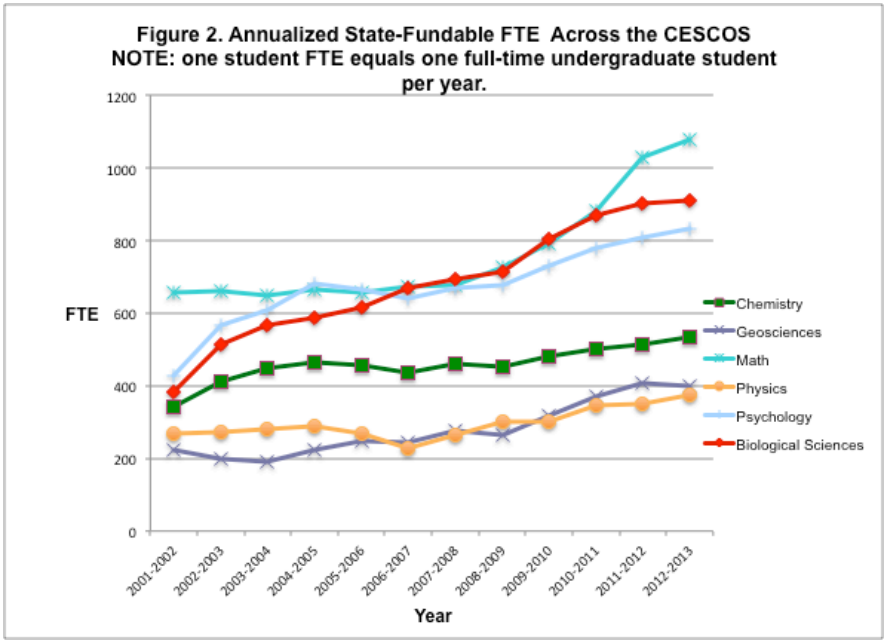
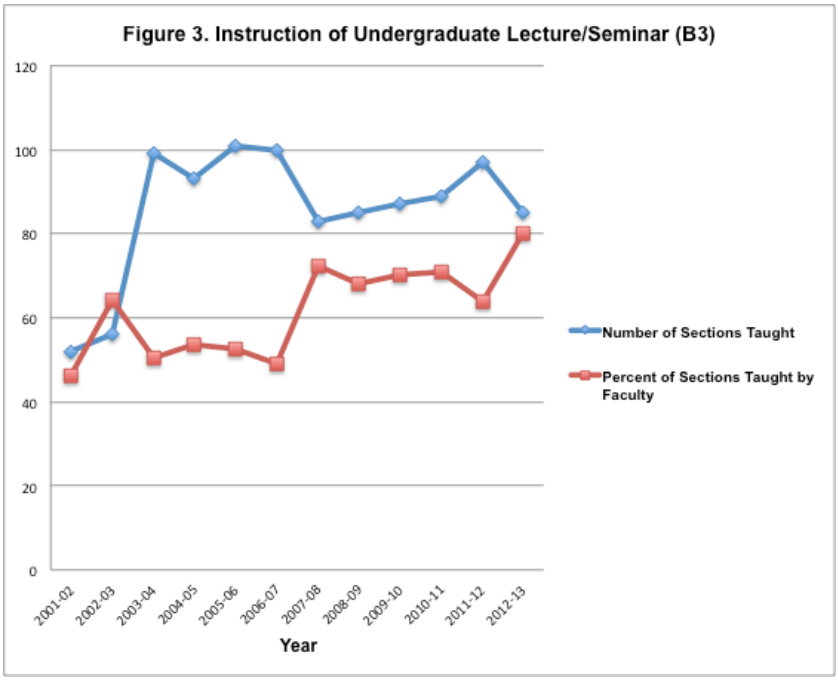


Table 1: Undergraduate Annual Headcount
And Annualized State-Fundable FTE In Biology (2011-2013).
NOTE: one student FTE equals one full-time undergraduate student per year.

Annual Headcount (Program CIP: 260101)	Biological Sciences		College Total	University Total
	2011-2012	2012-2013	2012-2013	2012-2013
Bachelors	2,486	2,582	5,617	28,523
Annualized State-Fundable FTE	Biological Sciences		College Total	University Total
	2011-2012	2012-2013	2012-2013	2012-2013
	828.1	846.4	3,948.6	15,335.0

v. Undergraduate average class size and faculty/student ratio
The faculty/student ratio has increased from 1:67 to 1:96 over the past five years. **Eighty percent** of our undergraduate lectures and seminars were taught by faculty members in 2012-2013, regardless of the huge student population, (shown in Figure 3 below and Table B in Appendix B).



vi. Curriculum –
The curricula for both Bachelors of Science and Bachelors of Arts in Biology are attached in Appendix A and are available on-line at:
http://www.fau.edu/uas/curriculum.php

vii. Internships, practicum, study abroad, field experiences –
The Department now places undergraduate research students in a variety of institutions and programs to enhance their education and career prospects. We used an NSF-URM grant (mentioned previously) to design research experiences for undergraduates placing students in research labs, mentoring them toward research careers and helping place them after graduation. Approximately 90% of the students were placed in graduate school or professional school or employed in life science-oriented careers after the program. We have built on this experience to create an Honors Thesis program to accomplish the same thing and have maintained the same number of students in research labs even after the end of the NSF grant (NSF did not allow renewal of these grants as they cancelled the program). With our expansion in Environmental Science and Neuroscience we have expanded the number of slots available in a number of institutions. At the Jupiter campus both Scripps and Max Planck investigators are willing to take undergraduates into their labs. In Environmental Science numerous faculty take undergraduates into their labs and provide environmental field experiences and the National Park Service funds fellowships to work in the Parks.

viii. Pedagogy/pedagogical innovations –
Biology regularly supports faculty to attend the HHMI/National Academies of Science (NAS) Summer Institute. In order to take advantage of educational trends and advances around the country we have sent eight of our faculty to the HHMI/NAS summer institute. Most recently, Dr. Tim Theisen (an Instructor) and Dr. Brian Benscoter (an advanced Assistant Professor) attended the summer institute in 2014. These faculty members then returned to the department and have taken over various curriculum improvements. Dr. Evelyn Frazier, helped develop and now runs the Honors Programs in Biology, including mentoring of undergraduate researchers. Dr. Colin Hughes, has taken over departmental curriculum and assessment oversight. Dr. Joe Caruso is implementing the California Critical Thinking Test for assessment purposes. Other faculty members have developed new interactive pedagogies for large enrollment courses in human ecology and genetics, “flipped” their classes, use iClickers in their large courses and implement inquiry-based teaching.

Dr. Jay Lyons uses computer simulations in his undergraduate courses: PCB 3703 and PCB 3704 Human Morphology and Function 1 and 2. He uses both iWorx stations (5) to simulate human physiology and Neurons in Action (6, 7) to simulate neuronal responses. Although these are primarily upper division undergraduate course, the iWorx stations are being used on the Davie campus to assist in teaching BSC 2085 & BSC 2085L Anatomy and Physiology at the sophomore level. Dr. Sarah Milton also uses iWorx (5) for PCB 4723 Comparative Animal Physiology, doing cardiac responses and the EKG lab, a pulmonary lab and a reflex/neuronal response lab. These are not simulations; however, they are computer recordings of experiments the students do on themselves (basically, a chart recorder). She also implements PhysioEx (8) to look at nerve function, which is an actual simulation.

In the Introductory courses, LifeLine discussions (a required component of both freshmen Biology courses: BSC 1010 Biological Principles and BSC 1011 Biodiversity and described in more detail later) a number of new pedagogies have been implemented:

- With the help of Honors students, we have developed an inquiry based activity used in BSC 1010 Biological Principles now as one of the Experimental Design labs, where students make observations, draw conclusions from historical data and present day observations about the FAU Preserve, gopher tortoise habitat and invasive plant species.
- We have developed a "Best Practices" activity where TAs and LifeLine leaders are filmed teaching in the Spring, and shortly after the Fall semester begins, we do mandatory Teaching Effectiveness training for TAs. This activity evolved after faculty members went to the Summer Institute in Madison. Our TAs love to see themselves in video, so we have their undivided attention, and they learn something, too. We do peer evaluations of each TA and LifeLine leader every semester, giving faculty members some feedback early in the semester.
- We have implemented a bioethics unit for both BSC 1010 Biological Principles and BSC 1005 Life Sciences labs having to do with stem cell use that has students thinking critically about the viewpoints of others as well as other types of people as stakeholders versus their opponents. This was adopted and edited from a Northwest Association for Biomedical Research activity where students assume the role of one of a variety of stakeholders (e.g., a Catholic priest, a parent of a child with juvenile diabetes, a family member of someone with a severed spinal cord, a Muslim clergyman, a conservative congressman, a biotech CEO) so that students, after learning about the sources and variety of stem cells, argue for or against their use, not as individuals, influenced by their own beliefs, but as whatever person they pull out of a hat, causing them to see things from another point of view. We also have a pre-lab activity where we give a quiz about their prior knowledge on this subject.

In BSC 2085, BSC 2085L, BSC 2086 and BSC 2086L Anatomy and Physiology 1 and 2 and labs, with the help of our TAs, we have created and are using the Practical Anatomy Review (PAR) on-line quiz tool. Created to provide the Anatomy and Physiology lab students weekly "practical-like" timed questions to enable readiness for their lab practicals, as well as opportunities to earn quiz credit and extra credit points to improve the passing rates. PAR has significantly lessened the withdrawal rate prior to the midterm and definitely reduced the number of D's and F's in these labs.

We are farther reorganizing the curriculum as we try to enhance the student experience to introduce critical thinking and move research-like experiences into the lower levels. We have written two educational grants focused on moving research experience to the sophomore year since studies have shown that this enhances retention in STEM majors (4). Our primary goal is to use simulations in order to introduce large numbers of students to research. For example, Dr. Dawson-Scully has begun teaching Neuroscience Simulations in small classes using the Neurons in Action software (6, 7). About two thirds of the course is devoted to knowledge acquisition of the simulation

software and the examination of the basic cellular function of neurons and synapses. The other one third of the course is devoted to students inventing their own approaches to their own questions using this flexible software. Many variations were presented as past students used the software for projects as diverse as heat stroke in bulldogs, Alzheimer's disease effects on neuronal function and climate change effects on neuronal function.

Our tri-institutional [FAU, Scripps Florida and Max Planck Florida Institute (MPFI)] neuroscience program is exceptional in providing outstanding equipment and facilities to our students, from molecular biology to highly technical imaging and electrophysiology methods. MPFI has started an MPFI-scholars program for FAU undergraduates that lasts from 1-2 years and has engaged more than twenty students. Earlier this year TSRI was awarded a three-year NSF-REU grant "SURFing the Interface between Chemistry and Biology" to support undergraduate students in their programs. Our tri-institutional (FAU, TSRI and MPFI) neuroscience program not only expands FAU's ability for research mentoring by increasing the faculty number, but also offers more state-of-the-art prospects for scientific meetings, discourse and dissemination.

Upon completion of their research projects, students disseminate their research findings at the undergraduate research symposium sponsored by OURI, as well as, at numerous scientific meetings and symposia ranging from regional meetings for neuroscience at the University of Miami (UM) to a local Drosophila neuroscience meeting (organized jointly by FAU, TSRI and UM). This was the second year for the Life Sciences South Florida STEM Research Symposium. Our students earned first place in each of the two oral presentation categories. Students also report their findings at major national and international meetings (e.g., the Society for Neuroscience).

Though data on scholarly activity is not officially available for undergraduate students, an internal poll of the departmental faculty demonstrates that in 2012-2013 (including the summer of 2012) **224** undergraduate students engaged in scientific research in the Department of Biological Sciences. Our undergraduate researcher population reflects FAU's overall undergraduate population with 47% underrepresented minorities (see Table C in Appendix B). The undergraduate directed independent research reflects the diversity of the department with studies including bacterial metagenomics, turtle environmental stress, sea turtle research, Everglades ecotone seagrass, Sphyrna swimming kinematics, cancer, drug discovery, seizure characterization and plant biotechnology. Undergraduate students performing directed independent research publish in peer-reviewed international journals, as well as FAU's Undergraduate Research Journal (URJ).

The Department of Biological Sciences offers paid full-time summer research experiences for undergraduates in Jupiter. These are exciting and once-in-a-lifetime chances for undergraduates to perform research in sophisticated neuroscience labs while expanding their scientific expertise, networking, critical thinking skills, reasoning and troubleshooting abilities. Undergraduates are competitively chosen, work full-time in the lab and spend at least one hour per week with the fellow undergraduates in the

program and a faculty mentor delving deeper into the scientific experience. At the end of the summer, each student presents his/her research findings in a mini-symposium open to the public. Our experience has been that all of the summer students continue working in the same labs during the next academic year.

ix. Scope of institutional contributions –
The Department of Biological Sciences is the largest contributor to FAU's Institutional Honors Program. Our NSF-URM program is being sustained as FAU's Biology Honors Program (2) and received high rating from the Southern Association of Colleges and Schools Commission on Colleges (SACS). Both NSF-URM program and the Biology Honors Program, served as models of institutional best practices for FAU's QEP. FAU's university-wide QEP has and continues to expand undergraduate research and inquiry opportunities as part of our accreditation's reaffirmation by SACS. The QEP provides curricular and co-curricular opportunities for students and faculty across all disciplines and colleges to be engaged in research using a framework of developmental scaffolding (i.e. exposure, followed by suitable prospects for facilitated skill-building, and culminating in intensive, more independent research projects). The previously mentioned SLOs comprising the research cycle were articulated as part of FAU's QEP. FAU has established the Office of Undergraduate Reach and Inquiry (OURI) that offers a clearinghouse for information for both curricular and co-curricular research and inquiry opportunities within FAU to support the QEP.

The Department of Biological Sciences has a long-standing commitment to improving educational outcomes in STEM fields. We have programs in place for over ten years to enhance student success in introductory biology courses, typically the first STEM courses taken by undergraduates Our peer-led sessions, known as LifeLine, include conceptually oriented lectures, interactive classroom strategies, lab experiments and learning activities. These required sessions consist of 24 students and provide a more intimate context than the lecture (which consists of 300 to 400 students). During these LifeLine sessions, activities reinforce key concepts using various instructional approaches, including construction of physical models and concept mapping. These programs have reduced the failure and drop out rates of the targeted courses significantly and have been continually supported by consecutive Deans of the CESCOS.

The department presents very large service courses for the benefit of non-major undergraduate students including BSC 1005 Life Science (1600 students per semester) and BSC 2085 Human Anatomy and Physiology (1000 students per semester).

A joint Neuroscience and Behavior undergraduate cross-disciplinary program between the Biology and Psychology departments offering students a certificate has gathered momentum on the Boca campus and has grown to 300 majors in just three years.

The Environmental Science Program is another cross-disciplinary program and involves faculty members from many participating colleges and departments, including Biological Sciences, Geosciences, Chemistry, Philosophy, Economics, Urban and Regional

Planning, HBOI and the Center for Environmental Studies. Biology faculty and staff members comprise over 40% of this program.

The Department of Biological Sciences has hired a joint faculty member with the Honors College and has brought an array of CESCOS courses to the Jupiter campus, strengthening cross-college ties.

x. Undergraduate student profile –
Undergraduate and graduate students with a Biological Sciences Major have the ethnic composition of 43% white, 19% black, and 24% Hispanic and 3% non-resident aliens. Indeed, of the 30,429 students enrolled at FAU (all colleges) in fall 2013 whose ethnicity was known, 16,810 were white and 13,619 were underrepresented minorities. Over the last five years, black and Hispanic enrollments have increased more than that of any other groups; FAU's student body will soon be a "majority minority" mirroring the predicted demographic composition of the USA in the near future. In 2012-2013, undergraduate students with a Biological Sciences Major were 63% female and 37% male, representative of the CESCOS (66% and 34% repspectively). The data on the undergraduate student profile is included in Table D in Appendix B.

Undergraduate Pell eligible students in the Department of Biological Sciences averaged 44.7% since fall 2010. The OURI has awarded Biology undergraduates $7,700 in research funds (2013-2014). Biology undergraduates have published four articles in FAU's URJ (since its inception in 2012) as well as, peer-reviewed international journals. Finally, Biology undergraduates had 25 presentations (four talks and 21 posters) and 21 presentations (two talks and 19 posters) at the OURI symposia in 2013 and 2014, respectively.

A wide variety of scholarships are available to incoming freshmen and transfer students from FAU's Office of Undergraduate Admissions and are listed in Appendix A. Additional scholarships are available through FAU's Office of Financial Aid.

xi. Advising procedures –
Advising of undergraduate science majors in centralized in the CESCOS Student Services Office. The advisors assigned to biological sciences work closely with administration of the department to ensure students are given correct guidance.

Advising begins at orientation and continues through the first 45 credits in the University Advising Services Office and includes:

- Evaluation of IFP/General Education and Language Requirements.
- Initial advising for foundational coursework in the major including: Biological Principles, Biodiversity, General Chemistry I and II with laboratory, Organic Chemistry I and Mathematics through Algebra, Trigonometry and Methods of Calculus.
- Guidance in minors and certificates appropriate to vocational career objectives.

Ongoing advising occurs in the CESCOS Student Services Office for the remainder of the program and includes:

- Follow up on IFP/General Education and Language Requirements.
- Recommendations for required core courses.
- Continued guidance in minors and certificates appropriate to vocational career objectives.
- Students are directed to seek individual faculty advising regarding research experiences.

In our Honors Program, undergraduates are advised one-on-one by the faculty member in-charge, Dr. Evelyn Frazier.

xii. Licensure rates – Not applicable.

xiii. Placement rates/employment profile –
Though it is true that no official effective procedure/system is in place to track what students do career-wise post-graduation, internal recruiting suggests that ~27% of IB Ph.D. enrollees have completed a B.S. at FAU, 22% have completed a M.S. at FAU and 9% have completed both B.S. and M.S. degrees at FAU prior to entering the IB Ph.D. Program.

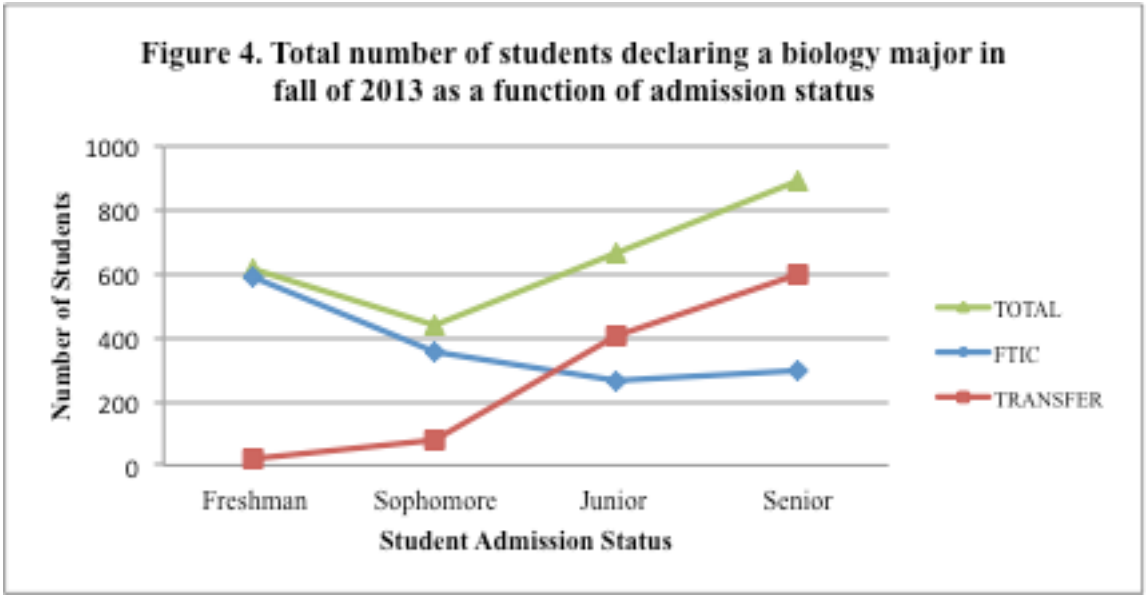
In our NSF-URM Program (previously described), 77% of the students were placed in graduate school or professional school after graduation. Another 10% were employed in life science-oriented careers and 10% were unknown.

Table E shows IEA data obtained through Biology graduating senior surveys. Although an average of only 25% of graduating seniors with Bachelors degrees in Biology responded, over 73% of graduates reported that they will pursue graduate or professional education, and are very satisfied or satisfied with FAU's preparation for graduate or professional school and will reside in South Florida. This data demonstrates the motivation from the Department of Biological Sciences towards the pursuit of education, as well as our ability to fuel the local economy.

xiv. Retention rates –
The 2012 PCAST report (9) suggests there is an emerging problem for the future national scientific work force because college students drop out of the STEM disciplines at very high rates. It has been demonstrated in a variety of contexts that large numbers of students (60% in most studies) exit the STEM curriculum in the first two years of college, never to return. For minorities, the numbers are even worse. Numerous studies have demonstrated that 80% of minorities exit the sciences by the end of the sophomore year. Students switch to non-STEM degree programs, they fail to demonstrate adequate academic progress (e.g. doing poorly in STEM courses), or they become bored (10). As a result, many leave the university.

Recent analysis of Biology student data shows an interesting caveat to the typical "STEM death march". An examination of enrollments in life science degree programs

indicates an interesting “turnover effect” in our undergraduate majors. As shown in Figure 4, the number of first time in college (FTIC) students in the Biology major drops precipitously by the end of the sophomore year, just as shown in national studies of persistence in STEM programs. However, at FAU these students are replaced by an equivalent or greater number of incoming transfer students. So, although our Biology degree programs appear to sustain some net persistence, many individual students are not persevering. This is why it is important to consider measures of retention and success in STEM at the student level, per se. If we can intervene during sophomore year and the transition to the junior year, we can increase the retention rate for life science majors. Thus, we have written two educational grants to pursue funds for reorganizing our curriculum (as discussed above).



xv. Graduation rates –

The University and the Board of Governors (BOG) have established three performance matrices to specifically evaluate retention and graduation data for institutions in the Florida State University System (SUS). These metrics are being used to rank the institutions in the SUS. These are: BOG Metric 4: six-year graduation rate for full- and part-time FTIC students (46% see Table F in Appendix B); 2. BOG Metric 5: academic progress rate, which is measured by the second year retention of students with a Grade Point Average (GPA) above 2.0 (75% see Tables G and H in Appendix B); and 3. BOG Metric 6: Bachelors degrees awarded in areas of strategic emphasis (includes STEM) (see Table 2 below). In summary, the data show that roughly 15% FTIC Biology majors graduate after four years, while 46% graduate after six years. These metrics match FAU as a whole and this means the Department of Biological Sciences with its large student body is part of the problem that the BOG has created. These FAU graduation rates are similar to national averages; FAU is being penalized for this metric in spite of the arguments that can be made justifying these numbers. We could change these rates by raising the GPA requirements for biology majors but this will presumably simply shift the problem to other departments.

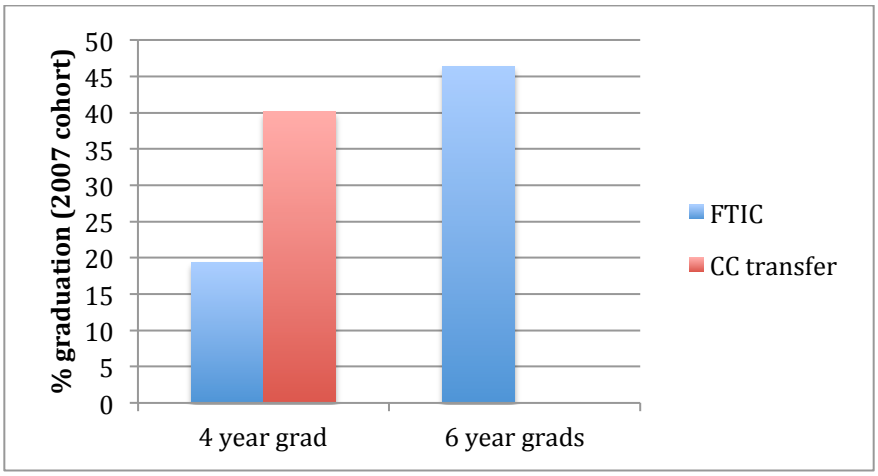
Table 2 from IEA shows the total number of B.A./B.S. degrees in Biological Sciences awarded, by year, since 2001-2002. A degree awarded with a single major contributes one degree, and a double major, contributes one-half degree.

Table 2: Total Number Of B.A./B.S. Degrees In Biological Sciences Awarded, By Year, Since 2001-2002.

	Year Degree Granted													All
	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	
Bachelors	156.0	157.5	188.0	173.0	225.5	236.5	235.0	239.5	248.0	275.0	317.0	296.5	370.0	3,117.5

Figure 5 with data taken from IEA tables (Tables F through H in Appendix B) shows the retention and graduation rates for undergraduate Biology majors from the 2007 cohort of FTIC and community college (CC) transfers through their fourth and sixth years.

Figure 5: 2007 Biology Cohort Graduation Rates.



We have chosen to plot the graduation rates of the 2007 cohort of FTICs and CC transfers because it is the most recent cohort on which there is six-year graduation rate data. As can be seen in Figure 5, 40-47% of both FTIC and CC transfer students take six years to graduate (assuming that CC transfers come to FAU with two years of school already).

xvi. Student recruitment –

Recruiting High School Students: The Jupiter campus has a strong recruiting program in the sciences targeted for high school students. For instance, the Tiger Woods Foundation STEM Career and College Conference was held in September 2014. A hands-on session was organized by the neuroscientists in the Department of Biological Sciences and provided an opportunity for middle and high school students and parents to participate in specialized instruction. More than 300 parents and students in grades 7-12 attended this free one-day conference.

High School Students Routinely Volunteer: Many of our laboratories in the Department of Biological Sciences, on every campus, routinely host high school student volunteers.

Phone Calls to Accepted Freshmen: In an effort to recruit successful students to FAU, all of the Biology faculty members took part in calling students that were admitted as FAU freshmen, but had not yet accepted, in August 2014.

The Annual Science Olympiad: Some of our faculty and graduate students participate in the Annual Science Olympiad that is hosted by the CESCOS. The event targets participant high schools with larger minority populations.

Clinic at Palm Beach State College: In October 2014, the Student Coordinator and a Student Advisor held an event for students who were interested in transferring into one of FAU's Biology programs either before or after completion of their A.A. or A.S. degree. The different undergraduate and graduate degree programs offered by the Department of Biological Sciences at FAU (including required coursework) were discussed with emphasis on the range of classes, research and professional development opportunities offered on the Jupiter Campus. In attendance were mostly college students, a dual-enrolled high school student and a few non-traditional/non-degree-seeking students. We have additional clinics scheduled for other state college campuses in the future.

Graduate Programs

Overview and assessment of the graduate programs

Masters. The Biological Sciences Department offers thesis and non-thesis M.S. degrees in both Biology and Environmental Sciences, M.S.T. and a recently introduced P.S.M. degree in Business Biotechnology. The programs are tailored to the needs and interests of the student, in multiple areas including Bacteriology, Cell Biology, Immunology, Molecular Genetics, Virology, Biotechnology, Microbiology, Anatomy and Development, Behavioral Biology, Ecology, Evolutionary Biology, Marine Biology, Environmental Sciences, Neuroscience, Physiology and Systematics. A Masters degree in biology prepares students for graduate study for the Ph.D. or health profession programs, teaching, research, or careers in business or government.

A thesis option is designed for students with career goals that include a research emphasis, such as the possibility of enrolling in a Ph.D. program. A non-thesis option is designed for students interested in the field of medicine, education at the elementary, middle and high school level, or those who simply wish to further their knowledge of biology. The M.S.T. is designed for graduate students who are interested in furthering their knowledge in biological sciences to pursue a career in teaching at various levels, including elementary, secondary, early childhood education and Community College. In 2011, the department started the P.S.M. program with the goal of placing graduating students into the biotechnology workforce.

Doctorate. Our IB Ph.D. Program was initiated in 2003 and has grown to a total of 60-70 students and has been stable at that number for five years. The first Ph.D. student graduated in 2007 and fifteen students graduated in 2012-13. The program was

designed primarily by the Departments of Biology and of Biomedical Science prior to the emergence of our independent Medical School. It was intended to be flexible and allow growth in various research areas. This flexibility has been utilized recently as we are in the process of establishing two concentrations within the IB Ph.D.: 1) IB-Neuroscience (IB-N) and 2) IB-Environmental Science (IB-ES). Recently, both concentrations were approved by the University Graduate Programs Committee and we are actively recruiting students.

The Department, with help from the Environmental Science Program, routinely assesses its seven graduate programs. The Masters degree with thesis is assessed for four learning outcomes that also address content, critical thinking, and communication. These outcomes are evaluated in graduate level classes, the research proposal, research thesis and oral presentation of the research. The Masters degree, non-thesis, is assessed for the same general learning outcomes. However, they are evaluated by both in-class work and a written/oral exit exam. The MST program has similar learning outcomes; they are assessed in class work. Certain classes incorporate oral presentation and significant term papers. The Masters students have met or exceeded the criteria set for success.

The IB Ph.D. Program is distributed between the CESCOS and the College of Medicine, with participation from the CMBB, HBOI, Torrey Pines Institute for Molecular Sciences (TPIMS), MPFI, the Scripps Research Institute, Florida and Vaccine and Gene Therapy Institute of Florida (VGTI). However, the IB Ph.D. Program is housed and assessed within Biological Sciences. As with the other programs described above it has four learning outcomes: 1) students will have mastered the content necessary for their progress and the skill of learning from the literature 2) they will be able to develop and test hypotheses 3) they will be able to communicate their results and 4) they will exhibit ethical conduct. These learning outcomes are assessed during the dissertation proposal and defense, both of which include written and oral components. The Assessment of Ph.D. Defense form and the Assessment of Ph.D. Proposal form are attached in Appendix A.

i. Limited access – Not applicable.

ii. Admissions criteria –
Incoming graduate students must meet admissions criteria established by the University as described in the University catalog:
http://www.fau.edu/academic/registrar/FAUcatalog/admissions.php

iii. Enrollment information –
Figure 6 shows the annual headcount since 2001 for all students in the Department of Biological Sciences. Data for this figure can be found in Table I of Appendix B. It is interesting that the number of graduate students has stopped growing. There may be a variety of reasons for this. The number of faculty has been constant over this period and this may limit the number of positions in labs. Since many of our students are local

Floridians, the graduate pool locally may be saturated and we need to recruit from outside southeast Florida.

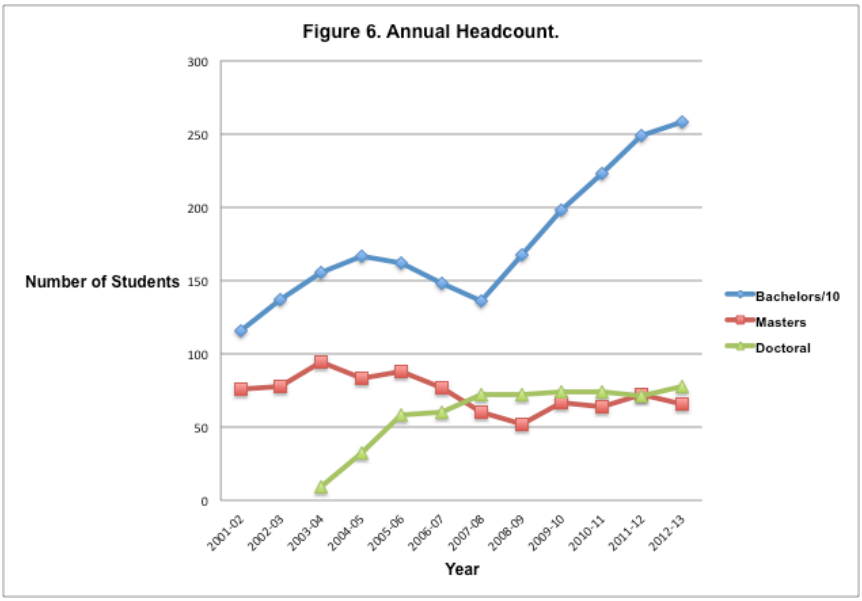
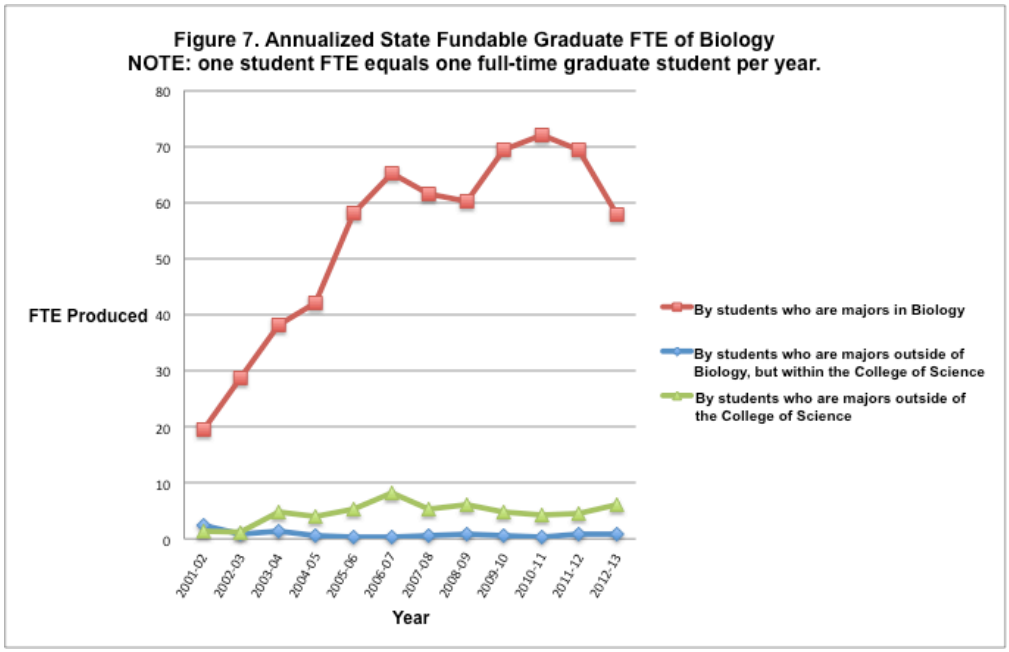


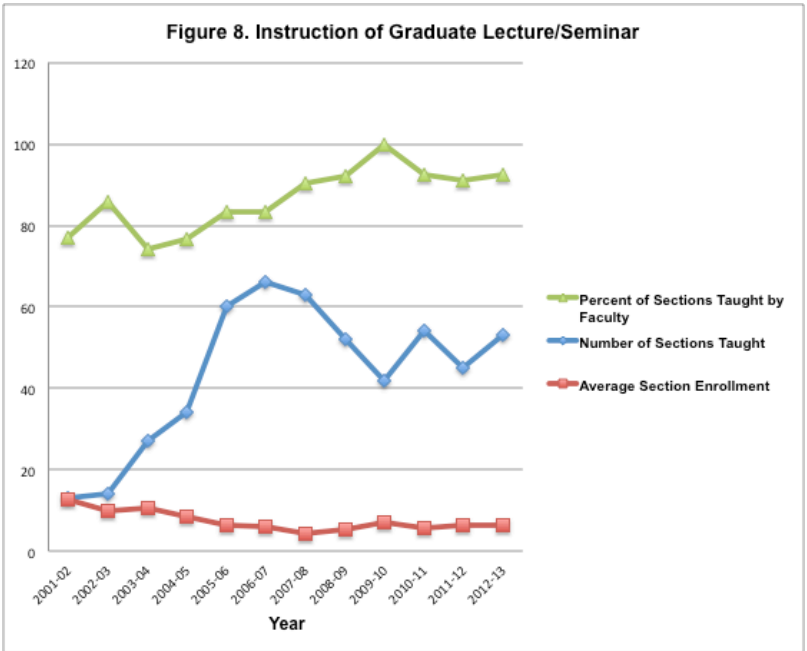
Figure 7 (Table J in Appendix B) details the annualized state fundable graduate FTE in/out of Biology or the CESCOS. It is clear that most of our effort goes into our own students. There is some service to majors outside of the CESCOS (green line in Figure 7) but this is a relatively small component.



iv. Average class size and faculty/student ratio

Table K in Appendix B lists the graduate average class size and Figure 8 plots the data below. The faculty/student ratio in lecture is approximately 1:15 and, in other course

types approximately 1:20. Over the past five years an average of 93.7% percent of our graduate lectures were taught by faculty members, with 92.5% of graduate lectures taught by faculty in 2012-2013. In other graduate course types, an average of 90.1% over the past five years, with 88% in 2012-2013 were taught by faculty.



v. Curriculum –

The Department of Biological Sciences offers thesis and non-thesis M.S. degrees in both Biology and Environmental Science, M.S.T. and a recently introduced P.S.M. degree in Business Biotechnology. The Curricula are listed in the university graduate catalog at the following site:
http://www.fau.edu/academic/registrar/FAUcatalog/science.php

Course work requirements

Doctoral degrees at FAU require at least 80 semester credits beyond the baccalaureate degree (a Masters degree is considered equivalent to 30 semester credits). The following are course requirements of the Integrative Biology Program: a minimum of 18 credits of course work with a cumulative grade point average of 3.0 or higher.

Required core courses

1) Integrative Biology I (BSC6390) (three credits): Through lectures, readings, journal club, classroom discussions and student papers, this course explores the idea of integrative biology and connectivity in biological systems. The course also provides an introduction to the IB program and the expectations of Ph.D. students. Integrative Biology 1 is offered only in the fall semester and must be taken within the first year.

2) One course in Biostatistics: A course in statistics appropriate to the area of specialization of the student (minimum three credits):

Experimental Design and Biometry (BSC 6206) (four credits)

Experimental Design 1 (PSY 6206) (four credits)

3) Scientific Communication (BSC 6846) (three credits): Introduces students to proposal writing and presentations for scientists.

Other course requirements for the doctoral degree

1) A minimum of three one-credit seminar/journal club courses over the entire term of residence in the program. Students are expected to give at least one presentation in one of the seminar/journal club courses.

2) A minimum of three elective courses, from the list of graduate courses in the CESCOS and the College of Medicine that are relevant to Integrative Biology. See for a list of potential courses is attached in Appendix A (from the Integrative Biology web page http://www.science.fau.edu/biology/intbio/course_selection.html). This list of elective courses is not exhaustive. The selection of elective courses to meet degree requirements will be determined by consultation between the student and the Ph.D. supervisor and/or the student's advisory committee. Other elective courses than those listed on the website may be chosen, but must be 5000, 6000, or 7000 level courses in biology, biomedical science, chemistry, or approved cognates. Courses designated as proficiency or remedial may not be used to satisfy the course requirements.

Other degree requirements

1) Research Credits:
   a) First and second semester: IB Lab Rotations (BSC 6905) when appropriate.
   b) After first/second semester but prior to candidacy: Advanced Research in Integrative Biology (BSC 7978)
   c) After attaining Candidacy: Dissertation Research Credits (BSC 7980). A minimum of 25 credits of doctoral dissertation research is required.

Preparation, presentation and defense of dissertation proposal

1) Written Dissertation proposal: The student shall submit a research proposal for review by the student's Dissertation Committee at least two weeks prior to the oral defense. Failure to do so may result in a delay of the oral defense. The proposal should be written in the format and structure using the IB guidelines and Proposal guidelines laid out in detail in ENC 6258 Scientific Communication course, unless the Dissertation Committee unanimously decides on another format. Finally, the student must seek guidance from his/her Ph.D. supervisor and/or other members of the Dissertation Committee with regard to the content of the proposal before submitting and defending it.

2) Oral Dissertation proposal defense: The student will be required to present and defend the research proposal in a meeting with the Dissertation Committee in which the student's proposed research and relevant scientific background will be explored in a comprehensive oral format.

3) Successful defense of the oral and written proposal shall qualify the student for candidacy, contingent upon satisfactory completion of the core and elective course

requirements. Students may propose and defend before completion of the course requirements, but formal advancement to candidacy will be delayed until the core course requirements are satisfied.

Dissertation research and defense of the dissertation
Dissertation research shall be conducted under the guidance of the student's Dissertation Committee. Students shall meet with the Ph.D. supervisor and other committee members on a regular basis (at least once a year) as the dissertation research proceeds. Students are expected to submit research findings for publication in scientific journals on a continuing basis. The student and the Ph.D. supervisor shall submit an annual research progress report approved by the dissertation committee via the program assistant to the director and associate directors at the end of each academic year. The IB Ph.D. Annual Research Progress Report is attached in Appendix A (and found on http://www.science.fau.edu/biology/intbio/form_download.htm). Without the annual research progress report a TA contract for the next semester will not be approved and students will not be allowed to register for any further course or research credits.

vi. Internships, practicum, study abroad, field experiences –
The FAU neuroscience group at Jupiter is forging alliances with Max Planck (MP) Institutes in Germany as well as with the local Max Planck Florida (MPFI). Two MP Institutes in Germany are working with FAU to develop international collaborations built around graduate students and postdocs who will work in exchange programs between the institutions. The initial contact was with the MP in Goettingen Germany where six Florida Faculty, three from MPFI and three from FAU visited the Georg August University in 2011 and learned how their program runs and explored ways to develop an international connection. One of our FAU students attended their short course in electrophysiology, attended a student-run international meeting and then returned to Florida where he served as TA for a new electrophysiology lab that we established. Again this year faculty members of FAU neuroscience attended the Horizons in Molecular Biology meeting (at The Max Planck Institute for Biophysical Chemistry) and two of the Ph.D. students attended the meeting and presented their work. Recently MPFI was awarded funds to establish an International Max Planck Research School (IMPRS) school in collaboration with FAU and the MPI in Bonn Germany. This program includes six FAU faculty members and the distribution of international students within the IB-N Program.

The P.S.M. degree in Business Biotechnology (with the goal of placing graduating students into the biotechnology workforce) places students in internships in biotech companies. More than 80% of the graduates were offered jobs while they were still in the internship or shortly after graduation. This success rate is as good or better than the national average for PSM graduates. The P.S.M. program enhances our collaborations with the local biotechnology industry.

The Environmental Science (ES) Program promotes internships for its students as a form of experiential learning where students learn by doing. South Florida is rich in

institutions involved in resource management and research so it is an ideal place to have students engaged in experiential learning as part of their academic studies. Internships are available for ES students at private consulting companies, state agencies (the South Florida Water Management District and the Florida Department of Environmental Protection), national agencies (US Environmental Protection Agency) and nearby parks and wildlife reserves (Everglades, state and local).

A new (summer 2014) study-abroad program is available to ES students. FAU recently concluded arrangements, originated by two members of the ES graduate faculty, in which the Tropical Forestry Research Institute (TFRI) in Guangzhou, China will provide funds for students to conduct a portion of their research at the TFRI. This collaboration will benefit students at FAU who are interested in mangrove ecology.

Field experiences are an important, but a small part of the ES curriculum. The courses take advantage of the varied environment around South Florida, from the Everglades to the ocean, and from estuaries to urban areas and most are in the Conservation and Ecology core subject area (examples of courses are Flora of South Florida, Marine Ecology, Marine Invertebrate Zoology and Natural History of the Indian River Lagoon).

vii. Pedagogy/pedagogical innovations –
Our graduate programs offer the students state-of-the-art innovative projects, which in turn allow the students to present at local, national and international conferences and to publish in peer-reviewed journals.

Both FAU undergraduate and graduate students have the opportunity to do research in the world-renowned institutes: Scripps Florida and MPFI. The sheer size of these institutes increases our ability to place students in research labs. It is worth noting that **nowhere else in the country is a university nestled amongst two renowned world-class research institutes**. FAU's unique physical location provides tremendous opportunities for STEM education and research training of all its students.

We have expanded our graduate course offerings to include several courses in Genetics, Development and Biotechnology. We are also expanding the neuroscience curriculum to include Advanced Neurophysiology (an intensive instrumentation course), Neuroanatomy, Practical Cell Neuroscience (based on Neurons in Action simulations) and Neurophysiology (with both wet and *in silico* labs). These four courses successfully run as special topics courses now and are pending approval to become formal graduate courses.

Video-conferencing rooms have been upgraded in the Department of Biological Sciences on all campuses. Upgrading these spaces greatly increases access to CESCOS coursework, scientific seminars (including graduate student seminars and advisory meetings) and other academic meetings allowing our students and faculty greater access to all campuses and other research institutes.

viii. Scope of institutional contributions –
The IB Ph.D. Program, based in the Department of Biological Sciences was jointly established between the CESCOS and the College of Medicine, with participation from the CMBB, HBOI, TPIMS, MPFI, Scripps, Florida and VGTI. As mentioned above this program has served as an effective platform to extend our graduate programs. The IB Ph.D. Program is being broadened by creating two research foci: one in Neuroscience (IB-N) and one in Environmental Science (IB-ES). These concentrations within IB are multi-college, multi-departmental and multi-institutional programs that benefit a larger community than just the Department of Biological Sciences (see Figure 7 above and Table J in Appendix B).

The IB program includes faculty and students in all of the Colleges and Institutes listed above. Additional faculty and students will enter from Scripps, Florida and MPFI for the IB-N degree, as well as, from the South Florida Water Management District, the USGS, Florida Fish and Wildlife and the US IFAS for the IB-ES degree.

Finally, the P.S.M. in Business Biotechnology Program requires students to take courses in both the CESCOS and the College of Business benefitting inter-college ties.

ix. Student profile –
Approximately 17% of the graduate students in Biology belong to underrepresented minority groups. This number continues to grow each year and we assume that it will eventually reach numbers similar to the undergraduate distribution of 45% underrepresented minorities. Table L in Appendix B shows the graduate student profile.

Departmental scholarships available to Biology graduate students are listed in Appendix A. There are multiple other scholarships available to graduate students through the Graduate College, the Alumni Association and directly through Financial Aid.

x. Advising procedures –
Supervisory committee (formed in the first semester of the first academic year)
The student's supervisory committee should be constituted before the end of the first semester; the chair of the committee shall be the Ph.D. supervisor of the student and constitute the supervisory committee in consultation with the student. For students without a Ph.D. supervisor, the Program Director or one of the Associate Directors will serve as a temporary chair until a Ph.D. supervisor is identified.

Identification of Ph.D. supervisor and research credits
Research conducted prior to candidacy:
1) All new incoming students (with the exceptions in #2 below) should register in the first semester for IB Lab Rotations BSC 6905. In the second semester students can either continue to do lab rotations until the end of the first calendar year, or can register for Advanced Research in Integrative Biology BSC 7978, with the approval of their identified Ph.D. supervisor.

2) Students who transfer from an FAU Masters with thesis program or who are being supported by RAs, and hence already have an identified Ph.D. supervisor, are not expected to rotate and can enroll for Advanced Research in Integrative Biology (BSC 7978) starting in the first semester.

Procedure for lab rotations and identification of the Ph.D. supervisor
Short-term laboratory rotations (three labs, each four weeks, first semester only) or long-term rotations (three to four labs, each eight weeks) over the first and second semester are an opportunity for faculty and students to meet without making a long-term commitment. Rotations allow the students to be exposed to a broader range of science, to network within the program, and to help the student make a well-informed choice of laboratory and the Ph.D. supervisor to conduct their thesis research. By trying out several laboratories, students can identify an area of research in which they are particularly interested, and a faculty member with whom they can develop a productive mentor-mentee relationship.

Students are encouraged to select a laboratory for their dissertation work by the beginning of their second semester but may continue to do rotations until end of the second semester. However, all students shall have an identified and approved Ph.D. supervisor at the latest by the end of the first academic year in the program.

Advancing to candidacy
Dissertation committee: (formed one semester before candidacy exam)
Once students have an identified Ph.D. supervisor they shall continue their course work as well as research by registering for Advanced Research in Integrative Biology BSC 7978. After a sufficient amount of research, as approved by their Ph.D. supervisor and/or supervisory committee, the student shall form their Dissertation Committee. The Dissertation Committee shall consist of four members, including the chair, whose responsibility is to guide the development of the dissertation research and administer the Dissertation Proposal review and Dissertation Defense.

xi. Licensure rates – Not applicable.

xii. Placement rates/employment profile –
Analysis of the 69 IB Ph.D. degrees awarded thus far show 41 alumni have pursued their careers at a University, either as postdoctoral fellows, adjunct faculty or non-tenure-track faulty or tenure-track faculty. These universities include: Indiana University/Purdue University, University of Michigan at Ann Arbor, Duke University, University of Florida, Texas A&M Health Science Center, Washington University School of Medicine, University of Tennessee Health Science Center, University of Illinois at Urbana, Johns Hopkins University, FAU, Wheaton College, Albert Einstein College of Medicine, University of Miami, Miller School of Medicine, Boston University, University of California at San Francisco and Stanford School of Medicine.

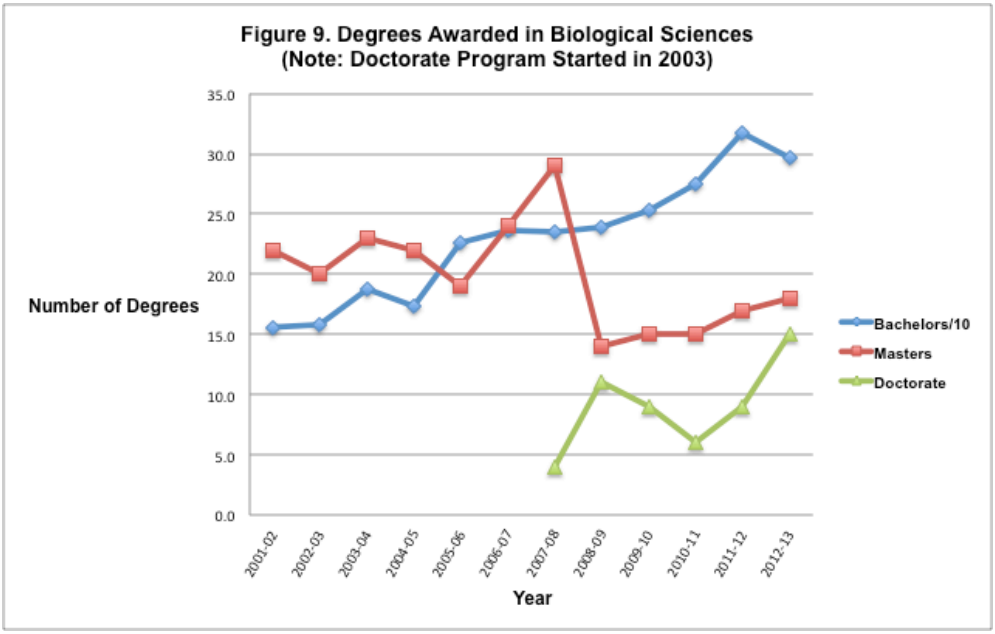
Eight alumni are/were postdoctoral fellows at research institutes in the region (Scripps, Florida, MPFI or VGTI). Two alumni are scientists at Pharmaceutical Companies (GlaxoSmithKline and Eli Lilly and Company).

Three alumni teach at the High School level. Other alumni are employed currently at various institutes including the USGS, Pacific Biodiversity Institute, EA Engineering, Integrated Health Care Associates, Teens4Oceans, Holy Cross Hospital, Nickel Producers Environmental Research Associates, Impact Medical Strategies, Institute for Regional Conservation and the Palm Beach Zoo. One of our most recent IB Ph.D. graduates has just started a science policy fellowship with the Congressional Black Caucus in Washington, D.C.

We don't have employment information for only six IB Ph.D. alumni.

xiii. Retention rates –
The total number of students that have been enrolled in the IB Ph.D. Program (i.e. accepted and attended) since its conception is 181. Sixty students are currently enrolled. Sixty-nine students have graduated with an IB Ph.D. from FAU. Currently enrolled and graduated students represent 71% of the total enrolled students. Fifty-two students have left the program without completing the Ph.D.

xiv. Graduation rates –
Tables 2 (above) and Table M (in Appendix B) from IEA show the data for Figure 9 below. A degree awarded with a single major contributes one degree, and a double major, contributes one-half degree. It can be seen from the data that M.S. degree-seeking student numbers dropped when the doctorate program started.



xv. Student recruitment –

IB Ph.D. Student Retreat: The 7th annual IB Ph.D. Student Retreat will take place in 2015. At the retreat, IB Ph.D. students showcase their research in a poster session. The retreat also gives prospective Ph.D. students the chance to tour the Boca campus and learn about the IB Ph.D. Program's research opportunities at the poster session. Every year a distinguished keynote speaker is invited; our speaker in 2015 will be Dr. Martin Chalfie, Nobel Laureate, and in 2014, it was Dr. Polly Matzinger, from the NIH, one of *Discover* magazine's Top 50 Most Important Women in Science. As part of recruitment, an IB alumnus is invited to the retreat and delivers a talk on what they learned during the IB Ph.D. Program, their success after completing the program and how the IB Ph.D. Program contributed to their success. The invited alumnus is awarded the "Distinguished Alumnus Award" based on outstanding contributions to the program. Alumni nominees for this honor are evaluated on the basis of their outstanding contributions to: 1) The IB Ph.D. Program (e.g. committee member, service to faculty or students), 2) Representation of the IB Ph.D. Program during their time in the program (e.g. invited talks, conferences, air-time on national TV), 3) Originality and creativity of their research (scope of the research project and techniques used to solve the problem), 4) Impact (significance in the field) and 5) Awards and funding received during their time in the IB Ph.D. Program. Honors undergraduate students and Masters students are invited to the retreat for recruitment purposes. Finally, the IB Ph.D. Retreat offers the opportunity to mingle with Ph.D. Program faculty, current students and the invited keynote speaker at a social mixer.

Our Graduate Program Coordinator and current graduate students hosted a biology graduate programs recruitment table at the 2014 Annual Graduate College Open House and will continue to do so here at FAU.

We submitted and were awarded a request for a $1,000 graduate recruitment grant and a $2,500 Provost's fellowship for the 2015-16 academic year from the FAU Graduate College. We have used previous recruitment grants to reimburse prospective students for travel to our annual recruitment event, the IB Ph.D. Student Retreat. The Provost's fellowship is meant to assist the program with recruitment by adding funds to the student assistantship (teaching or research) and increasing the program's appeal to incoming students.

We are expanding student recruitment for the Ph.D. Program to include popular scientific meetings. We hosted an IB-N recruitment table at the Society for Neuroscience (SfN) meeting (with over 31,000 attendees) in November 2014 in Washington, D.C. There were only 50 booths at the SfN Graduate Program Fair and many students stopped at our booth to discuss the program and its particulars. We handed out program brochures, a list of over 35 presentations by our IB-N faculty and students at the conference, pens and phone chargers with IB-N web sites and logos. We had two iPADs for students to input their data so that we may farther recruit interested students with more electronic information.

Our undergraduate Honors Program acts as a feeder to our graduate programs (as discussed in the "Undergraduate placement rates section" previously).

Academic clubs are always attractive to incoming students and thus serve as useful recruitment tools. The Association of Biological and Biomedical Students (ABBS) is run by our graduate students in Biological Sciences and the College of Medicine, and consists mostly of IB Ph.D. graduate students. ABBS hosts social mixers, seminars and workshops for students at both the undergraduate and graduate levels with the goal of getting students involved and has positively impacted recruitment for the IB Ph.D. Program.

The IB Ph.D. students are starting up a new club called the IB Club and will parallel the efforts of the ABBS club but focus more on IB Ph.D. students specifically. The IB Club also plans to have a stronger emphasis on professional development.

Faculty

i. Administrative structure -

The large size of the Department of Biological Sciences and the distributed nature of the campuses require considerable care in holding the pieces together. The overall strategy was designed to take advantage of the distributed campuses and make it a positive aspect of the department for both teaching and research.

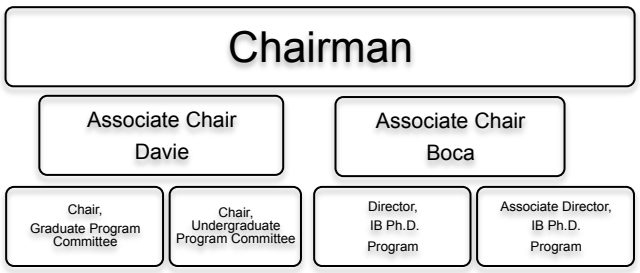
There are two Associate Chairs, one in Boca Raton and one in Davie. Dr. David Binninger, the Associate Chair in Boca Raton maintains and controls the course schedule, works with staff to assign teaching assistants to the laboratories and implements the assignments for the large teaching operation in Boca Raton. He also coordinates the course schedule and teaching assignments with Dr. Jay Lyons, the Associate Chair in Davie. The Boca Raton Associate Chair is also in charge of the molecular core facilities in Boca Raton and works with the Chairman to assign office, research and teaching space in Boca Raton.

Dr. Rod Murphey, the Chairman of Biology, speaks each morning with the Associate Chair in Davie to make sure that everyone is working toward the same goals. Since Davie ran relatively independently prior to Fall of 2000, and the Associate Chair guided the Davie operation, this has worked well to integrate the two parts of the Department. The Chairman and two Associate Chairs have worked together to increase the number of courses and the number of students using the Davie campus. We did this by taking advantage of the commuter campus and adding courses that are in heavy demand to the Davie campus; this has increased the number of seats from less than 100 per semester to more than 400 per semester in three years. The Associate Chair for Davie was also the point person for the new building and he coordinated the design and construction of the new Biology laboratories that moved to this new site.

In addition to the Associate Chairs, both the undergraduate program and the graduate program committees are chaired by another senior faculty member, Dr. Randy Brooks, who manages the programs and represents the Department of Biological Sciences on the College-Level Committees for graduate and undergraduate programs. Finally, the interdepartmental IB Ph.D. program is under the direction of both the Chairman of

Biology and Dr. Ken Dawson-Scully, Associate Director. Figure 10 is a schematic of the Department of Biological Science's administrative structure.

Figure 10. Administrative Structure of the Department of Biological Sciences.



ii. Faculty profile –
At the time of this writing in fall 2014 there are 28 faculty members in the Department: four Assistant Professors, thirteen Associate Professors, eleven Full Professors (two of the Full Professors are former administrators, M.J. Saunders, the former President and Brenda Claiborne, the former Provost, who have tenure positions in Biology and have returned to teaching this year). Nine of these faculty members are based primarily in Davie, thirteen are primarily in Boca, five primarily in Jupiter and one at HBOI in Fort Pierce. Finally, we have three Instructors who carry major teaching loads as lecturers and three full time staff who develop, maintain and operate the teaching labs. Including the Instructors, nine of these faculty members are women, three are black, four are Asian and one is Hispanic. Faculty diversity data can be found in Tables N1 and N2 in Appendix B and Table 3 below.

iii. Faculty teaching load –
The faculty teaching assignments for research active faculty are typically one large majors course (>100 students, some as large as 300) and one upper level undergraduate/graduate course. In addition, most research active faculty members mentor at least one graduate student and one undergraduate student (in our Research Experience for Undergraduates/Honors Programs). Figure 11 illustrates the workload for the Department as a whole. It shows a steady increase in FTEs doubling in the past decade. In contrast the number of faculty members has grown much more slowly, approximately 10%, for that same decade. Table 3 outlines teaching and academic responsibilities outside of research.

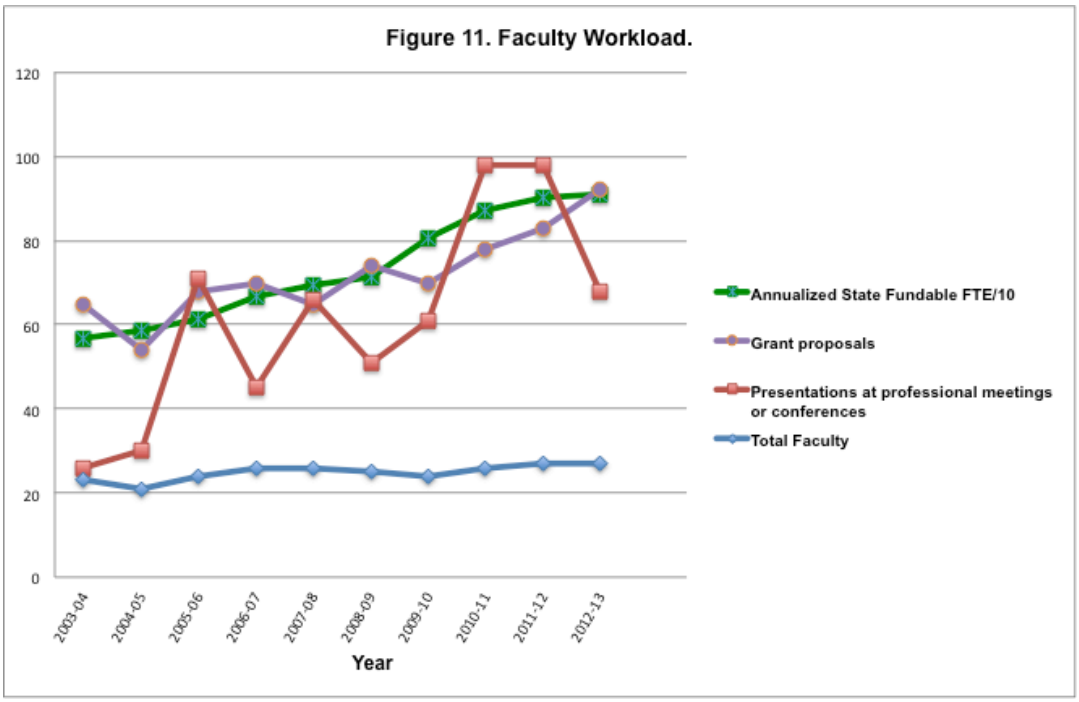


Table 3. Faculty Teaching And Academic Responsibilities For Academic Year 2012- 2013.

Biological Sciences	All	Under-represented minorities*	%	Women	%	TL**	UTA***	%	FD#	%	CC##	%
Tenure Track: Tenured & Non-Tenured	22	3	14%	5	23%	1.7	22	100%	3	14%	7	32%
Non-Tenure Track: Full Time	6	1	17%	3	50%	2.2	6	100%	3	50%	1	17%
Non-Tenure Track: Part Time	4	0	0%	1	25%	0.8	4	100%	0	0%	1	25%
Total Faculty	**32**	**4**	**0.1%**	**9**	**28%**	**N/A**	**32**	**100%**	**6**	**19%**	**9**	**28%**

* Underrepresented minorities: Black, African American, Hispanic, Latino/a, American Indian, Alaska Native, and Native Pacific Islander.
** Teaching Load (average per term)
*** Had an Undergraduate Teaching Assignment
# Participated in Faculty Development Activities (non-scientific research)
Participated in Undergraduate Curricular Changes

The FTEs produced per instructional person-year provides one measure of the teaching workload being carried by the average faculty member. The numbers are fairly

consistent across the CESCOS; in Biology the number is 15-16 FTE per person-year compared to 20 FTEs for the college as a whole (Table 4). However, these FTE numbers incorporate and thus are influenced by the number of graduate TAs in a given department.

If we adjust for the number of graduate TAs, then departments with large laboratory components and a large cadre of TAs (such as Psychology or Biology), increases by a factor of two-three fold and reaches 45 FTE per person-year. Such adjustments put the FTE production of a Biology faculty member in the top echelon of the institution.

Table 4. Annualized FTE Produced Per Instructional Person-Year.

	Biological Sciences			College Total	University Total
	2010-11	**2011-12**	**2012-13**	**2012-13**	**2012-13**
Undergraduate	14.1	14.5	15.1	19.4	19.1
Graduate	1.4	1.3	1.2	1.1	2.8
Total	**15.4**	**15.8**	**16.2**	**20.5**	**21.9**

Source: Instruction and Research File and Student Data Course File, IEA.
Includes Instructional Person-Years from all personnel categories.
Annualized FTE produced for each person-year devoted to instruction.

iv. Summary of faculty research productivity –
As Figure 11 and Tables O, P1 and P2 in Appendix B illustrate, research productivity has increased steadily over the last decade. The number of publications has more than doubled, as has the number of grant proposals submitted. In spite of the steady increase in grant proposals the number funded has decreased as the research funding agencies have tightened their criteria and the competition has become quite fierce. We have added patents and business funding to the departmental portfolio and one of the Jupiter biologists has funding from a Biotech company. The number of graduate students who support the research endeavor has nearly doubled in the past decade and the distribution has shifted from exclusively Masters students to a 50:50 split of M.S. and Ph.D. students as the IB Ph.D. program became established and grew to its present size of 60 to 70 students.

v. Strategic Planning for Hires –
The guiding principle is to hire faculty who will add to our research clusters and strengthen research groups while taking care of the teaching assignments. The faculty agreed as a whole to the most recent hires at a retreat two years ago. After a thorough discussion of the options the faculty decided the number one priority was a behavioral ecologist. We recently accomplished this goal with the hiring of a young behavioral ecologist, Dr. Rindy Anderson, who is an unusually good fit for the department as a whole. She will serve a number of constituencies, teaching in animal behavior, doing research in social behavior, sensory mechanisms and cognition and thereby making connections to all three research foci in the department. A second hire, Dr. Marianne Porter, is a biomechanics researcher. This second hire was a more opportunistic hire

and was part of a retention package. However, she fit the long-range plan established by the faculty and added nicely to our organismic group in Boca. Her research interests are making connections to the engineers among other interdisciplinary groups that have been lacking in our department. Finally, the administration has provided the resources to hire neuroscientists to the Jupiter wing of the department and we are trying to hire faculty who will complement the group in Jupiter as well as the other neuroscientists at MPFI and Scripps, Florida. We have hired one such faculty member in a joint hire with the Honors College, Dr. Greg Macleod. We are searching for mid-career faculty who are already funded and who will fit with the group in Jupiter.

D. Research

i. Review of part II of DDIs –

See "Summary of faculty research productivity" section above, Figure 11 above and Tables O, P1 and P2 in Appendix B.

ii. Interdisciplinary efforts and community engagement efforts –

Much of the Chairman's effort for the last 18 months has been focused on the Jupiter Life Science Initiative that was designed to establish strong links to Scripps, Florida and MPFI. We organized the move of six neuroscience faculty members (five from Biology and one from Psychology) and their associated personnel from Boca to Jupiter. The goal has been to establish research collaborations with the two institutes and enhance the overall neuroscience program on the MacArthur campus. This is working well and every FAU faculty member has one or more collaborations with a group or groups at one of the two research institutes. In addition, we established a neuroscience track within our IB Ph.D. program that includes faculty from FAU, Scripps, Florida and MPFI.

In parallel the Director of the Environmental Sciences program (a senior member of the Biology faculty, Dr. Dale Gawlik) led refinement of their Masters Program and has now added a track in the IB Ph.D. program. In addition, the Dean of the CESCOS has moved a free standing Center for Environmental Science from Jupiter to Davie further enhancing the Environmental emphasis. One example of the value of this interaction is a recent symposium initiated by CESCOS which brought together FAU Deans of Business, Education, Architecture, Science and Economics together with community leaders, researchers and educators concerning environmental issues to begin communication and outreach to increase the public awareness of environmental concerns and initiatives.

iii. Establishment of goals for research –

The research goals for the Department are pretty standard for a life science department – publish in high quality journals and succeed in the grant competition. In the long run we want the faculty to be successful at both grants and publications. This department has been relatively successful over the last decade as we have brought in young investigators who have succeeded because we chose good people, gave them the resources to succeed, monitored their progress carefully and mentored them as they moved toward tenure. In this decade all the junior faculty have succeeded in publishing regularly and obtaining grants as they proceed toward tenure and everyone we put up

for tenure has received tenure. A broad-based department like ours has to adjust for the history of its faculty as well as the aspirations of the department. The older faculty may make their contributions by mentoring the young faculty and taking on more of the teaching load.

iv. Assessment of how well the goals are being met –
Assessment is relatively straightforward because most faculty members know the rules and appreciate the standards toward which they are working. The tenure system at FAU has clearly tightened in this last decade and the rules are clear. Each of our new junior faculty has succeeded and has established their research projects, trained students, received grants and published their papers. My view is the goals are being met.

E. Service/Community Engagement
Table Q in Appendix B reviews Part II of the Department Dashboard Indicators for service and community engagement.

The Department of Biological Sciences has continued to show leadership in various community issues related to the Life Sciences through seminars, board membership, consultancy, applied research and mentoring. Dr. Nwadiuto Esiobu at the Davie Campus hosted a widely publicized and well-attended community forum entitled "Beyond Ebola: Building healthcare infrastructure in West Africa". Dr. M.J. Saunders serves on the task force for the FAU Chapter of the New Association for Women in Science. Dr. Esiobu, the founding Senior Vice President, crafts the strategic goals of the Palm Beach/Broward County Chapter of the US National Commission for UN Women. The leadership of the Biology faculty in their various professional organizations continues to build the Life Science enterprise in the nation and around the globe. These networks and strong commitment to the needs of the larger public make FAU even more relevant to the community while advancing the University's goals.

F. Other Department Goals
N/A

G. Strengths and Opportunities
The Department of Biological Sciences has an amazing set of opportunities, some scientific, some geographic, some political, and we are working to take advantage of them.

- In environmental science the natural environment and especially the Everglades and the marine environments are opportunities that our faculty routinely take advantage to enhance their research projects. The political and financial commitment to restoring the Everglades provides an amazing research resource that our faculty utilize to fund their research.
- In neuroscience, the state of Florida has invested nearly $1 billion in establishing Scripps, Florida Institute and MPFI on our MacArthur campus. The Department of Biological Sciences led the way in establishing connections to these institutes by moving the CMBB and a group of neuroscience faculty into a building on the MacArthur campus adjacent to Scripps and MPFI.

H. Weaknesses and Threats

- The distributed faculty between three main sites is a double-edged sword. It allows us to cluster faculty by common interests and common techniques, but it divides our relatively small faculty into even smaller groups.
- The distributed faculty also handicaps students from several perspectives. In some cases they must spend time and expense to travel in order to enroll in upper division and graduate courses, work in specific research laboratories and take advantage of university facilities and programs. We have made great strides at utilizing new technologies to broadcast courses and meetings to distributed sites, but still find many weaknesses in their application.
- Our ethnically diverse student body and urban campuses present unique problems in improving student retention. Most of our students are employed either full- or part-time in order to remain in college. It is difficult to significantly improve our retention rate in light of this situation. What programs can we facilitate to improve the rate of progress of our students through the program and their retention?

I. Resources

Further growth in enrollment and staff will require expansion of our current facilities. In Boca, although we have some limited faculty office and research laboratories available, our student laboratory and classroom space is practically exhausted. We are especially in need of large lecture facilities (enrollments in excess of 350) to present our undergraduate courses such as Life Science, Anatomy and Physiology, Genetics and Evolution. Our staff facilities in Davie and Jupiter are filled, as we have no more faculty offices or research laboratories at either site. We still have capability to expand our student laboratory offerings at both sites, however we also need more large classrooms (enrollments above 150 in Davie).

We are in need of an additional faculty line in the field of Aquatic Biology to add expertise in freshwater biology, limnology, fisheries science, and/or invasive species biology, which is of particular relevance to the Marine and Coastal Issues Signature Research Theme. The individual will complement existing expertise within the department and college, increasing the breadth of applicability to external funding sources as well as facilitating interdisciplinary research in the Environmental Sciences Program. Additionally, he/she will contribute to undergraduate instructional capacity by teaching an additional section of a high-enrollment upper-division course required for the Biology B.S. major (e.g., Principles of Ecology), enabling the department to keep pace with anticipated increases in enrollment in the major, as well as add breadth to graduate instruction through development of an advanced course in their area of expertise.

In order to grow the neuroscience group in Jupiter, we are recruiting mid-career faculty in cellular and molecular neuroscience. These faculty members will contribute to the growth and development of the new neuroscience focus at the MacArthur campus complementing the neuroscience groups at the Scripps Florida Institute and MPFI.

These people will enhance our reputation by bringing extramural funding to the campus as well as our ability to compete for umbrella grants in the field in joint grants with the two local research institutes. Finally they will contribute to the teaching mission at the undergraduate and graduate levels as well as providing mentoring for undergraduate and graduate students in the neurosciences.

The Department of Biological Sciences is extremely successful at engaging undergraduates in research experiences (refer to undergraduate pedagogy/pedagogical innovations section above). Research training of undergraduate students (in addition to our graduate students) poses high demands on Biology faculty time. We suggest that faculty should receive more credit for the training of undergraduate "directed independent studies" and relief from lecture courses.

A resource concern is the support staff in the Boca departmental office is understaffed or only employed part-time. We are currently recruiting additional support. In order to provide faculty their time in research, teaching and community engagement, support staff responsibilities might include: assisting in assembly of research proposals, manning our web sites, providing statistical support and helping with student support (funding and advising).

One of the main resource issues for the department is the limited support for graduate assistants. As Table 5 shows below, FAU is at the bottom of the ranking for MS stipends and health care. Only FIU pays a comparable stipend ($11,250 per nine months). Every other SUS institution surveyed pays a significantly larger stipend with UF paying double the salary for nine months. And every SUS institution surveyed pays most if not all of the student health care costs. Similar results are available for the Ph.D. students. These numbers can be directly linked to success in recruiting graduate students.

Table 5. Support For MS Students Across The SUS.

University	MS Stipend	Months	Tuition waiver	Health insurance
FAU	**9,636**	9	100% (in-state)	**No**
FIU	15,000	12	9 cr/sem.	75% of cost
USF	18,600	9	100%	100%
UF	18,000	9	100%	100%
FSU	20,000	12	100%	$900 supp.
UCF	10,000	9	100%	Y

J. Future Direction-Overall Vision for the Next Five to Ten Years

Three to five broad questions for the review team:

- How do we maximize our strong points yet prevent the department from fragmenting due to interest clusters as well as geographic clusters that tend to separate the interest groups? Clustering the faculty by interest enhances

intellectual cohesion but separates the various sub-groups of the department. How do we maintain cohesion?

- In keeping with President Kelly's plan to enhance STEM, particularly at the Jupiter campus, how can Biology enhance its cross-disciplinary efforts with other areas of science such as chemistry, psychology and math as well as engineering?
- Is our new "flexible curriculum" allowing students to customize their degree program towards a career goal? Early indications show very significant shifts in enrollment between the four required major courses.
- What programs can we establish to improve the retention rate of our uniquely diverse, urban and commuter student body?

K. Student Feedback

Similar to the lack of undergraduate student follow-up, FAU does not have an official procedure in place to collect this data for the graduate students. We surveyed IB Ph.D. graduate students and received nine responses. It became clear that the distance between the various campuses posed some difficulty, as well as the communication between the different parts of FAU and the graduate policy changes. This data is provided with the disclaimer that it may not be representative of all graduate students. The questions and graduate student responses are in Appendix A.

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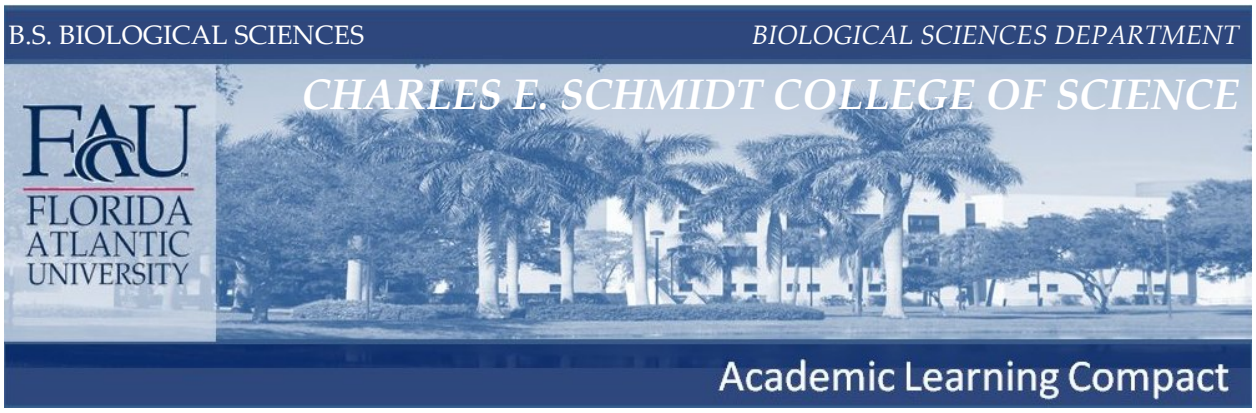
Appendix A. Supporting Documents.

Table of Contents



The principal mission of the Department of Biological Sciences is to train students for careers in biological sciences or pursue advanced training in graduate and professional schools. Through both education and research, our department seeks an increased appreciation and respect for our environment and awareness of the impact of our decisions on local, regional and global issues concerning the economy, personal health and welfare, and the environment.

CONTENT KNOWLEDGE (Declarative Knowledge): Students will demonstrate an understanding of cell structure, cell physiology and the molecular processes of cells. Students will be able to describe features that distinguish the major groups of organisms and the developmental and physiological mechanisms fundamental to all living organisms. Students will demonstrate an understanding of the principles of organismal genetics, evolution and ecology. Students receiving the BS degree in biological sciences are required to successfully complete the following core courses:

BSC 1010: Biological Principles

BSC 1011: Biodiversity

PCB 4023: Molecular and Cell Biology

PCB 4043: Principles of Ecology

PCB 3063: Genetics

Students' knowledge of the material will be assessed by examinations, typically using multiple-choice and short-answer questions. In upper division courses, examinations consist of advanced objective questions and high level problem solving.

CONTENT KNOWLEDGE (Technical Skills): Students will demonstrate proper laboratory practice, use of equipment, and ability to use basic and advanced techniques in several areas of biology.

CHARLES E. SCHMIDT COLLEGE OF SCIENCE

DEPARTMENT OF BIOLOGICAL SCIENCES

B.S. BIOLOGICAL SCIENCES

Students receiving a BS degree in biological sciences are required to successfully complete the following core laboratory courses:

BSC 1010L: Biological Principles Laboratory

BSC 1011L: Biodiversity Laboratory

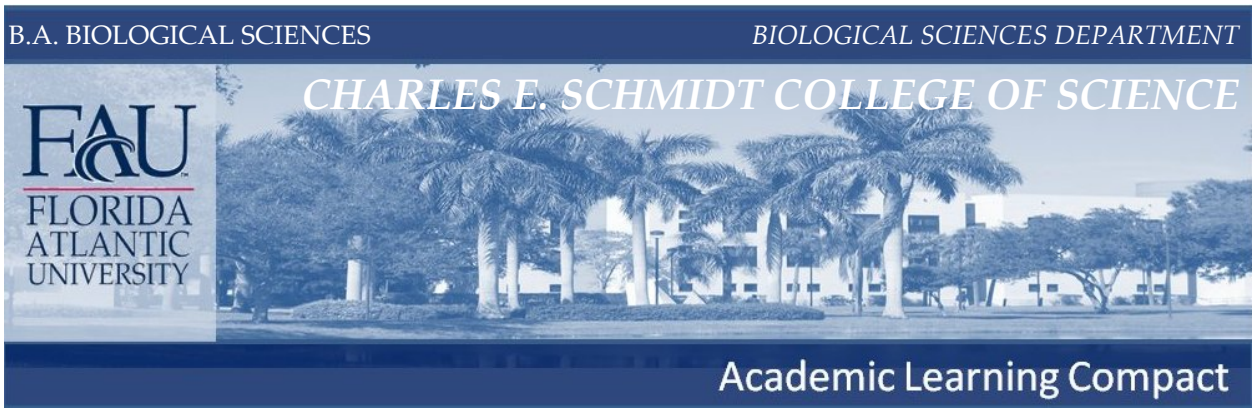
In BSC 1010L, students are tested on concepts by short answer and essay questions; in BSC 1011L, students are tested on their technical skills by practical examinations.

COMMUNICATION (Written Communication, Oral Communication): Students will demonstrate the ability to speak and write effectively on biological topics. BSC 1010L and BSC 1011L students are assigned to discussion groups of eight to ten students where they discuss course concepts and are evaluated for group participation. Students are tested for written communication skills by essay and short answer examinations.

CRITICAL THINKING (Analytical Skills): Students will use critical thinking to

evaluate data by applying basic principles of scientific methodology including (1) the nature of scientific explanations, (2) threats to the validity and reliability of observations, (3) the limitations of measurement scales, (4) using experimental and quasi-experimental designs to test hypotheses and (5) appropriate interpretation and correlation of experimental data.

COMPLETE BS DEGREE REQUIREMENTS APPEAR IN FAU'S UNIVERSITY CATALOG



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BSC 1010: Biological Principles

BSC 1011: Biodiversity

PCB 4043: Principles of Ecology

PCB 3063: Genetics

Students' knowledge of the material will be assessed by examinations, typically using multiple-choice and short-answer questions. In upper division courses, examinations consist of advanced objective questions and high level problem solving.

CONTENT KNOWLEDGE (Technical Skills): Students will demonstrate proper laboratory practice, use of equipment, and ability to use basic and advanced techniques in several areas of biology.

CHARLES E. SCHMIDT COLLEGE OF SCIENCE

DEPARTMENT OF BIOLOGICAL SCIENCES

B.A. BIOLOGICAL SCIENCES

Students receiving a BA degree in biological sciences are required to successfully complete the following core laboratory courses:

BSC 1010L: Biological Principles Laboratory

BSC 1011L: Biodiversity Laboratory

In BSC 1010L, students are tested on concepts by short answer and essay questions; in BSC 1011L, students are tested on their technical skills by practical examinations.

COMMUNICATION (Written Communication, Oral Communication): Students will demonstrate the ability to speak and write effectively on biological topics. BSC 1010L and BSC 1011L students are assigned to discussion groups of eight to ten students where they discuss course concepts and are evaluated for group participation. Students are tested for written communication skills by essay and short answer examinations.

CRITICAL THINKING (Analytical Skills): Students will use critical thinking to evaluate data by applying basic principles of scientific methodology including (1) the nature of scientific explanations, (2) threats to the validity and reliability of observations, (3) the

limitations of measurement scales, (4) using experimental and quasi-experimental designs to test hypotheses and (5) appropriate interpretation and correlation of experimental data.

COMPLETE BA DEGREE REQUIREMENTS APPEAR IN FAU'S UNIVERSITY CATALOG

FLORIDA ATLANTIC UNIVERSITY – INTELLECTUAL FOUNDATION PROGRAM 2014 - 2015

All courses are three (3) credits unless otherwise indicated. Course selections should be made in consultation with an academic advisor.

FOUNDATIONS OF WRITTEN COMMUNICATION

(Gordon Rule Writing (GRW), 6 credits required)
(A grade of "C" or higher is required in each course)

___ **ENC 1101** ..... **College Writing I (REQUIRED)**
___ ENC 1102**+** ..... College Writing II

THE FOLLOWING COURSES CAN BE SUBSTITUTED FOR ENC 1102:

___ ANT 1471**+** ..... Cultural Difference in a Globalized Society
___ ENC 1930**+** ..... University Honors Seminar in Writing **(Permit Only)**
___ ENC 1939**+** ..... Special Topic: College Writing II
___ HIS 2934**+** ..... Writing History
___ NSP 1195**+** ..... Being Cared For: Reflections from Other Side of Bed

Students must take four (4) GRW Courses.
Two (2) must be taken from Foundations of Written Communications. §

FOUNDATIONS OF SOCIETY & HUMAN BEHAVIOR

(6 credits required, select 2 courses from 2 different departments)

Anthropology Department
___ ANT 2000 **& D**.....Introduction to Anthropology

Economics Department
___ ECO 2013# .....Macroeconomic Principles
___ ECO 2023# .....Microeconomic Principles
___ ECP 2002.....Contemporary Economic Issues

Exceptional Student Education Department
___ EEX 2091.....Disability and Society

Geosciences Department
___ EVR 2017.....Environment and Society

Political Science Department
___ POS 2041 .....Government of the United States

Psychology Department
___ PSY 1012.....General Psychology

Public Administration Department
___ PAD 2258.....Changing Env. of Soc., Bus., & Government

Sociology Department
___ SYG 1000 .....Sociological Perspectives
___ SYG 2010 .....Social Problems

Urban & Regional Planning Department
___ URP 2051 .....Designing the City

FOUNDATIONS OF SCIENCE & THE NATURAL WORLD

(6 credits required, select 2 courses from 2 different departments)
(One (1) course must have a Lab)

---------- *For Non-Science Majors:* ----------

Anthropology Department
___ ANT 2511 **& L**..... Intro to Biological Anthropology (4 cr incl. Lab)

Biology Department
___ BSC 1005 **& L**..... Life Science (3 credits incl. Lab)

Chemistry Department
___ CHM 1020**C**..... Contemporary Chemical Issues
___ CHM 2083 **(P/F)**..... Chemistry in Modern Life **(Online Course)**

Engineering Dean Department
___ ETG 2831 ..... Nature: Inter. of Sc., Eng. and the Humanities

Geology Department
___ ESC 2070 ..... Blue Planet (**Online Course**)
___ GLY 2010**C** ..... Physical Geology (4 credits include lab)
___ GLY 2100..... History of Earth and Life
___ MET 2010 **& D** ..... Weather and Climate

Physics Department
___ AST 2002 **(P/F)**..... Introduction to Astronomy
___ PSC 2121 ..... Physical Science

---------- *For Science and/or Engineering Majors:* ----------

Biology Department
___ BSC 1010 **& L & D** ..... Biological Principles (4 cr. incl. Lab & Disc)
___ BSC 1011 **& L & D** ..... Biodiversity (4 cr. incl. Lab and Discussion)
___ BSC 2085 **& L*** ..... Anatomy & Physiology I (4 credits incl. Lab)

Chemistry Department
___ CHM 2032 **& L**..... Chemistry for Health Sciences (4 credits)
___ CHM 2045 **& L‡**..... General Chemistry I (4 credits Incl. Lab)

Physics Department
___ PHY 2043**** ..... Physics for Engineers I (3 credits)
___ PHY 2048 **& L**** ..... General Physics I (5 credits incl. Lab)
___ PHY 2053***** ..... College Physics I (4 credits)

FOUNDATIONS OF MATHEMATICS & QUANTITATIVE REASONING

(Grade of "C" or higher required. 6 credits required)
PRETEST IS REQUIRED BEFORE TAKING YOUR FIRST MATH CLASS
NOTE: Students must take at least one course with the prefix MAC or MGF from the list below

___ MGF 1106.....Math for Liberal Arts I
___ MGF 1107.....Math for Liberal Arts II
___ MAC 1105.....College Algebra
___ MAC 1114.....Trigonometry
___ MAC 1140.....Precalculus Algebra
___ MAC 1147.....Precalculus Algebra & Trigonometry (5 cr)
___ MAC 2233.....Methods of Calculus
___ MAC 2311.....Calculus with Analytic Geometry I (4 cr)
___ MAC 2312.....Calculus with Analytic Geometry II (4 cr)
___ STA 2023.....Introductory Statistics
___ PHI 2102.....Logic

FOUNDATIONS IN GLOBAL CITIZENSHIP

(Select 2 courses from 2 different departments) (6 cr. req.)
At least 1 course must be Global Perspectives – (GP)

Anthropology Department
___ ANT 2410 .....Culture and Society **(GP)**

Curriculum, Culture, & Educational Inquiry Department
___ EDF 2854 .....Educated Citizen in Global Context **(GP)**

Geography Department
___ GEA 2000 .....World Geography **(GP)**

History Department
___ AMH 2010 (P/F).....United States History to 1877
___ AMH 2020 (P/F).....United States History Since 1877
___ WOH 2012 & D++....History of Civilization I **(GRW) (GP)**
___ WOH 2022.....History of Civilization II **(GP)**

Languages, Linguistics, & Comparative Literature Department
___ LAS 2000.....Intro to Caribbean & Latin American Studies
___ LIN 2607 .....Global Perspectives on Language **(GP)**

Philosophy Department
___ PHI 2010 & D ++ .....Introduction to Philosophy **(GRW)**

Political Science Department
___ INR 2002 .....Introduction to World Politics **(GP)**

Sociology Department
___ SYD 2790 .....Race, Class, Gender, and Sexuality
___ SYP 2450 .....Global Society **(GP)**

Social Work Department
___ SOW 1005.....Global Perspectives of Social Services **(GP)**

FOUNDATIONS OF CREATIVE EXPRESSION

(6 credits req., select 2 courses from 2 different departments)

Architecture Department
___ ARC 2208.....Culture & Architecture

Visual Art & Art History Department
___ ARH 2000 **(P/F)**.....Art Appreciation

School of Communication & Multimedia Studies
___ FIL 2000 **& D**. .....Film Appreciation

English Department
___ LIT 2010**++** .....Interpretation of Fiction **(GRW)**
___ LIT 2030**++** .....Interpretation of Poetry **(GRW)**
___ LIT 2040**++** .....Interpretation of Drama **(GRW)**
___ LIT 2070**++** .....Interpretation of Creative Nonfiction **(GRW)**

Languages, Linguistics, & Comparative Literature Department
___ LIT 2100 .....Intro to World Literature

Music Department
___ MUL 2010 .....History & Appreciation of Music

Theatre & Dance Department
___ DAN 2100 .....Appreciation of Dance
___ THE 2000 .....Appreciation of Theatre

STUDENTS ASSUME RESPONSIBILITY FOR MEETING ALL GRADUATION REQUIREMENTS
Course selections should be made in consultation with an advisor

Legend

+ - ENC 1101 is a prerequisite.
++ - Two Foundations of Written Communications classes are required before taking this class.
# - Sophomore standing (30 credits earned) is required.
***** - Nursing majors are required to take this class in their first semester.
****** - MAC 2311 is a prerequisite for this class. If a lab is needed take General Physics 1 Lab (PHY 2048 Lab).
******* - MAC 1105 and MAC 1114 are prerequisites for this class. If a lab is needed take General Physics 1 Lab (PHY 2048 Lab).
‡ - Co-requisite of College Algebra (MAC 1105) or a prerequisite of Introductory Chemistry (CHM 1025).
¤ - College Algebra (MAC 1105) is a prerequisite for this class with a earned grade of "C" or better.
GRW - (WAC) Writing across the curriculum class.

§ Gordon Rule/Writing Across the Curriculum (WAC)

Students must attain grades of "C" or higher. 12 credits of writing (GRW) and 6 credits of mathematics are required.

Please note:
Students must take four (4) GRW courses. Two (2) courses are to be taken from Foundations of Written Communication. We strongly recommend the two additional GRW courses come from Foundations of Global Citizenship and/or Foundations of Creative Expressions. Courses include: PHI 2010, WOH 2012, LIT 2010, LIT 2030, LIT 2040 and LIT 2070. See advisor for additional details.

Elective Credits

The number of elective credits allowed varies by major. Please consult with an academic advisor to determine the number of elective credits required for your major. ***Certain majors do not allow any electives.***

(D) = Discussion, (L) = Lab

Courses indicating a (D) or (L) are linked with a lecture, a lab, and/or a discussion. If you select one of these courses, you must register for the lecture, lab, and/or discussion. You **must** attend the lecture, lab, and/or discussion.

Summer Credits

Students admitted to FAU as freshmen or who transfer with fewer than 60 credits must earn a minimum of 9 credits by attending one or more summer terms at either FAU or another university in the Florida State University System.

Florida Virtual Campus

Go to www.flvc.org to:

- Research majors and career options
- Submit an electronic **Transient Student Form***:
  - For instructions on how to complete the Transient Student Form please refer to the link available on the University Advising Services website.

***** Students who wish to take courses at another university or community college within the state of Florida must complete a Transient Student Form.

P/F

Certain designated undergraduate courses may be taken for a letter grade of pass (P) or fail (F). Students must indicate the grade option preferred when registering; otherwise, a letter grade will be given. The maximum credit available to any student on the P/F option is one course per term with a maximum of 12 credits during a student's entire course of study. This option is not available for courses in the student's major, for students on probation, or for **Engineering** majors.

Freshman Warning, Academic Probation, and Suspension

Students on freshman warning, academic probation, or suspension are required to meet with their academic advisor to discuss their academic status, and for special assistance in improving their academic performance.

Change of Major

Students who have earned fewer than 30 credit hours may change their major at any time at the Office of University Advising Services or at the Office of the Registrar. Students with 30 credit hours or more must go to their intended college or the Office of the Registrar. Changing the major requires permission from the new department. Students must satisfy the same academic qualifications as those for new applicants seeking admission to that department.

Transfer Credits

- **AP (Advanced Placement)**
- **IB (International Baccalaureate)**
- **CLEP (College Level Examination Program)**
- **High School Dual Enrollment**
- **AICE (Advance International Certificate in Education)**
- **Other University/College Transfer Credits**

Students should consult with an academic advisor to determine Florida Atlantic University Intellectual Foundation Program equivalency.

http://myfau.fau.edu

Go to MyFAU to:

- Check e-mail
- See FAU Announcements
- **FAU Self-Service:**
  - Course schedules
  - Registration (drop/add classes) and withdrawals
  - Student records and financial aid
  - Tuition payments
  - The University Course Catalog

FLORIDA ATLANTIC UNIVERSITY

All courses are three (3) credits unless otherwise indicated. Course selections should be made in consultation with an academic advisor.

BIOLOGY MAJOR
(2014 – 2015)

The Charles E. Schmidt College of Science
Bachelor of Arts (BA) and Bachelor of Science (BS)

FOUNDATIONS OF WRITTEN COMMUNICATION
(Gordon Rule Writing (GRW), 6 credits required)
(A grade of "C" or higher is required in each course)

___ **ENC 1101** ..... **College Writing I (REQUIRED)**
___ ENC 1102**+** ..... College Writing II

THE FOLLOWING COURSES CAN BE SUBSTITUTED FOR ENC 1102:

___ ANT 1471**+**..... Cultural Difference in a Globalized Society
___ ENC 1930**+** ..... University Honors Seminar in Writing **(Permit Only)**
___ ENC 1939**+** ..... Special Topic: College Writing II
___ HIS 2934**+**..... Writing History
___ NSP 1195**+** ..... Being Cared For: Reflections from Other Side of Bed

Students must take four (4) GRW Courses.
Two (2) must be taken from Foundations of Written Communications.
§Two additional courses are REQUIRED.

FOUNDATIONS OF SOCIETY & HUMAN BEHAVIOR
(6 credits required, select 2 courses from 2 different departments)

Anthropology Department
___ ANT 2000 **& D** .....Introduction to Anthropology

Economics Department
___ ECO 2013**#**.....Macroeconomic Principles
___ ECO 2023**#**.....Microeconomic Principles
___ ECP 2002 .....Contemporary Economic Issues

Exceptional Student Education Department
___ EEX 2091.....Disability and Society

Geosciences Department
___ EVR 2017 .....Environment and Society

Political Science Department
___ POS 2041 .....Government of the United States

Psychology Department
___ **PSY 1012**.....**General Psychology (REQUIRED)**

Public Administration Department
___ PAD 2258 .....Changing Env. of Soc., Bus., & Government

Sociology Department
___ SYG 1000 .....Sociological Perspectives
___ SYG 2010 .....Social Problems

Urban & Regional Planning Department
___ URP 2051 .....Designing the City

FOUNDATIONS OF SCIENCE & THE NATURAL WORLD
(8 credits req., select 2 courses from 2 different departments)
(All labs and discussions are required)
A grade of "C" or better is required in each class.

Biology Department
___ BSC 1011 **& L & D** ..... Biodiversity (4 cr. incl. Lab and Discussion)

Chemistry Department
___ CHM 2045 **& L‡**..... General Chemistry I (4 credits. Incl. Lab)

Additional Biology and Chemistry classes are needed.
Refer to the B.A. and B.S. sections of this curriculum sheet.

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FOUNDATIONS OF MATHEMATICS & QUANTITATIVE REASONING
(Grade of "C" or higher required. 6 credits required)
PRETEST IS REQUIRED BEFORE TAKING YOUR FIRST MATH CLASS
NOTE: Students must take at least one course with the prefix MAC from the list below

___ MAC 1105.....College Algebra
___ MAC 2233.....Methods of Calculus (or higher)
___ MAC 2311.....Calculus with Analytic Geometry I (4 cr)

Calculus with Analytic Geometry 1 requires a solid background in Algebra and Trigonometry. If you are not ready to take this course the following courses will provide the necessary background:

___ MAC 1114.....Trigonometry
___ MAC 1140.....Precalculus Algebra
___ MAC 1147.....Precalculus Algebra & Trigonometry (5 cr)

FOUNDATIONS IN GLOBAL CITIZENSHIP
(Select 2 courses from 2 different departments) (6 cr. req.)
At least 1 course must be Global Perspectives – (GP)

Anthropology Department
___ ANT 2410 .....Culture and Society **(GP)**

Curriculum, Culture, & Educational Inquiry Department
___ EDF 2854 .....Educated Citizen in Global Context **(GP)**

Geography Department
___ GEA 2000 .....World Geography **(GP)**

History Department
___ AMH 2010 (P/F).....United States History to 1877
___ AMH 2020 (P/F).....United States History Since 1877
___ WOH 2012 & D++....History of Civilization I **(GRW) (GP)**
___ WOH 2022.....History of Civilization II **(GP)**

Languages, Linguistics, & Comparative Literature Department
___ LAS 2000.....Intro to Caribbean & Latin American Studies
___ LIN 2607 .....Global Perspectives on Language **(GP)**

Philosophy Department
___ PHI 2010 & D++ .....Introduction to Philosophy **(GRW)**

Political Science Department
___ INR 2002 .....Introduction to World Politics **(GP)**

Sociology Department
___ SYD 2790 .....Race, Class, Gender, and Sexuality
___ SYP 2450 .....Global Society **(GP)**

Social Work Department
___ SOW 1005.....Global Perspectives of Social Services **(GP)**

FOUNDATIONS OF CREATIVE EXPRESSION
(6 credits req., select 2 courses from 2 different departments)

Architecture Department
___ ARC 2208 .....Culture & Architecture

Visual Art & Art History Department
___ ARH 2000 **(P/F)**.....Art Appreciation

School of Communication & Multimedia Studies
___ FIL 2000 **& D**. .....Film Appreciation

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___ LIT 2030**++** .....Interpretation of Poetry **(GRW)**
___ LIT 2040**++** .....Interpretation of Drama **(GRW)**
___ LIT 2070**++** .....Interpretation of Creative Nonfiction **(GRW)**

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___ MUL 2010 .....History & Appreciation of Music

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___ DAN 2100 .....Appreciation of Dance
___ THE 2000 .....Appreciation of Theatre

STUDENTS ASSUME RESPONSIBILITY FOR MEETING ALL GRADUATION REQUIREMENTS
Course selections should be made in consultation with an advisor

Legend

+	- ENC 1101 is a prerequisite.
++	- Two Foundations of Written Communications classes are required before taking this class.
#	- Sophomore standing (30 credits earned) is required.
******	- MAC 2311 is a prerequisite for this class. If a lab is needed take General Physics 1 Lab (PHY 2048 Lab).
*******	- MAC 1105 and MAC 1114 are prerequisites for this class. If a lab is needed take General Physics 1 Lab (PHY 2048 Lab).
‡	- A corequisite of College Algebra (MAC 1105) or a prerequisite of Introductory Chemistry (CHM 1025).
GRW	- (WAC) Writing across the curriculum class.
D	- A discussion may be linked to the lecture. Students must register for the discussion in addition to the lecture.
L	- A lab is linked to the lecture. Students must register for the lab in addition to the lecture.
P/F	- Course may be taken pass (P) or fail (F) or for a letter grade. Indicate your preferred grading option during registration.
§	- We strongly recommend the two additional GRW courses come from Foundations of Global Citizenship and/or Foundations of Creative Expressions. Courses include: PHI 2010, WOH 2012, LIT 2010, LIT 2030, LIT 2040, & LIT 2070. See advisor for additional details.

FOREIGN LANGUAGE (4 - 8 credits, 1 or more courses in the same language) - **REQUIRED FOR MAJOR**
Students with more than one year of a foreign language in high school should enroll in the second half of the beginners foreign language class (ARA/CHI/FRE/GER/HBR/ITA/JPN/LAT/SPN 1121) or a higher level course. Proficiency for a first-level course can be earned by successfully completing a second-level course. For questions related to this requirement, consult an academic advisor. CLEP exam credits meet this requirement: see the catalog.

 NOTE: *Native Speakers of a foreign language must consult the Languages, Linguistics, and Comparative Literature Department regarding this requirement.*

 NOTE: *Honors Seminars SHALL BE ACCEPTED AS MEETING THE GORDON RULE WRITING REQUIREMENT. See the University Advising Services Office for details.*

 HONORS NOTE: *Students can apply for the PSYCHOLOGY HONORS PROGRAM after completion of 60 credits, and before completion of 105 credits. Students must have a 3.2 overall & Psychology GPA to be admitted and retained in the Honors track.*

NOTE: See catalog for specific requirements, course descriptions, and additional information. The requirements for some Intellectual Foundations Program (I.F.P.) courses & other courses may be satisfied by passing the appropriate AP or CLEP exam. Check with your advisor and college.

The Charles E. Schmidt College of Science has the following requirements:

(1) A student must maintain a "C-" average or better in all biology AND cognate courses taken as part of the requirements for an undergraduate degree in Biological Sciences. However, students must maintain a "C" average in chemistry courses.

(2) Any course work in the major field transferred from another institution must be approved by the major dept.

(3) No major course may be taken pass/fail.

(4) The maximum amount of credit which may be earned through co-op is 10 credits; some departments allow some of these credits to substitute for major courses, check with department for specifics.

MAJOR COURSES, COLLEGE REQUIREMENTS and ELECTIVES
B.A. DEGREE

Required Courses (Biology Core): 40 - 41 credits:

BSC 1011 & L	Biodiversity and Lab	4 cr – **as indicated on first page**
BSC 1010 & L	Biological Principles and Lab	4 cr

(BSC 1011 & BSC 1010 also require a discussion)

CHM 2045 & L[1]	General Chemistry I and Lab	4 cr – **as indicated on first page**
CHM 2046 & L[1]	General Chemistry II and Lab	4 cr
CHM 2210 & D[1]	Organic Chemistry I	3 cr
CHM 2211[1]	Organic Chemistry II	3 cr
PSC 2121	Physical Science	3 cr

[1]Chemistry courses require a "C" or better

OR	MAC 2233	Methods of Calculus	3 cr
	MAC 2311	Calculus w/Analytic Geometry	4 cr
OR	STA 3173	Introduction to Biostatistics	3 cr (**prerequisite MAC 2233**)
	PSY 3234	Exp. Design & Stat. Inference	3 cr

Select at least three (3) of the courses below (the other course may be used as an elective): 9 – 10 credits

PCB 3063	Genetics	4 cr
PCB 4023	Molecular and Cell Biology	3 cr (**prerequisite BCH 3033**)
PCB 4043	Principles of Ecology	3 cr
PCB 4674	Evolution	3 cr

*** BCH 3033 (Biochemistry I) is a prerequisite and can serve as an elective.

Biology electives (select 15 credits): Please note you must have course prerequisite(s) completed

BCH 3033 Biochemistry 1	3 cr	OCB 4032 & 4032L Marine Biodiversity and Lab	4 cr
BOT 3223 & 3223L Vascular Plant Anatomy & Lab	4 cr	OCB 4043 & 4043L Marine Biology and Lab	4 cr
BOT 4404 & 4404L Marine Botany & Lab	4 cr	OCB 4525 & 4525L Marine Microbiology & Molecular Bio & Lab	4 cr
BOT 4503 & 4503L Principles of Plant Physiology & Lab	4 cr	OCB 4633 & 4633L Marine Ecology & Lab	4 cr
BOT 4713 & 4713L Plant Taxonomy & Lab	4 cr	OCE 4006 Marine Science	4 cr
BOT 4734C Plant Biotechnology	3 cr	PCB 3352 Issues in Human Ecology	3 cr
BSC 4403L Biotechnology 1 Lab	2 cr	PCB 3703 & 3703L Human Morph. & Function 1 & Lab	4 cr
BSC 4427L Biotechnology 2 Lab	2 cr	PCB 3704 & 3704L Human Morph. & Function 2 & Lab **or**	4 cr
BSC 4806 Biology of Cancer	3 cr	PCB 4233 Immunology	3 cr
BSC 4905 Directed Independent Study	1-3 cr	PCB 4522 Molecular Genetics	4 cr
BSC 4917 Honors Thesis Research 1	3 cr	PCB 4723 & 4723L Comparative Animal Physiology & Lab	4 cr
BSC 4918 Honors Thesis Research 2	3 cr	PCB 4803 Reproductive Endocrinology	3 cr
BSC 4930 Special Topics: (Model Systems Genetics Lab)	3 cr	PCB 4842 Cellular Neuroscience & Disease	3 cr
CHM 2211L Organic Chemistry Lab	2 cr	PCB 4843C Practical Cell Neuroscience	3 cr
MCB 3020 & 3020L General Microbiology & Lab	3 cr	ZOO 2203 & 2203L Invertebrate Zoology & Lab	5 cr
MCB 4203 Medical Bacteriology	3 cr	ZOO 4472 & 4472L Ornithology & Lab	4 cr
MCB 4603 Microbial Ecology	3 cr	ZOO 4402 & 4402L Functional Bio of Marine Animals & Lab	4 cr
		ZOO 4690 & 4690L Comparative Vertebrate Morph & Lab	5 cr

31 – 35 credits	Intellectual Foundations Program and Foreign Language
40 – 41 credits	Biology Core
15 credits	Biology Electives
29 – 34 credits	Free Electives – (**17 – 20 credits must be upper-division**)
120 CREDITS	**TOTAL (45 credits at upper division minimum)**

B.S. DEGREE

Required Courses (Biology Core): 47 - 48 credits

	BSC 1011 & L	Biodiversity and Lab	4 cr – **as indicated on first page**
	BSC 1010 & L	Biological Principles and Lab	4 cr
	(BSC 1011 & BSC 1010 also require a discussion)		
	CHM 2045 & L[1]	General Chemistry I and Lab	4 cr – **as indicated on first page**
	CHM 2046 & L	General Chemistry II and Lab	4 cr
	CHM 2210 & D	Organic Chemistry I[1]	3 cr
	CHM 2211	Organic Chemistry II[1]	3 cr
OR	MAC 2233	Methods of Calculus	3 cr
	MAC 2311	Calculus w/Analytic Geometry	4 cr
	PHY 2053	College Physics I[2]	4 cr (**prerequisite MAC 2233**)
	PHY 2048L	General Physics I Lab	1 cr
OR			
	PHY 2048	General Physics I[3]	4 cr (**prerequisite MAC 2311**)
	PHY 2048L	General Physics I Lab	1 cr
	PHY 2054	College Physics II	4 cr
	PHY 2049L	General Physics II Lab	1 cr
OR			
	PHY 2049	General Physics II	4 cr
	PHY 2049L	General Physics II Lab	1 cr
OR	STA 3173	Introduction to Biostatistics	3 cr (**prerequisite MAC 2233**)
	PSY 3234	Exp. Design & Stat. Inference	3 cr

[1]Chemistry courses require a "C" or better
[2]Prerequisite of a "C" in one these math courses: MAC 1114 / 1147 / 2233 / 2311
[3]Prerequisite of a "C" in MAC 2311

Select at least three (3) of the courses below (the other course may be used as an elective): 9 – 10 credits

PCB 3063	Genetics	4 credits
PCB 4023	Molecular and Cell Biology	3 credits
PCB 4043	Principles of Ecology	3 credits
PCB 4674	Evolution	3 credits

Electives: (select at least 21 credits from the list below): Please note you must have course prerequisite(s) completed

BCH 3033	Biochemistry 1	3 cr	
BOT 3223 & 3223L	Vascular Plant Anatomy & Lab	4 cr	
BOT 4404 & 4404L	Marine Botany & Lab	4 cr	
BOT 4503 & 4503L	Principles of Plant Physiology & Lab	4 cr	
BOT 4713 & 4713L	Plant Taxonomy & Lab	4 cr	
BOT 4734C	Plant Biotechnology	3 cr	
BSC 4403L	Biotechnology 1 Lab	2 cr	
BSC 4427L	Biotechnology 2 Lab	2 cr	
BSC 4806	Biology of Cancer	3 cr	
BSC 4905	Directed Independent Study	1-3 cr	
BSC 4917	Honors Thesis Research 1	3 cr	
BSC 4918	Honors Thesis Research 2	3 cr	
BSC 4930	Special Topics: (Model Systems Genetics Lab)	3 cr	
CHM 2211L	Organic Chemistry Lab	2 cr	
MCB 3020 & 3020L	General Microbiology & Lab	3 cr	
MCB 4203	Medical Bacteriology	3 cr	
MCB 4603	Microbial Ecology	3 cr	
OCB 4032 & 4032L	Marine Biodiversity and Lab	4 cr	
OCB 4043 & 4043L	Marine Biology and Lab	4 cr	
OCB 4525 & 4525L	Marine Microbiology & Molecular Bio & Lab	4 cr	
OCB 4633 & 4633L	Marine Ecology & Lab	4 cr	
OCE 4006	Marine Science	4 cr	
PCB 3352	Issues in Human Ecology	3 cr	
PCB 3703 & 3703L	Human Morph. & Function 1 & Lab	4 cr	
PCB 3704 & 3704L	Human Morph. & Function 2 & Lab **or**	4 cr	
PCB 4233	Immunology	3 cr	
PCB 4522	Molecular Genetics	4 cr	
PCB 4723 & 4723L	Comparative Animal Physiology & Lab	4 cr	
PCB 4803	Reproductive Endocrinology	3 cr	
PCB 4842	Cellular Neuroscience & Disease	3 cr	
PCB 4843C	Practical Cell Neuroscience	3 cr	
ZOO 2203 & 2203L	Invertebrate Zoology & Lab	5 cr	
ZOO 4472 & 4472L	Ornithology & Lab	4 cr	
ZOO 4402 & 4402L	Functional Bio of Marine Animals & Lab	4 cr	
ZOO 4690 & 4690L	Comparative Vertebrate Morph & Lab	5 cr	

31 – 35 credits	Intellectual Foundations Program and Foreign Language
47 – 48 credits	Biology Core
21 credits	Biology Electives
17 – 20 credits	Free Electives – (**11 – 14 credits must be upper-division**)
120 CREDITS	**TOTAL (45 credits at upper division minimum)**

Undergraduate Scholarships:

Scholarships available to incoming freshmen from FAU's Office of Undergraduate Admissions include:

- FAU Presidential Scholarship: $24,000. Awards of $6,000 per year for first-time-in-college (FTIC) freshmen. Renewable up to four years based on academic achievement.
- Spirit of FAU: $20,000. Awards of $5,000 per year for FTIC freshmen. Renewable up to four years based on academic achievement.
- Elite Owl Scholarship: $12,000. Awards of $3,000 per year for FTIC freshmen. Renewable up to four years based on academic achievement.
- Welcome to FAU Scholarship: $1,000. Limited awards of $1,000 ($500 per semester for the fall and spring of the student's first year) are available for freshmen entering FAU as full-time students in the fall semester. This is a non-renewable award. A scholarship application is not required for this award as a students' eligibility is determined when an undergraduate application and supporting documents are reviewed for admission. The award is based on the competitive level of the pool of applicants.
- Academic Excellence Award (AEA): Awards of approximately $1,475, per semester are given in the form of non-resident tuition waiver for three credit hours. Scholarships are awarded to students who are classified as Non-Florida resident for tuition purposes.

Scholarships available to transfer students from FAU's Office of Undergraduate Admissions include:

- Honors/Phi Theta Kappa Scholarship: $3,200 per year for incoming junior transfer students with a minimum 3.5 GPA.
- Community College Scholars Award: Scholarships of $3,000 per year for incoming transfer students from one of Florida's College System institutions.
- All Academic Team Scholar: Awards of $3,000 per year to members of the Florida College System All-Academic Team.
- Transfer Educational Achievement Award (TEAA): Awards of $3,000 per year available for incoming junior transfer students from one of Florida's College System institutions.
- Brain Bowl: Awards of $2,250 per year for students on the winning brain bowl team.
- Depan International Transfer Student Scholarship: $2,000 per year for a student transferring to FAU on a student or scholar visa.
- Depan Transfer Scholarship Indian River Community College: An award of $2,000 per year, renewable up to two years, is offered to students transferring to FAU from Indian River State College.
- M. Brenn Green Scholarship: Awards of $1,000 per year, available for undergraduate transfer students majoring in one of the following areas: anthropology, criminal justice, economics, geography, health administration, political science, social work or sociology.
- Broward College International Center Graduates Transfer Award: International

graduates of the Associate of Arts (AA) or articulated Associate of Science (AS) degrees received at Broward College International Centers who apply to continue their education at Florida Atlantic University towards a bachelor degree, may also apply for a transfer award from FAU.

- Welcome to FAU Transfer Scholarship: Awards of $1,000 ($500 per semester for the fall and the spring of the student's first year) are available for transfer students entering FAU as full-time students in the fall semester.

International Student Scholarships are also available from FAU's Office of Undergraduate Admissions including:

- Depan International Freshman Student Scholarship: $8,000. $2,000 awarded annually over eight consecutive semesters for a freshman student on a student or scholar visa.
- Depan International Transfer Student Scholarship: $4,000. $ 2,000 awarded annually over four semesters for a transfer student on a student or scholar visa.
- International Scholarship For Non-Resident Freshman Students: A limited number of scholarships of approximately $1,438 per semester are given in the form of a non-resident tuition waiver for three credit hours to cover the cost of out-of-state tuition.
- Florida Linkage Institutes Tuition Waiver Awards (for students from specific countries and/or regions): Florida Statute 288.9175 established Linkage Institutes between postsecondary institutions in the state of Florida and foreign countries.

Scholarships available to undergraduate biology alumni from FAU's Alumni Association include:

- Hall of Fame Award.
- Distinguished Alumni of the Colleges.
- Outstanding Young Owls.
- Alumni Talon Award and Parliament of OWLS.
- Degree of Difference Award.

Integrative Biology PhD program, assessment of PhD Defense.

Date:

Name of Student: _____
Name of Evaluator: _____
Evaluators Field of Study: _____

Please evaluate this PhD proposal, giving a score of 1 to 5 with 5 being highest, so that the Integrative Biology PhD program can assess quality. Use a zero, 0, if you feel unqualified to judge a particular criterion. In grey below, some adjectives are presented which describe mediocrity versus excellence to guide scoring.

Breadth of knowledge of the field Shallow and mistaken or commanding with deep understanding of theory?	
Originality of research Unoriginal, or novel and exciting?	
Scope of research Narrow or ambitious?	
Research approaches and methods Contains mistakes or brilliant and elegant?	
Scope and quality of data and analyses presented Missing, or rich and persuasive?	
Strength of conclusions Unsupported, or thoughtful?	
Significance of research Will make no contribution, or with exciting applications?	
Quality of presentation Sloppy, or clear and engaging?	
Quality of written thesis.	
Students response to questions and criticisms Confused, or able to respond appropriately, present counter arguments?	
Overall evaluation Has student demonstrated ability to be an independent scientist?	

Other comments:

Integrative Biology PhD program, assessment of PhD proposal.

Date:

Name of Student: _____
Name of Evaluator: _____
Evaluators Field of Study: _____

Please evaluate this PhD Proposal Defense, giving a score of 1 to 5 with 5 being highest, so that the Integrative Biology PhD program can assess quality. Use a zero, 0, if you feel unqualified to judge a particular criterion. In grey below, some adjectives are presented which describe mediocrity versus excellence to guide scoring.

Exposition and analysis of literature in the field Shallow and mistaken or commanding with deep understanding of theory?	
Development of research questions Faulty logic and missing theory, or creative and sophisticated?	
Originality of research question Unoriginal, or novel and exciting?	
Scope of research Narrow or ambitious?	
Significance of research question Trivial, or brilliant with exciting implications?	
Research approaches and methods Contains mistakes or brilliant and elegant?	
Scope and quality of preliminary data Missing, or persuasive regarding feasibility of study?	
Quality of data analyses proposed Missing, mistaken, or novel and thorough?	
Quality of Presentation Sloppy, or clear and engaging?	
Overall evaluation. Has student developed a project suitable for dissertation research?	

Other comments:

IB Ph.D. Electives

Conservation Biology

Advanced Ecology (PCB 6046)
Provides graduate students with a background in development of ecology as a science and current ecological theory and application of ecology for ecosystems management.

Ecological Modelling (EVR 6029)
The course gives an overview of modeling and simulation techniques, with particular emphasis on applications in environmental science.

Ecological Theory (PCB 6406)
A functional approach to and a critical examination of the principles and concepts in ecosystem theory.

Ecosystems-S. Florida (BSC 6936)
Examine in detail the Ecosystems of South Florida, both through classroom and field activities. Ecosystem structure and function using comparisons of the historical and current landscape of South Florida and link content to the Comprehensive Everglades Restoration Plan."

Environmental Physiology (BSC 6936)
This class examines how animals function and respond to their natural environments, with reflections on behavioral strategies, ecology, evolution, and physiology. The initial part of the course looks at general adaptations to specific challenges faced by animals in different environments, the second part of the class examines how animals adapt to specific environments (e.g. desert, polar).

Marine Ecology (PCB 6317)
A study of the principles, concepts, and techniques of marine and estuarine ecology. Environmental factors, adaptations, habitats, communities, and applications of current ecological theory and studied. Lecture, laboratory, and fieldwork are included.

Symbiosis (BSC 6365)
Introduces concepts of symbiosis and the role of such associations in the evolution, coevolution, and ecology or organisms.

MARINE BIOLOGY

Advanced Marine Mammal Biology & Medicine (BSC 6936)
Course provides advanced level coverage of marine mammal: biology and adaptive physiology, health assessment studies, genetics, photo-identification and monitoring, behavior research, emerging diseases, stranding and rehabilitation husbandry, necropsy procedures and terminology, medicine and conservation outreach programs (HBOI).

Advanced Marine Microbiology and Molecular Biology/ Lab (BSC 6936)
The MMMB laboratory is designed to give students hands-on exposure to some of the microorganisms and techniques discussed in the MMMB lecture course. Because the majority of microorganisms (0.1 - 1%) are currently uncultivable, the techniques (such as PCR, microscopy, colony isolation, antimicrobial assays, gene cloning, RFLP and bioinformatics) will address these shortfalls through hands on experiments and analysis by students in modern microbiological and molecular laboratories (HBOI).

Behavior of Marine Animals (PCB 6412)
An introduction to the behavior of marine organisms in relation to their ecology and evolution. Physiology of Marine Animals (PCB 6775). A study of how marine animals function in their environment.

Marine Animal Behavior (Behavior of Marine Animals) (PCB 6412)
An introduction to the behavior of marine organisms in relation to their ecology and evolution.

Marine Ecology (PCB 6317)
A study of the principles, concepts, and techniques of marine and estuarine ecology. Environmental factors, adaptations, habitats, communities, and applications of current ecological theory and studied. Lecture, Laboratory, and fieldwork are included.

Natural History of Fishes (ZOO 6456); Lab (6456L)
The natural history of marine and freshwater fishes, emphasizing anatomy, functional morphology, general classification, and phylogenetic relationships, as well as biology of fishes in different habitats. Lecture, laboratory, and field study are included.

Seminar in Ichthyology (ZOO 6459)
A critical review of current literature dealing with fishes and fisheries. This course may be repeated for credit to a maximum of 4 credits.

MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY
Advanced Cardiovascular Physiology (BSC 5931)
A comprehensive study of cardiovascular physiology including cardiac electrophysiology, electrocardiography, cardiac mechanics, hemodynamics, microcirculation and lymphatics, peripheral circulation and control, control of cardiac output, exercise and hemorrhage.

Advanced Immunology (PCB 6236)
A study of the chemical and biological natures of antigens and antibodies: their preparation and reactions in vivo and in vitro, their applications in basic science and therapy, and the immunochemical and experimental methods involved with tagged or free immunologic products.

Biochemistry of the Gene (BCH 5415)
A detailed study of selected topics in molecular biology, including DNA replication, gene regulation, transcription and RNA processing, and techniques of genetic engineering.

Bioinformatics (BSC 6458)
A practical approach to accessing nucleic/protein databases, management of databases, identification of genes, and electronic expression profiling.

Brain Diseases: Mechanism and Therapy (BMS 6736)
Discussion of the molecular and cellular basis of brain diseases and of the current status of therapeutic intervention for those diseases.

Case Based Problems in Clinical Medicine (currently PCB 6930)
Use of clinical cases to teach human integrated biology.

Cell Physiology of the Heart (currently PCB 6930)
Analysis of physiological functions of heart cells.

Cellular Neuroscience and Disease (BSC 6936)
Cellular neuroscience from the point of view of human neurological diseases. This will connect various defects in development to neurological disorders such as Alzheimer's, Parkinson's, and Lou Gehrig's disease. This will examine molecular mechanisms involved in axon/dendrite growth and guidance, synapse formation, regeneration and degeneration. This course will also examine synaptic plasticity in context of memory and learning. The final part will cover electrical properties of neurons and muscles and their connections to such diseases as Myasthenia Gravis and cardiac arrhythmics.

Cell Structure and Function (BSC 6936)
This course provides a clear in-depth look into the discoveries made in the recent past and present especially focusing on the key concepts in the exciting areas of Eukaryotic Molecular Biology while studying a variety of biological processes at the cellular and molecular levels.

Computational Neuroscience I (ISC 6460)
Covers the basics of computational neurosciences and introduces many research topics of both biological and artificial neural networks.

Computational Neuroscience II (ISC 6461)
This course is organized as lecture and project. It is for graduate students who have taken Computaional Neuroscience I or equivalent. The topics will change every years so students can take it more than once.

Developmental Biology Seminar (BSC 6936)
Integration of cellular and molecular biology with research will involve seminars on various research projects, Critique of journal articles and seminar on specific signaling pathways.

Developmental Neurobiology (PSB 6515)
In-depth coverage of the principles and recent advances in the development of the brain and nervous system, including nerve cell migration, axon outgrowth, specificity, plasticity, neurotrophism, nerve cell death, and the influence of experience on the nervous system.

Environmental Physiology (BSC 6936)
This class examines how animals function and respond to their natural environments, with reflections on behavioral strategies, ecology, evolution, and physiology. The initial part of the course looks at general adaptations to specific challenges faced by animals in different environments, the second part of the class examines how animals adapt to specific environments (e.g. desert, polar).

Journal Club - Molecular Biology (BSC 6956)
A practical approach to learning how to discuss scientific literature in molecular biology in a journal club format.

Methods in Complex Systems (ISC 6450)
Classical statistical analysis and inference of systems and how those statistical methods analysis procedures differ for nonlinear complex systems. topics include fractals, chaos, neural networks, and self-organizing critical systems.

Molecular Basis of Disease and Therapy
This course will explore the molecular basis of selected viral pathogens, genetic diseases and cancer through a series of lectures from the instructor and presentation by faculty members in the College of Science, Biomedical Science, Scripps Florida and the private industry. Novel technologies aimed at the development of therapeutics will be discussed together with the activity of modern biotechnologies in drug development. Journal Reviews and group discussions will integrate the lectures. Students will be expected to attend lectures, participate in discussions, and give an oral presentation related to the topics discussed during the course.

Molecular Biology of Cardiovascular Systems & Cardiac disease (currently PCB 6930)
This course will introduce the principal aspects of cadiovascular responses to mechanical, hormonal and ischemic stress and examine the implications for future therapies of cell fate decisions including cell cycle processes and apoptosis.

Neuroscience 1 (PSB 6345)
In-depth coverage of the principles of neural science, including nerve cell biology, membrane biophysics, neurotransmission, and functional neuroanatomy.

Neuroscience 2 (PSB 6346)
Prerequisite: PSB 6345 or permission of instructor. In-depth coverage of the principles of neural science, including functional neuroanatomy, sensory processes, neural development and higher brain function such as learning and memory.

Principles of Neuroscience (PSB 6037)
A survey of principles of neuroscience as they relate to behavior. Topics include morphology and connectivity of neural cells, biological potentials, gross structure of the central and peripheral nervous system, and sensory, motor, and higher-order integrative functions.

Protein Misfolding and Disease (PCB 6933)
In this course we will discuss a range of diseases that result from misfolding in relation to their structural bases, molecular pathology, implications for normal folding, possible treatments and roles in non-Mendelian inheritance.

Reproductive Endocrinology (PCB 6804)
Study the anatomy, histology, biochemistry and physiology of the human reproductive system, with an emphasis in reproductive endocrinology. This course is taught in a case-base manner. A student seminar is required at the end of the course.

RNA Biology and Diseases (PCB 6525)
Course provides advanced-level training in molecular biology of RNA. Topics covered include principles of RNA structure, function, and metabolism; methodologies for studying RNA; diseases related to RNA deficiencies; and applications of RNA technologies in research and clinical development.

OTHERS
History of Experimental Biology (BSC 6162)
An overview of the development of the physiological sciences from Mesopotamia to the present day.

Seminar in Hypoxic Stress (BSC 6936)
In this class we will be looking at the effects of oxygen and hypoxia on living organisms, from the molecular level to populations and the environment. We begin with a review of oxygen-dependent physiology and the catastrophe of the absence of oxygen. Students then present papers in a journal club style format on their area of interest related to hypoxia. Guest lecturers will also present topics of interest in their field of speciality.

Integrative Biology Ph.D. annual research progress report

Research Advisor/Chair and student of the student's committee: Shall submit this form once a year **(starting from the end of the second academic year)** for each student you are supervising.

Annual deadline: *End of Fall semester* after the annual supervisory/dissertation committee meeting.

Project year:

Research advisor:

Committee Members:
1.

2.

3.

4.

5.

Student:

Date of the last committee meeting:

Fill in sections A-F as appropriate. Retain the header and type on the space provided under each section as appropriate. Enter N/A if no information is provided.

A. **Research progress:** Briefly describe the research activities conducted by the student during the project year. Include overall evaluations from the committee, and if any deficiencies noted and proposed recommendations by the committee to rectify with a specific time frame.

_____.

B-F: Include if applicable.

B. **Presentations:** List abstracts, posters presented during the project year. Include internal and external presentations/seminars.

_____.

C. **Manuscripts:** List manuscripts submitted/accepted or published during the project year. Give details on author citations/journals etc for in press/published manuscripts.

_____.

D. Grants: List any grant application (s) in which the student's work has been used as data. Give only the title of the grant/agency/PI information.
_____.

E. Patents: List any patent applications with dates (invention disclosure/provisional/full) filed based on the work by the student.
_____.

F. Others: Include anything else you feel necessary.

_____.

Chair of the committee:

Full name: _____

_____ _____
Signed by Name (signature in original) Date

Student: I read this progress report and agree to comply with the recommendations.

Full name: _____

_____ _____
Signed by Name (signature in original) Date

NOTE: THE SIGNATURE PAGE MUST CONTAIN A PART OF THE TEXT FROM THE PREVIOUS SECTIONS. SUBMISSION OF THIS FORM IS THE RESPONSIBILITY OF THE RESEARCH ADVISOR.

Mail original to Ms. Jennifer Govender, SC 136 – Boca Campus

Graduate Student Scholarships from the Department:

- **Boca Raton Orchid Society Endowed Scholarship:** Established in 1995 by the Boca Raton Orchid Society, this scholarship, which provides awards to botany majors, is based on academic ability.
- **Rosalyn E. Schonzeit Scholarship in Environmental Studies:** Established in 2000 by the late Sydney Altman in memory of his late wife, this scholarship is awarded to students pursuing a course of study in environmental studies, with a minimum 3.0 GPA, and demonstrated financial need.
- **Courtenay Graduate Scholarships in Conservation Biology:** Created by faculty, staff, and friends of Dr. Walter Courtenay, who retired from a 32-year teaching career in 1999, the scholarship is awarded to a graduate student in conservation biology based on academic merit.
- **Capt. Al Nathan Memorial Scholarship:** This scholarship is awarded annually to graduate students studying marine biology.
- **Vincent Saurino Fellowship for Graduate Students in Biological Science:** This fellowship was created in 2000 by Richard Huisking, in memory of Dr. Saurino, a founding faculty member in the Biological Sciences Department. It is to be used to annually award scholarship support to four outstanding graduate students who are pursuing academic and professional careers in Biological Sciences.
- **Dr. G. Alex and Carla Marsh Scholarship Fund:** Created in 2006 by the generosity of Dr. G. Alex and Mrs. Carla Marsh, this fund is used to award two scholarships annually; one to a student enrolled in Marine Biology and one to a student in the Ecology program.
- **Lutz Memorial Scholarship:** Established in memory of the late Dr. Peter Lutz, Eminent Scholar in Biology, this scholarship is awarded to two outstanding students pursuing a course of study in marine biology, with a minimum 3.0 GPA and demonstrated financial need.
- **National Save the Sea Turtle Foundation Scholarship:** This scholarship is awarded to promising graduate students pursuing research in marine biology, which contributes to sea turtle biology and conservation.

Graduate Student Feedback

1. What has been your experience thus far as a student in the Department of Biological Sciences?

a. This far my experience has been fine.

b. I enjoy the research that I am doing and my colleagues, but I feel that the university places too much emphasis on constantly changing paperwork and regulations. Since I have been here, many policies, including major ones, have changed on a semester-to-semester basis. The availability of relevant coursework is lacking. I would feel more connected to my program if the program was interested in what I am doing, rather than if I complete required paperwork on time.

c. My experience in the Biology department has included both undergraduate and graduate experience. Although nice, it would have been nice if there were a way to inform current students, regardless of educational level, of the events and programs that are available to them.

d. My experience has been positive, however quite frustrating at times because there is no clear explanation of many of the requirements for the Department of Biology and I often receive conflicting answers from people in the department.

e. I am a first semester Masters student at the Harbor Branch campus. Thus far, I have found that choosing classes has been difficult because very few are taught from or videoed to HBOI. Determining program requirements has also been extremely difficult. The Masters/Graduate Biology website contains only the bare minimum, with some links that fail to work. When seeking clarification, I have also found that many faculty or staff of the department will give conflicting answers.

f. I think the graduate program at FAU was the right choice for me. There is a lot of great research on diverse topics within the Biology Department. I have met some fantastic mentors and made great friends here.

g. I have had a really great experience as a student within the Department of Biological Sciences. I enjoy my classes, there are a lot of resources available to me, and I can get all my questions answered. Compared to my last Department of Biology, FAU's department is more organized and friendly.

h. Having just my completed my first master's thesis semester I would say my experience has been considerably smooth and educational.

i. Excellent, nothing negative stands out!

2. Are you progressing toward all of your academic targets in a timely fashion?

a. Eventually, yes. There was a snag next semester with a class being cancelled, but I will take it later.

b. Yes, I completed all my required coursework and proposed my dissertation research within my first two years. I am currently taking only research credits.

c. With the help of Michelle Cavallo and Rebecca Dixon I have been able to stay on track with all of my studies and my plans.

d. Yes, I am on track academically

e. So far yes, but it is only my first semester.

f. I feel that I am on track, however, I do feel that my efforts are doubled in trying to make everything work out because I am a student at the Harbor Branch Oceanographic Institute, and there are very few courses offered up on this campus. The commute to Boca Raton is long and takes a lot of time out of my busy schedule.

g. yes

h. Everything seems to be progressing well.

i. Yes, mostly

3. Who specifically has been helpful to you within the Department of Biological Sciences?

a. Geri Mayer, Michelle Cavallo, Cathy Trivigno, and Ken Dawson-Scully have been phenomenal.

b. It's difficult to say who has been helpful, since most of the administrative positions are temporary and many members have interim titles. I feel like most of the time, people and policies are changing so quickly so that no one can catch up, and when I have a question, no one can answer it. However, both my advisor and Michelle Cavallo have been extremely helpful and diligent in tracking down answers to our questions.

c. See above answer.

d. Mainly my advisor has been the biggest help

e. My adviser, Dr. Joshua Voss, has been the most helpful at answering my questions or finding someone who can.

f. Michelle Cavallo, Rebecca Dixon and Geri Mayer have been most helpful to me. My Adviser Dr. Shirley Pomponi, as well as Dr. Wyneken and Dr. Brooks have played a huge role in my graduate career as mentors.

g. Michelle Cavallo, Sheryl Van Der Heiden, Cristina De La Rosa

h. I have been very fortunate to have the help of Rebecca Dixon, Michelle Cavallo, Kailiang Jia, Geri Meyer, and Daniela Scheurle.

i. Michelle Cavallo and Cathy Trivigno along with my primary advisor of course

4. What are some good things that have happened to you since becoming an FAU student majoring in Biology?

a. I have learned an immense amount and gained valuable experience.

b. I have met many colleagues in my field, both at FAU and other institutions, that I feel will be helpful in my future career. I have been particularly lucky with funding sources, so I am able to conduct the research I am interested in on a timely schedule. I know other students are no so lucky in this respect, so I consider my experience relatively unique.

c. I have thankfully received several fellowships and scholarships that have been essential to continuing my education with less stress than it already comes with. This is all in thanks to the emails sent from Michelle.

d. I received an RA position

e. I received a position as a research assistant in my adviser's lab.

f. I discovered a new area of research interest; realized some subjects that I would like to further studies in to better improve my background knowledge; and I have become a lot better and organizing all of my activities and duties.

g. I have been working on my research in a field that I really enjoy.

h. Working as a TA and receiving aid in tuition has been amazing. Also, the assistance Dr. Jia has given me as a mentor has been unbelievably helpful.

i. Having more opportunities to present my research

5. What are some things/resources that you do not have that would be helpful to you?

a. A shuttle to the Jupiter campus would be lovely.

b. I wish there was an online resource that has updated information regarding program requirements and available courses.

c. Easier access to software for research/thesis writing.

d. Clear explanation of required classes, if any. Up to date class schedules when trying to register for class, there always seems to be issues with classes either not being offered or not being available when registration opens. I would also like to see a better use of the video conference capabilities when meetings are made mandatory at the Boca campus to broadcast them to other campuses.

e. A more informative website, with working links and information about program requirements.
More graduate classes or opportunities on the HBOI campus, not just Boca.

f. Better communication and transportation between the HBOI campus and Boca Raton. I think the university can do a better job and finding some way to make students up here, including myself, feel a part of the FAU community rather than isolated outsiders.

g. I would like to know about major events or speakers in chemistry, physics, or mathematics. Right now, I am not really sure where to find this information.

h. The main thing that seems lacking is available courses to fulfill my departmental requirements in the Biological Science category that are not Ecology or Neuroscience oriented.

i. Easier transportation between campuses and an on campus gym

6. What are some things that you would like to see happen within the Department of Biological Sciences?

a. I don't have any suggestions yet.

b. Less constant change of policies and requirement, more stable administrative positions.

c. A biology newsletter.

d. I would like to see more conformity in the information I receive from different people within the department, as well as mandatory meetings and trainings either broadcast to other campuses or done so they provide more accurate information.

e. The mandatory annual Masters student meeting should be removed. It was uninformative, often providing contradictory information, and took much more time than necessary.
Also, I would like to see more classes broadcast to HBOI and other satellite campuses.

f. I really enjoy the events hosted by ABBS and GPSA. Perhaps more social events and science collaboration events within the Biology department for undergraduate and graduate students.

g. More integration with the different science departments.

h. I would like to see a clearer pathway for those who are interested in molecular biology that would be separate from the previously mentioned courses.

i. More student and faculty social meetings between campuses

7. Do you feel that when you have a problem that a Faculty or Staff member is accessible to talk to you within the department?

a. Absolutely.

b. “Yes, my advisor and Michelle Cavallo are always available to answer questions.”

c. Yes.

d. I feel they are accessible, however I often get conflicting answers.

e. Overall, no. When trying to find the appropriate person to ask questions of, I have found that I either receive contradictory responses or am told to contact other people who then reroute me to additional people or to the original person I tried to contact.

f. Always.

g. Yes, most definitely.

h. The faculty and staff have been accessible, available, and very gracious.

i. Yes

Appendix B. Data Tables.

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Table A. Annualized State Fundable Undergraduate FTE in/out of Biology or the College of Science.

Biological Sciences					**College Total**	**University Total**
		2011-12	**2011-12**	**2012-13**	**2012-13**	**2012-13**
Lower Division	Majors within the department	115.8	127.9	132.5	202.4	729.1
	Majors outside the department, but within the college	64.6	74	73.4	839.9	1,743.9
	Majors outside the college	232.2	253.3	271.7	1,606.2	4,111.2
	Total	412.7	455.3	477.5	**2,648.5**	**6,584.2**
Upper Division	FTE produced by students who are:					
	Majors within the department	320.2	308.3	296.6	785.7	5,103.4
	Majors outside the department, but within the college	27.3	30.3	38.2	268.5	2,343.8
	Majors outside the college	33.1	34.2	34	246.0	1,313.6
	Total	380.7	372.8	368.9	**1,300.2**	**8,750.8**

Table B. Undergraduate Average Class Size And Faculty/Student Ratio.

Undergraduate Classes		Biological Sciences			College Total	University Total
		2010-11	2011-12	2012-13	2012-13	2012-13
Type						
Lecture/ Seminar	# Sections	89	97	85	692	5,154
	# Enrolled	8,821	9,255	9,378	47,552	192,004
	Avg Section Enrollment	99.1	95.4	110.3	**68.7**	**37.3**
	# Faculty Taught	63	62	68	475	3,487
	% Faculty Taught	70.8	63.9	80	**68.6**	**67.7**
Lab	# Sections	273	310	316	633	931
	# Enrolled	5,487	5,889	6,223	12,456	18,859
	Avg Section Enrollment	20.1	19	19.7	**19.7**	**20.3**
	# Faculty Taught	45	52	62	345	502
	% Faculty Taught	16.5	16.8	19.6	**54.5**	**53.9**
Discussion	# Sections	6	54	58	125	258
	# Enrolled	132	1,272	1,354	3,989	7,208
	Avg Section Enrollment	22	23.6	23.3	**31.9**	**27.9**
	# Faculty Taught	0	54	58	78	211
	% Faculty Taught	0	100	100	**62.4**	**81.8**
Other Course Types	# Sections	134	144	132	322	1,380
	# Enrolled	422	441	435	974	8,897
	Avg Section Enrollment	3.1	3.1	3.3	**3.0**	**6.4**
	# Faculty Taught	118	129	119	304	1,073
	% Faculty Taught	88.1	89.6	90.2	94.4	77.8

Table C. Undergraduate Students Engaged In Scientific Research In The Department Of Biological Sciences - 2012-2013 (Including Summer 2012).

	Total	Underrepresented minorities*		Women	
	Number	Number	Percent	Number	Percent
Undergraduate researchers (100% enrolled at FAU)	224	106	47%	150	67%
Biology faculty mentors hosting undergraduate researchers	22	3	14%	7	32%

*Black, African American, Hispanic, Latino/a, American Indian, Alaska Native, and Native Pacific Islander.

Table D. Undergraduate Student Profile.

Undergraduate (Program CIP: 260101)		Biological Sciences		College Total	University Total
		2011-12	2012-13	2012-13	2012-13
American Indian/ Alaskan Native	Female	6	8	23	96
	Male	4	10	13	77
	Total	10	18	36	173
Asian or Pacific Islander	Female	148	143	247	776
	Male	79	85	145	664
	Total	227	228	392	1,440
Black (Not of Hispanic Origin)	Female	356	354	769	3,535
	Male	156	169	334	2,129
	Total	512	523	1,103	5,664
Hispanic	Female	359	414	952	3,922
	Male	205	228	435	2,855
	Total	564	642	1,387	6,777
White (Not of Hispanic Origin)	Female	674	657	1,576	7,431
	Male	423	427	956	6,217
	Total	1097	1084	2,532	13,648
Non-Resident Alien	Female	42	44	87	318
	Male	20	16	30	294
	Total	62	60	117	612
Not Reported	Female	8	15	33	130
	Male	6	12	17	79
	Total	14	27	50	209
Total	Female	1,593	1,635	3,687	16,208
	Male	893	947	1,930	12,315
	Total	2,486	2,582	5,617	28,523

Table E. Graduating Senior Surveys.

	2010-11	2011-12	2012-13	Average
Number of respondents	62	74	87	74
Number of graduates (bachelors)	275	317	297	296
Percent of graduates that responded	23%	23%	29%	25%
Percent pursuing graduate/professional education	72.6	77	70.1	73%
Percent planning to reside in South Florida	74.2	75.7	73.6	75%
Percent very satisfied/satisfied with preparation for graduate/professional school	77.4	72.9	73.5	75%
Percent that stated that FAU contributed a great deal to their ability to apply scientific knowledge and skills	62.9	62.2	66.7	64%

Table F: Outcomes Through Year 2 For Undergraduate Biology Majors Transferring From A Florida Public Community College (With Or Without An AA Degree).

Outcomes through year 2			Entering Year											
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total		#	111	102	121	172	180	209	231	207	223	299	327	366	393
		%	100	100	100	100	100	100	100	100	100	100	100	100	100
Graduate @ FAU		#	11	12	13	19	23	30	31	7	16	20	24	18	-
		%	9.9	11.8	10.7	11.0	12.8	14.4	13.4	3.4	7.2	6.7	7.3	4.9	-
Graduate @ other SUS Institution		#	1	1	-	1	-	-	1	1	-	1	-	-	-
		%	0.9	1.0	-	0.6	-	-	0.4	0.5	-	0.3	-	-	-
Persist		#	68	72	79	112	124	131	145	151	154	217	254	264	-
		%	61.3	70.6	65.3	65.1	68.9	62.7	62.8	72.9	69.1	72.6	77.7	72.1	-
Transfer to other SUS		#	9	4	5	3	3	6	12	7	10	9	9	9	-
		%	8.1	3.9	4.1	1.7	1.7	2.9	5.2	3.4	4.5	3.0	2.8	2.5	-
Leave		#	22	13	24	37	30	42	42	41	43	52	40	75	-
		%	19.8	12.7	19.8	21.5	16.7	20.1	18.2	19.8	19.3	17.4	12.2	20.5	-

Table G: Outcomes Through Year 4 For Undergraduate Biology Majors Transferring From A Florida Public Community College (With Or Without An AA Degree).

Outcomes through year 4		Entering Year												
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total	#	111	102	121	172	180	209	231	207	223	299	327	366	393
	%	100	100	100	100	100	100	100	100	100	100	100	100	100
Graduate @ FAU	#	53	48	51	73	84	93	94	83	91	126	-	-	-
	%	47.7	47.1	42.1	42.4	46.7	44.5	40.7	40.1	40.8	42.1	-	-	-
Graduate @ other SUS Institution	#	7	3	3	4	1	7	12	8	6	6	-	-	-
	%	6.3	2.9	2.5	2.3	0.6	3.3	5.2	3.9	2.7	2.0	-	-	-
Persist	#	15	15	24	31	34	39	42	44	39	58	-	-	-
	%	13.5	14.7	19.8	18.0	18.9	18.7	18.2	21.3	17.5	19.4	-	-	-
Transfer to other SUS	#	4	1	4	3	3	3	5	8	8	9	-	-	-
	%	3.6	1.0	3.3	1.7	1.7	1.4	2.2	3.9	3.6	3.0	-	-	-
Leave	#	32	35	39	61	58	67	78	64	79	100	-	-	-
	%	28.8	34.3	32.2	35.5	32.2	32.1	33.8	30.9	35.4	33.4	-	-	-

Table H: Outcomes Through Year 6 For FTIC Undergraduate Biology Majors.

Outcomes through year 6		Entering Year												
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total	#	240	235	266	351	369	302	331	388	432	416	503	625	560
	%	100	100	100	100	100	100	100	100	100	100	100	100	100.0
Graduate @ FAU	#	88	101	115	136	146	145	144	180	-	-	-	-	-
	%	36.7	43.0	43.2	38.7	39.6	48.0	43.5	46.4	-	-	-	-	-
Graduate @ other SUS Institution	#	12	13	14	15	21	19	11	17	-	-	-	-	-
	%	5.0	5.5	5.3	4.3	5.7	6.3	3.3	4.4	-	-	-	-	-
Persist	#	32	33	32	56	46	35	43	58	-	-	-	-	-
	%	13.3	14.0	12.0	16.0	12.5	11.6	13.0	14.9	-	-	-	-	-
Transfer to other SUS	#	8	4	9	14	7	7	8	7	-	-	-	-	-
	%	3.3	1.7	3.4	4.0	1.9	2.3	2.4	1.8	-	-	-	-	-
Leave	#	100	84	96	130	149	96	125	126	-	-	-	-	-
	%	41.7	35.7	36.1	37.0	40.4	31.8	37.8	32.5	-	-	-	-	-

Table I. Graduate Student Enrollment Information.

Annual Headcount (Program CIP: 260101)	Biological Sciences												College Total	University Total
	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2012-13	2012-13
Masters	76	78	94	83	88	77	60	52	67	64	72	66	228	4675
Doctoral			9	32	58	60	72	72	74	74	71	78	279	927

Table J. Annualized State Fundable Graduate FTE in/out of Biology or the College of Science.

Annualized State-Fundable FTE	Biological Sciences												College Total	University Total
	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2012-13	2012-13
Graduate Total	23	30.8	44.5	46.9	63.7	73.8	67.3	67.1	74.7	76.6	74.7	65	228.2	2,223.70

Annualized Graduate State-Fundable FTE Produced In/Out of Departmen t/College		Biological Sciences												College Total	University Total
		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2012-13	2012-13
FTE produced by students who are:															
Majors within the department		19.4	28.8	38.1	42.1	58.2	65.2	61.4	60.2	69.4	72.1	69.3	57.8	188.3	1730.7
Majors outside the department, but within the college		2.3	0.9	1.4	0.7	0.2	0.4	0.5	0.8	0.5	0.3	0.8	0.9	17	348.50
Majors outside the college		1.3	1.2	4.9	4.1	5.3	8.3	5.4	6.1	4.7	4.3	4.6	6.2	22.9	144.4
Total		**23**	**30.8**	**44.5**	**46.9**	**63.7**	**73.8**	**67.3**	**67.1**	**74.7**	**76.6**	**74.7**	**62**	**228.2**	**2,223.70**

Table K. Graduate Average Class Size And Faculty/Student Ratio.

		Biological Sciences												College Total	University Total
		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2012-13	2012-13
Lecture/ Seminar	# Sections Offered	13	14	27	34	60	66	63	52	42	54	45	53	167	1,575
	# Enrolled	164	137	288	286	389	409	270	280	300	303	289	339	1,386	22,406
	Average Section Enrollment	**12.6**	**9.7**	**10.6**	**8.4**	**6.4**	**6.1**	**4.3**	**5.4**	**7.1**	**5.6**	**6.4**	**6.4**	**8.3**	**14.2**
	# Sections Faculty-Taught	10	12	20	26	50	55	57	48	42	50	41	49	158	1,318
	% Sections Faculty-Taught	**76.9**	**85.7**	**74.1**	**76.5**	**83.3**	**83.3**	**90.5**	**92.3**	**100**	**92.6**	**91.1**	**92.5**	**94.6**	**83.7**
Lab	# Sections Offered	1	1	2	2	2		1	1		2	1		1	42
	# Enrolled	13	12	15	13	15		4	2		13	5		20	465
	Average Section Enrollment	**13**	**12**	**7.5**	**6.5**	**7.5**		**4**	**2**		**6.5**	**5**		**20**	**11.1**
	# Sections Faculty-Taught	1		1	2			1	1		1	1		1	26
	% Sections Faculty-Taught	**100**		**50**	**100**			**100**	**100**		**50**	**100**		**100**	**61.9**
Other Course Types	# Sections Offered	11	28	84	180	206	238	241	277	277	313	301	332	756	1,951
	# Enrolled	124	179	207	250	287	322	343	391	443	450	457	428	1,080	4,840
	Average Section Enrollment	**11.2**	**6.3**	**2.4**	**1.3**	**1.3**	**1.3**	**1.4**	**1.4**	**1.6**	**1.4**	**1.5**	**1.3**	**1.4**	**2.5**
	# Sections Faculty-Taught	9	28	79	169	177	196	222	248	251	285	275	292	703	1,831
	% Sections Faculty-Taught	**81.8**	**100**	**94**	**93.9**	**85.9**	**82.4**	**92.1**	**89.5**	**90.6**	**91.1**	**91.4**	**88**	**93**	**93.8**

Table L. Graduate Student Profile.

	Biological Sciences												College	University Total
	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2012-13	2012-13
American Indian/Alaskan Native Female													2	11
Male			1	0										8
Total			1	0									2	19
Asian or Pacific Islander Female	3	4	10	9	9	6	7	8	5	5	5	3	14	155
Male	1	2	1	1	1	1	1	1	2	2	2	3	13	119
Total	4	6	11	10	10	7	8	9	7	7	7	6	27	274
Black (Not of Hispanic Origin) Female	3	5	6	4	1	1	1	2	2	2	2	3	10	624
Male		1			2	1	1	2	2	3	2	2	20	265
Total	3	6	6	4	3	2	2	4	4	5	4	5	30	889
Hispanic Female	2	2	9	13	12	11	8	9	9	9	6	10	27	495
Male	2	3	3		5	4	1	2	2	3	3	4	25	318
Total	4	5	12	13	17	15	9	11	11	12	9	14	52	813
White (Not of Hispanic Origin) Female	32	28	35	49	56	61	47	44	62	60	62	54	158	1,926
Male	20	22	32	24	25	30	38	31	34	35	36	40	143	1,233
Total	52	50	67	73	81	91	85	75	96	95	98	94	301	3,159
Non-Resident Alien Female	11	10	10	9	22	10	14	15	14	14	18	17	38	177
Male	2	1	2	6	13	12	14	10	9	5	6	6	53	200
Total	13	11	12	15	35	22	28	25	23	19	24	23	91	377
Not Reported Female											1	2	4	41
Male											0			30
Total											1	2	4	71
Total Female	51	49	70	84	100	89	77	78	92	90	94	89	253	3,429
Male	25	29	39	31	46	48	55	46	49	48	49	55	254	2,173
Total	76	78	109	115	146	137	132	124	141	138	143	144	507	5,602

Table M. Masters And Doctorate Graduation Rates.

	Year Degree Granted													All
	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	
Degree Level														
Masters	28.0	22.0	30.0	25.0	23.0	29.0	34.0	16.0	18.0	18.0	22.0	32.0	38.0	**335.0**
Doctorate							4.0	11.0	9.0	6.0	9.0	15.0	11.0	**65.0**
All	28.0	22.0	30.0	25.0	23.0	29.0	38.0	27.0	27.0	24.0	31.0	47.0	49.0	**400.0**

Table N1. Faculty Profile: Instructional Faculty (Tenured, Tenure-Earning, & Non-Tenure-Earning).

Instructional Faculty (Tenured, tenure-earning, & non-tenure-earning)	Biological Sciences		College Total			University Total
	2010-11		2011-12	2012-13	2012-13	2012-13
American Indian/Alaskan Native	Male					1
	Total					1
Asian or Pacific Islander			0	0	1	1
	Female				7	28
	Male	5	5	5	15	78
	Total	5	5	5	23	107
Black (Not of Hispanic Origin)						1
	Female	1	1	1	1	30
	Male	2	2	2	3	18
	Total	3	3	3	4	49
Hispanic					1	1
	Female	1	1	1	3	34
	Male				4	23
	Total	1	1	1	8	58
White (Not of Hispanic Origin)		0		0	0	3
	Female	4	4	4	23	276
	Male	13	14	14	86	382
	Total	17	18	18	109	661
Total		0	0	0	2	6
	Female	6	6	6	34	368
	Male	20	21	21	108	502
	Total	26	27	27	144	876

Source: Instruction and Research File, IEA.

Instructional Faculty includes tenured, tenure-earning and non-tenure-earning faculty members who taught a course during the year.

Table N2. Faculty Profile: Instructional Faculty (Adjuncts).

Adjuncts		Biological Sciences			College Total	University Total
		2010-11	2011-12	2012-13	2012-13	2012-2013
American Indian/Alaskan Native	Female					1
	Total					1
Asian or Pacific Islander	Female		1		1	11
	Male		1	1	1	11
	Total		2	1	2	22
Black (Not of Hispanic Origin)	Female	1	1		3	33
	Male					14
	Total	1	1		3	47
Hispanic	Female		1			10
	Male					10
	Total		1			20
White (Not of Hispanic Origin)	Female	4	4	3	14	288
	Male	9	7	4	13	219
	Total	13	11	7	27	507
Total	Female	5	7	3	18	343
	Male	9	8	5	14	254
	Total	14	15	8	32	597

Source: Instruction and Research File. IEA.

Table O. Faculty Research: Review Of Department Dashboard Indicators In Part II.

				Biological Sciences			College Total	University Total
				2010-11	2011-12	2012-13	2012-13	2012-13
Departmental Research	Tenured & tenure-earning faculty	Professor, Assoc Professor, Asst Professor	Person-Years	7.6	5.9	5.8	20.0	92.7
			FTE	10.1	7.8	7.8	26.7	123.6
	Non-tenure-earning faculty	Instructors, Lecturers, Visiting Faculty	Person-Years	0.3	0.7	0.7	1.4	4.1
			FTE	0.3	0.9	1.0	1.8	5.5
	Other personn paid on faculty pay plan	--	Person-Years				1.6	15.9
			FTE				2.1	21.2
	Total		Person-Years	7.8	6.6	6.6	22.9	112.8
			FTE	10.5	8.7	8.7	30.6	150.4
Sponsored Research	Tenured & tenure-earning faculty	Professor, Assoc Professor, Asst Professor	Person-Years	2.1	1.7	1.1	6.4	24.9
			FTE	2.8	2.3	1.5	8.5	33.2
	Non-tenure-earning faculty	Instructors, Lecturers, Visiting Faculty	Person-Years	0.1	0.3	0.3	0.3	3.7
			FTE	0.2	0.4	0.4	0.4	4.9
	Other personn paid on faculty pay plan	--	Person-Years	0.3			7.3	38.2
			FTE	0.3			9.8	50.9
	Total		Person-Years	2.5	2.1	1.4	14.0	66.8
			FTE	3.3	2.8	1.9	18.7	89.0

Table P1. Absolute Numbers For Various Aspects Of Research In Biological Sciences.

		Biological Sciences			College Total	University Total
		2010-2111	2011-2012	2012-2013	2012-2013	2012-2013
1. Books (including monographs & compositions)	#	4	3	1	22	146
2. Other peer-reviewed publications	#	49	52	46	229	1,161
3. All other publications	#	7	13	0	31	501
4. Presentations at professional meetings or conferences	#	98	98	68	308	1,435
5. Productions/Performances/Exhibitions	#	0	0	0	36	377
6. Grant Proposals Submitted	#	34	33	52	109	385
Sponsored Research & Program Expenditures						
7. Organized Research	#	$1,666,854	$1,564,706	$1,314,970	$8,625,887	$15,603,749
8. Sponsored Instruction	#	$416,521	$436,174	$393,362	$1,242,409	$6,138,254
9. Other Sponsored Activities	#	$154,222	$60,326	$1,230	$620,037	$2,565,166

Table P2. The Same Aspects Of Research In Biological Sciences In Terms Of Per Faculty Member In The Department.

		Biological Sciences			College Total	University Total
		2010-2011	2011-2012	2012-2013	2012-2013	2012-2013
1. Books (including monographs & compositions) per faculty member		0.2	0.1	0.0	0.2	0.2
2. Other peer-review publications per faculty member		2.1	2.4	2.1	2.1	1.8
3. All other publications per faculty member		0.3	0.6	0.0	0.3	0.8
4. Presentations at professional meetings or conferences per faculty member		4.3	4.5	3.1	2.9	2.3
5. Productions/Performances/Exhibitions per faculty member		0.0	0.0	0.0	0.3	0.6
6. Grant proposals submitted per faculty member		1.5	1.5	2.4	1.0	0.6
Sponsored Research & Program Expenditures						
7. Organized research expenditures per faculty member		$72,472	$71,123	$59,771	$80,616	$24,534
8. Sponsored instruction expenditures per faculty member		$18,110	$19,826	$17,880	$11,611	$9,651
9. Other sponsored activity expenditures per faculty member		$6,705	$2,742	$56	$5,795	$4,033

Table Q. Service And Community Engagement, Review Of Part II Of The Department Dashboard Indicators.

	Biological Sciences			College Total	University Total
	2010-2011	2011-2012	2012-2013	2012-2013	2012-2013
1. Faculty memberships on department, college or university committees	# 74	82	77	273	2,348
2. Faculty memberships on community or professional committees	# 37	10	12	69	972
3. Faculty serving as editors or referees for professional publications	# 93	20	23	96	611

Appendix C. Abbreviated CVs from Current Faculty Members and Instructors.

Table of Contents

ABBREVIATED FACULTY CV
Rindy C. Anderson, Ph.D.

A. Professional Preparation

Ph.D.: December 2006 University of Miami, Biology
M.S.: University of San Diego, Marine Science
B.S.: Arizona State University, Zoology
Postdoctoral Preparation: Duke University, 2006-2012

B. Appointments

Assistant Professor, Florida Atlantic University, 2014
Research Scientist, Duke University, 2012-2014
Postdoctoral Research Associate, Duke University, 2007-2012
Ph.D. Candidate, University of Miami, Biology, 2003-2006
Instructor, Biology Laboratory Courses, University of Miami 2001, 2003
Research Biologist, Hubbs-Sea World Research Institute, 1999-2001

C. Selected Peer-Reviewed Publications (most recent five from the last 7 yrs)

Grace MK, **Anderson RC** (2014). No frequency shift in Carolina chickadee 'D' notes in response to traffic noise. *Behavioral Ecology and Sociobiology*, in press.

Lachlan RF, **Anderson RC,** Peters S, Searcy WA, Nowicki S. (2014). Typical versions of learned swamp sparrow songs are more effective signals than are less typical versions. *Proceedings of the Royal Society B* 281: 20140252

Anderson RC, Klofstad CA, Mayhew WJ, Venkatachalam M. (2014). Vocal fry may undermine the success of young women in the labor market. *PLoS One* 9(5) e97506

Anderson RC, Peters S, Nowicki, S (2014). Effects of early auditory experience on the development of local song preference in female swamp sparrows. *Behavioral Ecology and Sociobiology* 68(3) 437-447

Anderson RC, DuBois AL, Piech DK, Searcy WA, Nowicki S (2013). Receiver response to an aggressive visual signal, the wing-wave display, in swamp sparrows. *Behavioral Ecology and Sociobiology* 67(4) 593–600

D. Selected Other Publications or Products/Grants (most recent five from the last 7 yrs)

MacLean EL, Hare BA, Nunn CL, Addessi E, Amici F, **Anderson RC** et al. (58 authors total) (2014). The Evolution of Self Control. *Proceedings of the National Academy of Sciences*, doi: 10.1073/pnas.1323533111

Searcy WA, **Anderson RC**, Ballentine B, Nowicki S (2013). Limits to reliability in avian aggressive signals. *Behaviour* 150(5) 1129-1145

Anderson RC, Hughes M, Searcy WA, Nowicki S (2012). The receiver-dependent cost of soft song: a signal of aggressive intent in songbirds. *Animal Behaviour,* 83(6): 1443-1448

Maddison CJ, **Anderson RC**, Prior NH, Taves MD, Soma KK (2012). Soft song during aggressive interactions: seasonal changes and endocrine correlates in song sparrows. *Hormones and Behavior*, 62: 455–463

Klofstad CA, **Anderson RC**, Peters S (2012). Sounds like a winner: Voice pitch influences perception of leadership capacity in both men and women. *Proceedings of the Royal Society of London, Biological Sciences*, 279(1738): 2698-2704

E. Synergistic Activities

-Organized symposium for the 2014 Animal Behavior Society Meeting on the function and evolution of low-amplitude signals
-National Evolutionary Synthesis Center, Durham, NC. Member of the PhyloPsy Working Group (Nov 2009) (https://www.nescent.org/wg_phylopsy/Main_Page)
-Preparing Future Faculty Fellowship Program, Duke University, 2007-2008
-NSF ADVANCE Faculty Development Workshops, Rice University, 2007 and 2010

F. Collaborators and Other Affiliations

Melissa Hughes (College of Charleston), Robert Lachlan (Queen Mary University of London), Richard Mooney (Duke University), Jonathan Prather (University of Wyoming), William A. Searcy (University of Miami), Neeltje Boogert (McGill University), Kiran Soma (University of British Columbia), Kendra Sewall (Virginia Tech), Kimberly Rosvall (Indiana University), Elizabeth Derryberry (Tulane University).

Graduate and post-doctoral advisors
M.S. advisor: Ann Bowles (Hubbs-SeaWorld Research Institute and University of San Diego)
Ph.D. Advisor: William Searcy (University of Miami)
Post-doctoral advisor: Stephen Nowicki (Duke University)

G. Courses Taught

Topics in Behavioral Ecology (University of Miami), Introductory Biology Laboratory I and II (University of Miami), How Organisms Communicate (Duke University)

H. Community Engagement or Out-reach

-National Association of Science Writers Annual Meeting (Oct 2010), invited speaker for "Lunch with a Scientist"
-Served as a mentor for three 8th grade girls in the Durham NC Women and Math Program (2010)
-Research lecture at the North Carolina Museum of Natural Sciences, April 2011
-Numerous press interviews related to published research:

-NPR health blog related to my research on the human voice:
http://www.npr.org/blogs/health/2014/10/24/357584372/video-what-women-get-flak-for-when-they-talk

-Anderson RC et al (2014). Vocal fry may undermine the success of young women in the labor market. *PLoS One* 9(5) e97506 ***Press:*** **ScienceMag.org, Huffington Post, New York Magazine (online), The Atlantic (online), CBS News (online), Shape.com**

-Anderson RC, et al. (2013). Receiver response to an aggressive visual signal, the wing-wave display, in swamp sparrows. *Behavioral Ecology and Sociobiology* 67(4) 593–600 ***Press:*** **Discovery Channel's "Daily Planet," National Geographic (online), Popular Science (online)**

-Klofstad CA, **Anderson RC**, Peters S (2012). Sounds like a winner: Voice pitch influences perception of leadership capacity in both men and women. *Proceedings of the Royal Society of London, Biological Sciences*, 279(1738): 2698-2704 ***ress:*** **BBC, NPR, The Economist (online), Scientific American (online), ScienceDaily.com, U.S. News & World Report**

Abbreviated Curriculum Vitae

John D. Baldwin Ph.D.
Professor
Department of Biological Sciences
Charles E. Schmidt College of Science
Florida Atlantic University – Davie Campus
Davie West Bldg. Rm. 438
3200 College Ave, Davie, FL 33314
Phone: (954) 236-1151
Email: jbaldwin@fau.edu
Webpage: www.science.fau.edu/biology/faculty/baldwin

A. Professional Preparation

Post-Doctoral Researcher, 1997 – 1998, Dept. Fisheries and Aquatic Sciences, School Forest Resources and Conservation, University of Florida, Gainesville, Florida
Ph.D., Cell and Developmental Biology, 1997. Div. Biological Sciences, University of California, Davis
B.S., Zoology, 1988. Department of Zoology, University of Maryland, College Park

B. Appointments

2014 – Present	*Professor*, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University
2014 – Present	*Associate Director*, Center for Environmental Studies, Charles E. Schmidt College of Science, Florida Atlantic University
2004 – 2014	*Associate Professor*, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University
2011– 2012	*Interim-Director,* Environmental Sciences Program, Charles E. Schmidt College of Science, Florida Atlantic University
2009 – 2010	*Research Fellow*, (Sabbatical), South Florida Natural Resource Center, Everglades and Dry Tortugas National Park, NPS, DOI, Homestead, FL
1998 – 2004	*Assistant Professor*, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University

C. Selected Peer-Reviewed Publications

Ogden, J.C., J.D. Baldwin, O. Bass, J. Browder, M. Cook, S. Davis, P. Fletcher, P. Fredrick, P.E. Frezza, R. Galvez, A. Hodgson, K. Meyer, L. Oberhofer, A. Paul, and J. Lorenz. 2014. Waterbirds as Indicators of Ecosystem Health in the Coastal Marine Habitats of Southern Florida: 1. Selection and Justification for a Suite of Indicator Species. *Ecological Indicators* 44, 128-147.

Ogden, J.C., J.D. Baldwin, O. Bass, J. Browder, M. Cook, S. Davis, P. Fletcher, P. Fredrick, P.E. Frezza, R. Galvez, A. Hodgson, K. Meyer, L. Oberhofer, A. Paul, and J. Lorenz. 2014. Waterbirds as Indicators of Ecosystem Health in the Coastal Marine Habitats of Southern Florida: 2. Conceptual Ecological Models. *Ecological Indicators* 44, 148-163.

Theisen, T. and J.D. Baldwin. 2012. Movements and depth/temperature distribution of the ectothermic Scombrid *Acanthocybium solandri* (wahoo) in the western North Atlantic. *Marine Biology* 159 (10) 2249-2258.

Baldwin, J.D., J.W. Bosley, L. Oberhofer, and O.L. Bass. 2012. Long-Term Changes, 1958–2010, In the Reproduction of Bald Eagles of Florida Bay, Southern Coastal Everglades. *Journal of Raptor Research* 46(4) 336-348.

Green. M.L., D.L. Herzing, and J.D. Baldwin. 2011. Reproductive success of male Atlantic spotted dolphins (*Stenella frontalis*) revealed by noninvasive genetic analysis of paternity. *Canadian Journal of Zoology* 89 (3) 239-253.

D. Selected Other Publications or Products/Grants

Hanson, M. and J.D. Baldwin. (*Submitted)*. Diets of Bald Eagles Breeding in the Subtropical Estuary of Florida Bay. *Journal of Field Ornithology*. 30pp.

Green, M.L., D.L. Herzing, and J.D. Baldwin. *(Submitted)*. Blurring the lines: Social organization influences fine-scale genetic structure in Atlantic spotted dolphins (*Stenella frontalis*) *Molecular Ecology*. 38pp.

Green. M.L., D.L. Herzing, and J.D. Baldwin. (*In Revision)*. Molecular Evidence of Promiscuity Among Female Atlantic Spotted Dolphins: Implications for Multi-male Mating Strategies. *Behavioral Ecology and Sociobiology*. 26pp.

Baldwin, J.D. 2011. Evaluation of Bald Eagle Population Dynamics and Foraging Ecology: Current and Historical Trends in Florida Bay and the Southern Estuaries of Everglades National Park. Final Report for Everglades and Dry Tortugas National Park, National Park Service. 63pp.

Theisen, T.C., B.W. Bowen, W. Lanier, and J.D. Baldwin. 2008. Lack of global population structure in the pelagic wahoo, *Acanthocybium solandri* (tuna family Scombridae). *Molecular Ecology* 17 (19) 4233-4247.

E. Synergistic Activities

Baldwin, J.D. Wildlife Species as Ecological Indicators for Everglades Restoration. Rural Sustainable Development International Congress - Savannas and Wetlands, Universidade Federal de Mato Grosso do Sul, Campo Grande, Mato Grosso do Sul, Brazil. April 1-5, 2012. (*Invited speaker*)

Denton, M., K. M. Hart, A. Oleinik, J.D. Baldwin. Diet and foraging ecology of mangrove diamondback terrapins (*Malaclemys terrapin rhizophorarum*) in Everglades National Park, FL. 33rd Annual Symposium on Sea Turtle Biology and Conservation, Baltimore, Maryland, USA. February 2-8, 2013.

Bosley, J.W., J.D. Baldwin, and E. Noonburg. Fitting an occupancy model to a declining population of bald eagle, *Haliaeetus leucocephalus*, breeding territories. 5th North American Ornithological Conference (NAOC-V) in Vancouver, British Columbia, Canada. August 14-18, 2012.

F. Collaborators and Other Affiliations

2010 – pres. Technical Science Rep., South Florida-Caribbean Cooperative Ecosystem Studies Unit 2007 – pres. Science Coordination Group, South Florida Ecosystem Restoration Federal Task Force

2000 – pres. Courtesy Assoc. Professor, Dept. Fisheries and Aquatic Sciences, Univ. of Florida

2009– 2010 Research Fellow, Dry Tortugas and Everglades National Park, NPS, Dept. of Interior

2007 – pres. Affiliate Faculty Appointment: Dept. of Geosciences, FAU

G. Courses Taught

Undergraduate Courses Taught

BCH 3033 Biochemistry I, BCH 3034 Biochemistry II, BCH 3103 Biochemistry Laboratory, BSC 3036 Genetics, BSC 4930 Ichthyology, OCB 4043 Marine Biology, OCB 4043L Marine Biology Field Studies, OCB 4633 Marine Ecology, OCB 4633L Marine Ecology Lab, ZOO 2203 Invertebrate Zoology, ZOO 2203L Invertebrate Zoology Lab, Directed Independent Studies

Graduate Courses Taught

ZOO 6456 Natural History of Fishes, ZOO 6456L Natural History of Fishes Lab, ZOO 6459 Seminar in Ichthyology, BSC 6936 Molecular Ecology 1

H. Community Engagement or Out-reach

2014 – pres. Board of Directors, South Plantation High School, Environmental Magnet Program

2007 – pres. Conservation and Research Advisory Board, The Florida Aquarium, Tampa Florida 2006 – pres. Math-Superstars Program Mentor, Broward County Public School System, Florida

ABBREVIATED FACULTY CV
Brian William Benscoter, Ph.D.

A. Professional Preparation

Southern Illinois University-Carbondale	Plant Biology	Ph.D., 2007
Villanova University	Biology	M.S., 2002
Villanova University	Biology	B.S., 2000

B. Appointments

2014-present	National Academies Education Fellow in the Life Sciences
2013-2014	Researcher of the Year (Asst. Professor), Florida Atlantic University
2014-present	Chair-Elect, Society of Wetland Scientists Peatland Section
2013-2014	Chair, Society of Wetland Scientists Biogeochemistry Section
2010-present	Assistant Professor of Plant Ecology, Florida Atlantic University
2008-2010	Post-Doctoral Associate, University of Guelph
2007-2008	Post-Doctoral Associate, Michigan State University
2003-2006	Science To Achieve Results (STAR) Fellow, US Environmental Protection Agency

C. Selected Peer-Reviewed Publications

Lauck, M and BW Benscoter. Non-destructive estimation of aboveground biomass in sawgrass communities of the Florida Everglades. Wetlands, *in press*.

Nungesser, M, C Saunders, C Coronado-Molina, J Obeysekera, J Johnson, C McVoy, BW Benscoter. Potential effects of climate change in the Florida Everglades. Environmental Management, *in press.*

Turetsky, MR, BW Benscoter, S Page, G Rein, G van der Werf, A Watts. Vulnerability of peatlands to fire and carbon loss. Nature-Geosciences (invited review), *in press.*

Meingast, KM, MJ Falkowski, ES Kane, LR Potvin, BW Benscoter, AMS Smith, LL Bourgeau-Chavez, and ME Miller. 2014. Spectral detection of near surface moisture content and water table position in northern peatland ecosystems. Remote Sensing of Environment, 152: 536-546.

Kettridge, N, DK Thompson, L Bombanato, MR Turetsky, BW Benscoter, JM Waddington. 2013 The ecohydrology of forested peatlands: simulating the effects of tree shading on moss evaporation and species composition. Journal of Geophysical Research-Biogeosciences, 118: 422-435.

D. Selected Other Publications or Products/Grants

US Department of Energy, Terrestrial Ecosystem Science 2012-2015. "Carbon dynamics of the Greater Everglades watershed and implications of climate change" ($845,554; PI: R Hinkle; Co-I: BW Benscoter ($570,915), X Comas, D Sumner, D DeAngelis) – *extension pending*

National Aeronautics and Space Administration (NASA), 2012-2015. "Fuel consumption and carbon cycling in northern peatland ecosystems: understanding vulnerability to burning, fuel consumption, and emissions via remote sensing of fuel moisture and radiative energy." ($815,133; PI: M Falkowski; Co-I: ES Kane, L Bourgeau-Chavez, N French, E Levin, ME Miller, R Kremens; Unfunded Collaborator: BW Benscoter, AMS Smith)

US Fish and Wildlife Service, 2012-2017. "Synergistic effects of invasive species (*Melaleuca quinquenervia*) and management practices on native plant community resilience in the Florida Everglades." ($45,000; PI: BW Benscoter)

US Geological Survey, 2011-2015. "Cooperative Agreement: Carbon Dynamics of the Greater Everglades" ($323,827; PI: L Berry; Co-I: BW Benscoter ($162,320), X Comas)

US Bureau of Land Management, Joint Fire Sciences Program, January 2012-2015. "Influence of fuel moisture and density on black carbon formation during combustion of boreal peat fuels" ($70,916; PI: BW Benscoter; Unfunded Co-I: ES Kane, M Falkowski)

E. Synergistic Activities

- Past-Chair, Society of Wetland Scientists, Biogeochemistry Section.
- Chair-Elect, Society of Wetland Scientists, Peatland Section
- Mentor, Society of Wetland Scientists, Undergraduate Diversity Program
- In the past 4 years, attendance at 17 technical workshops and 9 professional conferences, with over 28 presentations by members of my research lab.

F. Collaborators and Other Affiliations

Vanessa Bailey, Department of Energy
Ben Bond-Lamberty, Department of Energy
Laura Bourgeau-Chavez, Michigan Tech Research Institute
Rod Chimner, Michigan Tech University
Greg Corace, US Fish and Wildlife
William DeGroot, Canadian Forest Service
Mike Falkowski, Michigan Tech University
Michael Flannigan, University of Alberta & Canadian Forest Service
Nancy French, Michigan Tech Research Institute
Rebekah Gibble, US Fish and Wildlife
Evan Kane, Michigan Tech University
Eric Kasischke, University of Maryland
Robert Keane, US Forest Service
Paul Morris, McMaster University
Thomas Pipker, University of British Columbia
James Reardon, US Forest Service
Alistar Smith, US Forest Service
David Sumner, US Geological Survey
Tiffany Troxler, Florida International University
Merritt Turetsky, University of Guelph
Shawn Urbanski, US Forest Service
J. Michael Waddington, McMaster University
Jon Wallace, US Fish & Wildlife Service
B. Mike Wotton, University of Toronto & Canadian Forest Service

G. Courses Taught

Department of Biological Sciences, Florida Atlantic University

- BOT 5155 & 5155L Flora of South Florida & Lab, Spring 2011
- PCB 4355 Principles of Ecology, Spring 2012, Fall 2012, 2013, 2014
- BSC 6934 Plant Ecology & Lab, Spring 2013, 2014, 2015

H. Community Engagement or Out-reach

DAVID M. BINNINGER, PH.D.
ASSOCIATE PROFESSOR

A. PROFESSIONAL PREPARATION

Ph.D., Molecular Genetics, University of North Carolina, Chapel Hill, NC. December 1987. Dissertation: A transformation system for the filamentous basidiomycete, *Coprinus cinereus*.

M.S., Microbiology, University of South Florida, Tampa, FL. December 1981. Thesis: Coordinate regulation of polypeptide chain initiation and elongation in intact rabbit reticulocytes.

B.S., Biological Sciences, University of South Florida, Tampa, FL. June 1979.

B. APPOINTMENTS

2010 to Present	Director, Professional Masters Science Program – Business Biotechnology
2004 to 2007	Curriculum Director – partnership with the Workforce Alliance of Palm Beach. A grant for training in biotechnology. Funded by the Department of Labor under the President's High Growth Job Training Initiative.
2000 to Present	Associate Chair, Department of Biological Sciences, Florida Atlantic University, Boca Raton, FL
1999 to Present	Associate Professor (joint appointment), Department of Biomedical Sciences, Florida Atlantic University, Boca Raton, FL
1997 to Present	Member, Center for Molecular Biology and Biotechnology, Florida Atlantic University, Boca Raton, FL
1996 to Present	Associate Professor, Department of Biological Sciences, Florida Atlantic University, Boca Raton, FL
1990 - 1996	Assistant Professor, Department of Biological Sciences, Florida Atlantic University, Boca Raton, FL
1987 - 1990	Postdoctoral Research Fellow with the late Professor James Boyd, Genetics Department, University of California, Davis, CA.

C. Selected Peer-Reviewed Publications

M. Marchetti, L. Resnick, E. Gamliel, S. Kesaraju, H. Weissbach, and **D. Binninger** (2009) Sulindac Enhances the Killing of Cancer Cells Exposed to Oxidative Stress. PLoS One. 4(6): e5804. doi:10.1371/journal.pone.0005804

D. Brunell, M. Marchetti, E. Gamliel, D. Sagher, N. Brot, H. Weissbach, and **D. Binninger** (2009) Metabolism and Biological Activity of Sulindac and its Epimers FASEB J. **23:** 527.2 (abstract)

L. Resnick, H. Rabinovitz, **D. M. Binninger**, M. Marchetti, H. Weissbach (2009) Topical Sulindac Combined with Hydrogen Peroxide in the Treatment of Actinic Keratoses: Rationale and Clinical Trial. J. Drugs Dermatol. **8:** 29-32

D. Selected Other Publications/Products

Binninger, D. Role of oxidative damage to protein in aging, Institute on Aging, National Institutes of Health (2R15AG022556-02A1) $175,275, August 1, 2008 – December 31, 2011.

Binninger, D. Role of oxidative stress on aging and age-related neurodegenerative diseases Faculty Research seed Grant Program. Division of Research, Florida Atlantic University. $5,000. January 1, 2012 – December 31, 2013

E. Synergistic Activities

F. Collaborators and Other Affiliations

G. Courses Taught

Genetics	PCB 3063
Biotechnology Laboratory 1	BSC 4403L
Biotechnology Laboratory 2	BSC 4448L
CMBB Research Seminar	BSC 4905 and BSC 6905
Biotechnology for Bioengineers	BSC 6936 (special topics)

H. Community Engagement or Out-reach

Science Olympiad – an annual science competition for middle school and high school students in south Florida. I have been responsible for the competition in the areas of microbiology, cell biology and genetics. This year (2014) was my third or fourth time participating in this academic event.

Curriculum Vitae (November 2014) – RANDY BROOKS, PhD

A. Professional Preparation

Southwestern College, Winfield, Kansas	B.S. 1979	Biology
Florida State University, Tallahassee, Florida	M.S. 1981	Marine Biology
Florida State University, Tallahassee, Florida	PhD 1984	Marine Biology

B. Appointments

1984-1987	Assistant Professor Biology, Auburn University at Montomgery, Alabama
1987-1991	Assistant Professor of Biology, Florida Atlantic University
1991-1996	Associate Professor of Biology, Florida Atlantic University
1992-2000t	Adjunct Professor Biology, Broward County Community College
1993-1995	Visiting Researcher, Duke University Marine Laboratory, NC
1996-present	Professor of Biology, Florida Atlantic University

C. Research Interests

My research emphasis has been in the area of behavioral/physiological ecology of marine organisms, with a particular interest in symbiotic associations. These associations represent tremendous potential in demonstrating alternatives to competition as major selective agents. The significance of coevolutionary adaptations by associated organisms is just recently being acknowledged as a major evolutionary force (e.g., endosymbiotic hypothesis for development of eukaryotes). Specifically, I have usually studied associations involving organisms that live with cnidarians, including dinoflagellates, fishes, hermit crabs, and shrimp. Recently, I have also been involved in the long-term monitoring of coral reef conditions using video transects. Some recent projects involving graduate students involve: 1) temperature-induced bleaching response of zooxanthellae living in cnidarians; 2) behavioral interactions among echinoderms and symbiotic crabs; 3) predator/prey interactions within the sargassum community. My research has been extramurally funded.

D. Select Publications

A.M. McCammon and W. R. Brooks. Protection of host anemones by snapping shrimps: A case for symbiotic mutualism? *Symbiosis*. 2014, 63(2): 71-78 (DOI: 10.1007/s13199-014-0289-8)

W.R. Brooks. Behavioral, Physiological and Ecological Effects of Organisms in symbiotic Associations. In *Symbiosis: Evolution, Biology and Ecological Effects.* Eds. A.F. Camisao & C.C. Pedroso. 2012, Ch. 6, pp. 143-158.

M.A. Salazar and W.R. Brooks. Morphology, Distribution and Comparative Functional Morphology of Setae on the Carapace of the Florida Speck Claw Decorator Crab Microphrys bicornutus (Decapoda, Brachyura). *J Marine Sci Res Dev*., 2012. 2:109. doi:10.4172/2155-9910.1000109

W.R. Brooks. The Importance of Symbioses in Biological Systems. *J Marine Sci Res Dev*., 2012. 2:e108. doi:10.4172/2155-9910.1000e108

L.J. Ambrosio and W.R. Brooks. Recognition and use of ascidian hosts, and mate acquisition by the symbiotic pea crab *Tunicotheres moseri* (Rathbun, 1918): the role of chemical, visual and tactile cues. *Symbiosis*, 2011, 53, 53-61.

C.F Jobe, and W.R. Brooks Habitat Selection and Host Location by Symbiotic Shrimps Associated with *Sargassum* Communities: The Role of Chemical and Visual Cues, *Symbiosis*, 2009, 49, 77-85,

W.R. Brooks, K.A. Hutchinson, and M.G. Tolbert. Pelagic Sargassum mediates predation among symbiotic fishes and shrimps. Gulf of Mexico Sci., 2007, 2: 144-152.

E. Books/Study Guide Publications

Barcharts: Biology Terminology – 2013; Science Terminology – 2013; Molecular Biology – 2012; Zoology – 1997; Biology- 2003, 2012; Marine Biology – 2000; Botany – 2001; Physiology – 2003; Biology 2 – 2004; Ecology – 2005; Becoming a Doctor – 2006; Genetics – 2007; Biology Booklet – 2006, Bio Lab Basics, 2008; Environmental Science, 2010.

Biodiversity: The Diversity of Life, Pearson Custom Publishing, 2000, 2005.

Biological Principles: The Way Life Works, Pearson Custom Publishing, 2000, 2005.

G. Select Grants

2001-02	National Science Foundation, $130,000 project entitled, "Exploring IDEAS: An Integrated Design Enhancing Academic Success in Science, Reading and Mathematics" (with N. Romance, D. Lowell, J. Haky and D. Ploger).
2002-03	National Science Foundation, $74,999 project entitled, "Success by Design: Building Faculty Capacity to Improve Curriculum and Instruction" (with D. Lowell, J. Haky, and R. Jordan).
1997-04	National Oceanic & Atmospheric Administration, $26,000 per-year project entitled, "Coral Reef Monitoring off the Southeastern Florida Coast: Establishing Techniques and Baseline Data for Both Video and Fixed-Transect Monitoring."

H. Courses Taught

Auburn University at Montgomery, 1984-1987,
- Introduction to Marine Biology
- Human Anatomy & Physiology
- Introductory Biology
- Invertebrate Zoology

Florida Atlantic University, 1987-present
- Principles of Ecology
- Biodiversity
- Biological Principles
- Honors General Biology I & II
- Comparative Vertebrate Anatomy
- Coevolution
- Symbiosis
- Marine Biology
- Anatomy & Physiology

Broward Community College, 1992-1998
- Introductory Biology
- Anatomy & Physiology

ABBREVIATED FACULTY CV
Joseph P. Caruso, Ph.D.

A. Professional Preparation
June 2014: Small World Initiative (SWI) for Antibiotic Discovery Training Workshop for Partner Instructors, Yale University Medical School.
May 2014: attended annual meetings of American Society for Microbiology (ASM) and ASM Conference of Undergraduate Educators, Boston.

B. Appointments
August 2014: Reappointed to Editorial Board for *Journal of Microbiology & Biology Education*.
June 2014: Promoted to Senior Instructor.
May 2014: Appointed Small World Initiative Partner Instructor and one of 14 Faculty worldwide selected to attend onsite training in Antibiotic Discovery at Yale University Medical School.

C. Publications & Presentations (=undergraduate author)**
Caruso JP. 2014a. Scientific teaching at heavily minority-serving universities, part 1: converting a general microbiology course from lectures to multiple active learning methods improved student performance in one semester; ready for *J Res Science Teaching*.
Caruso JP. 2014b. Scientific teaching at heavily minority-serving universities, part 2: converting a medical bacteriology course from lectures to multiple active learning methods significantly improved student performance in one semester; ready for *J Res Science Teaching*.
Caruso JP. 2014c. Calibrated peer review use improved low-achieving student performance on the california critical thinking skills test post-test; in revision after initial submission to *J Micro & Biol Education*.
Huffman J,** Frazier E, Caruso JP. 2014d. Identification and comparison of intestinal parasites found within *Gopherus polyphemus* at two differing Southeastern Florida habitats. Poster at FAU's College of Science Research Day (1st place in Undergraduate category) and FAU Undergraduate Research Day (1st place, Marine/Environmtl. Sci.).
Elhassani D,** Caruso JP, Frazier E. 2014e. Comparative Survey of Hemoparasites at the Florida Atlantic University's Gopher Tortoise Population. Poster at FAU's College of Science Research Day and FAU's Undergraduate Research Day (2nd place, Marine/Environmtl. Sci.).

D. Selected Other Publications or Products/Grants (=undergraduate author)**
Caruso JP, Pavlovic MD, Zopo AR. 2014f. Rapid, effective blood glucose control in a type 2 diabetes patient for over ten years with a low-glycemic, high-fiber diet with added cinnamon. Manuscript ready for submission.
Caruso JP, Pavlovic MD, Lloyd BN,** Barahona LJ,** Milton SL, Kats AM, Hartmann JX. 2014g. Evidence for free immunoglobulin light and heavy chains in the blood of physiologically normal *Trachemys scripta*. Manuscript in preparation.
Caruso JP, Israel N. 2014h. The Small World Initiative Antibiotic Discovery for FAU Intro. Biology non-majors; developed and co-taught authentic research-based lab course (ongoing)
Caruso JP, Marshall P, Binninger DM. 2014i. Citizen science for the 21st century ..., Submitted to NSF IUSE, February for $1.2 million; in revision.
Caruso JP, Marshall P, Binninger DM. 2013. Metagenomics for the masses ..., Submitted as NIH R01, November for $890,000; in revision.

E. Synergistic Activities

FAU Administrator, Calibrated Peer Review (since 2011)
FAU Administrator, California Critical Thinking Skills Test (since 2011)
Member, Dept. of Biol. Sciences Assessment & Curriculum Committee
Committee member, one PhD student, Ms. Joy Young (Colin Hughes, defending 19 November);
Committee member, two MS candidates: R. Clifford Blair (Kate Detwiler), Ryan Ebanks (Evelyn Frazier), with a third in the near future (Xing-Hai Zhang)

F. Collaborators and Other Affiliations

Dr. Evelyn Frazier, Dept. of Biol. Sciences, Defining external and endoparasite dynamics in gopher tortoise populations in South Florida; AND Determining the incidence of trichinosis and sarcocystosis in feral pigs in FL.
Dr. Sarah Milton, Dept. of Biol. Sciences, Defining parameters of formazan reduction-based phagocytosis assays in two sea turtle species; AND Diagnosing/describing parasites and viruses in sea turtle blood.
Dr. David Binninger, Dept. of Biol. Sciences, Metagenomics of human skin-associated microbes.
Dr. James Hartmann, Dept. of Biol. Sciences, Immunoglobulins and immune responses in turtles.
Dr. Kate Detwiler, FAU Dept of Anthropology, Intestinal parasites of *Cercopithecus ascanius, C. mitis* and a recently emerged hybrid population in Gombe' National Park, Tanzania; AND Intestinal parasites of *Cercopithecus lomamiensis*, a recently-described guenon species.
2014 Partner Instructor for The Small World Initiative: Crowdsourcing Antibiotic Discovery

G. Courses Taught

General Microbiology, Medical Bacteriology, Microbiology for the Health Services, Inquiry-based Microbiology Lab, Honors Immunology, Life Science Lecture, Molecular Genetics, Genetics, the Small World Initiative Antibiotic Discovery for nonmajors (Life Science Lab)

H. Community Engagement/Outreach

Ad Hoc Reviewer, Tropical Disease and Travel Medicine, Journal of the Canadian Medical Asssociation (recently reviewed paper on Ebola isolation protocols).
Caruso JP, Marshall P, Binninger DM. 2014. Citizen science for the 21st century ..., Grant to NSF for $1.2 million to improve high school STEM Education in FL and AZ; in revision.
Caruso JP, Marshall P, Binninger DM. 2013. Metagenomics for the masses ..., NIH R01 Grant for $890,000 to improve high school and undergraduate STEM Education in FL and AZ; in revision.
Ongoing citizen science projects on antibiotic discovery and the human skin microbiome.

Abbreviated Curriculum Vitae

Brenda J. Claiborne, Ph.D.
Professor and Program Director, Jupiter Neuroscience
Florida Atlantic University
5353 Parkside Drive, Building 19, #108
Jupiter, FL 33458
Phone: 561-400-3184; Email: brenda.claiborne@fau.edu

A. Professional Preparation

1966 - 1968	Undergraduate, University of California, Davis
1970	Bachelor of Arts, Zoology, University of California, Berkeley
1975	Master of Science, Biology, University of Oregon
1981	Doctor of Philosophy, Biology, University of California, San Diego

B. Academic Appointments

1981 - 1985	Post-doctoral Fellow and Research Associate Mentor: Dr. W. Maxwell Cowan (deceased) Developmental Neurobiology The Salk Institute for Biological Studies, La Jolla, California
1986 - 1990	Assistant Professor, Division of Life Sciences, University of Texas at San Antonio
1990 - 1997	Associate Professor, Div. of Life Sciences, University of Texas at San Antonio
1997 - 2007	Professor, Department of Biology, University of Texas at San Antonio
2007 - 2011	Professor, Department of Biology, University of New Mexico
2007 - 2011	Professor, Secondary Appointment, Department of Neurosciences School of Medicine, University of New Mexico
2011 - date	Professor, Department of Biological Sciences, Florida Atlantic University Professor, Secondary Appointment, Department of Biomedical Sciences, School of Medicine, Florida Atlantic University

Administrative Appointments

1992 - 1993	Interim Associate Vice President for Graduate Studies and Research, University of Texas at San Antonio
1993 - 1997	Dean of Graduate Studies and Associate Vice President for Research (title changed in 1996 from Associate Vice President for Graduate Studies and Research), University of Texas at San Antonio
2004 - 2007	Founding Director, UTSA Institute for Aging Research, University of Texas at San Antonio
2007 - 2011	Dean, College of Arts and Sciences, University of New Mexico
2011 - 2013	Provost and Chief Academic Officer, Florida Atlantic University
2011 – date	Program Director, Jupiter Neuroscience

C. Selected Peer-Reviewed Publications and Book Chapter (last 7 years; served as full-time administrator from 2007 - 2014)

Cunningham, R.L., B.J. Claiborne, and M.Y. McGinnis (2007) Pubertal exposure to anabolic androgenic steroids increases spine densities on neurons in the limbic system of male rats. *Neuroscience*, 150: 609-615.

Rahimi, O., and B.J. Claiborne (2007) Morphological development and maturation of granule neuron dendrites in the rat dentate gyrus. *Progress in Brain Research*, 163: 167-181.

Jacobs, G., Claiborne, B., and K. Harris (2009) Reconstruction of neuronal morphology. In *Computational Modeling Methods for Neuroscientists* (E. De Schutter, ed.), MIT Press, Cambridge, MA. pp. 187-210.

D. Selected Other Publications and Research Funding (last 7 years)

Gross, A., M. Schmidt, J. Bergdorf, R. Kroes, J. Moskal, and B.J. Claiborne, B. (2008) Lateralized gene expression patterns in the hippocampal formation of embryonic rats. *Society for Neuroscience Abstracts*, #820.16

Ybarra, N., E.J. Barea-Rodriguez, and B.J. Claiborne. (2009) Effects of Morris water maze training and testing on CA1 pyramidal neurons in GFP-expressing mice throughout senescence. *Society for Neuroscience Abstracts*, #783.10.

Barea-Rodriguez, E.J., N. Ybarra, and B.J. Claiborne (2009) Age-related cognitive impairments and morphological correlates in CA1 pyramidal neurons in GFP-expressing mice. *Society for Neuroscience Abstracts*, #783.11.

Gross, A.L., M. Schmidt, J.S. Burgdorf, R.A. Kroes, J.R. Moskal, and B.J. Claiborne (2010) Genes related to gap junction signaling are differentially expressed at embryonic day 18 in the rat hippocampal formation. *Society for Neuroscience Abstracts*, #336.1.

Claiborne, B.J., A.L. Gross, M. Schmidt, J.S. Burgdorf, R.A. Kroes, and J.R. Moskal (2010) N-methyl-D-aspartate receptor-mediated synaptic activity affects hippocampal formation gene expression patterns during early postnatal development. *Society for Neuroscience Abstracts*, #336.2

Research Funding: National Science Foundation (PI) *Development of lateralized gene expression patterns in the rodent brain* $173,387 total costs (5/1/07 to 4/30/09; Unfunded extension to 3/31/10)

E. Synergistic Activities (selected; last 7 years)

Doctoral Dissertation Supervisor:

Ybarra, N. (2009) The effects of aging on neuronal morphology and on learning and memory in male mice. Doctoral Dissertation, University of Texas at San Antonio, San Antonio, TX.

Gross, A. (2011) Development of lateralization in the rat hippocampal formation. Doctoral Dissertation, University of New Mexico, Albuquerque, NM.

Professional Service

2008	Special Review Committee, National Institutes of Health
2004 – 2009	Finance Committee, Society for Neuroscience
2005 – 2007	Board of Directors, Biomedical Research Foundation of South Texas
2011 – 2014	Treasurer-elect, Treasurer and Past Treasurer (elected), Society for Neuroscience
2011 – 2014	Council, Society for Neuroscience
2012 – 2013	Chair, Finance Committee, Society for Neuroscience
2011 – 2014	Investment Committee, Society for Neuroscience
2012 – 2013	Publications Committee, Society for Neuroscience
2014	Audit Committee, Society for Neuroscience

F. Collaborators and Other Affiliations

2004 – date: Research collaborator, Dr. Joe Moskal, Northwestern University, Evanston, IL

G. Courses Taught (last 7 years)

2007 – 2011: Department of Biology, University of New Mexico

Developmental Neurobiology Seminar, BIOL 402/502

Undergraduate Problems, BIOL 499; Senior Honors Thesis, BIOL 400; Research Problems, BIOL 551; Disseration, BIOL 699

2014 – date: Department of Biological Sciences, Florida Atlantic University

Honors Essentials of Human Anatomy and Physiology, BSC 2084

Human Neuroanatomy, BSC 4930/Honors Human Neuroanatomy, BSC 4930

Human Neuroanatomy BSC 6936

Jupiter Neuroscience Journal Club, BSC 6905

H. Community Engagement at FAU

2014 – date Board of Directors, Angel Forum of South Florida

ABBREVIATED FACULTY CV
KEN DAWSON-SCULLY

A. Professional Preparation

Post-Doctoral Fellow University of Toronto (UTM), Mississauga, Ontario Completed 2008

Ph.D.	**University of Toronto** Department of Physiology	**Completed 2003**
M.Sc.	**Queen's University** Department of Biology	**Completed 1998**
B.Sc. (Hon.)	**Queen's University** Department of Biology	**Completed 1996**

B. Appointments

2014-present

Associate Professor, tenured
Florida Atlantic University
Department of Biological Sciences
Jupiter, FL 33458 USA

2008-2014

Assistant Professor, tenure track
Florida Atlantic University
Department of Biological Sciences
Jupiter, FL 33458 USA

C. Selected Peer-Reviewed Publications

(most recent five from the last 7 years)

1. Wang R, Palavicini JP, Wang H, Maiti P, Bianchi E, Xu S, Lloyd BN, Dawson-Scully K, Kang DE, Lakshmana MK, 2014 RanBP9 Overexpression Accelerates Loss of Dendritic Spines in a Mouse Model of Alzheimer's Disease. *Neurobiol Dis*. 2014 Sep;69:169-79.
Impact Factor (2010) 5.560

2.. Palavicini JP, Lloyd BN, Hayes CD, Bianchi EB, Kang DE, Dawson-Scully K, Lakshmana MK, 2013 RanBP9 plays a critical role in neonatal brain development in mice. *PLoS ONE* 8(6), e66908.
Impact Factor (2010) 4.411

3. Milton SL, Dawson-Scully K, 2013 (Peer Reviewed Review). Alleviating brain stress: what alternative animal models have revealed about therapeutic targets for hypoxia and anoxia. 8 (3), 287-301, Future Neurology

4. Caplan, SL, Milton, SL., Dawson-Scully K, 2013. cGMP-dependent protein kinase G (PKG) activity controls synaptic transmission tolerance during acute oxidative stress 109(3):649-58, J. Neurophys.
Impact Factor (2010) 3.1

5. Ayyanathan, K, Kesaraju, S, Dawson-Scully, K, and Weissbach, H, 2012. Combination of Sulindac and Dichloroacetate Kills Cancer Cells via Oxidative Damage. PLoS ONE 7(7): e39949.
Times Cited: 3; Impact Factor (2010) 4.411

D. Selected Other Publications or Products/Grants

(most recent five from the last 7 years)

Research Grants Received

Current:

Eco Neurologics Inc., Neuroprotection via the PKG Pathway (**2013-2018**)
$353,000

Lead Investigator: Ken Dawson-Scully

E. Synergistic Activities

Editorships and Editorial Boards

Review Editor: Frontiers in Genomic Physiology, 2012-2013

Journals

Genes, Brain and Behaviour
Integrative and Comparative Biology,
Journal of Comparative Physiology A
Journal of Insect Behavior
Journal of Neurogenetics
Journal of Neurophysiology
Journal of Neuroscience
Journal of Visual Experimentation
Neuroscience
PLoS ONE
Reproductive Toxicology

Agencies

Natural Science and Engineering Research Council of Canada **NSERC**, 2014
National Aeronautics and Space Administration **NASA**, 2013, 2014
Swiss National Science Foundation **SNSF**, 2012
Canadian Foundation for Innovation **CFI**, 2010
National Science Foundation **NSF**, 2008, 2009

F. Collaborators and Other Affiliations

2013-present	Affiliate Assistant Professor, Department of Chemistry and Biochemistry, FAU, Boca Raton, FL
2012-present	Visiting Investigator, The Scripps Research Institute, Dept. of Metabolism and Aging, Jupiter FL
2010-present	Affiliate Assistant Professor, Biomedical Sciences, College of Medicine, FAU, Boca Raton, FL

G. Courses Taught

BSC 6936: Advanced Neurophysiology, Spring 2012, 2013 (co-Instructor)
PSB 6345: Neuroscience 1, Fall 2010, Fall 2011, Fall 2012, Fall 2013 (co-Instructor)
PCB 4843C/BSC 6936: Practical Cell Neuroscience, Spring 2010, 2011, 2012, 2013, 2014 (Instructor)
BSC 6905: Neuroscience Journal Club, Summer 2010, Summer 2011 (co-Instructor)
BSC 6905: Neuroscience Seminar, Fall 2009, Fall 2010, Spring 2011 (co-Instructor)
BSC 4917/4918 Honors Research/Thesis Program: Spring 2009, Fall 2009, Spring 2010, Fall 2010, Spring 2011, Fall 2011 (co-Instructor)
BSC 4930/6936: Cellular Neuroscience and Disease, Fall 2008, Fall 2009 (co-Instructor)

H. Community Engagement or Out-reach

Community/Guest Non-Research Lectures

2013	Waterford Community Center, Jupiter, FL
2013	Academic Leadership Symposium, Scripps Research Institute, FL
2012	Choosing Academia over Industry, Scripps Research Institute, FL
2011	Protecting the effects of Stroke through the use of the fruit fly, Boca Raton Rotary Club.
2011	Protecting the effects of Stroke through the use of the fruit fly, The Boca Thinkers Club, Boca Raton FL.
2008-2012	Introduction to research in the Dawson-Scully lab, Biomedical Freshmen, FAU.
2008-2012	Introduction to research in the Dawson-Scully lab, Premedical Students, FAU.
2010	CMBB last minute class filler: Anoxia research and Drosophila, FAU.
2010	Cellular Neuroscience and Disease: 1 week of basic neurophysiology lectures, FAU.

Abbreviated Curriculum Vitae

Donna Jeanne Devlin
Florida Atlantic University
(772) 242-2206
ddevlin@fau.edu

A. Professional Preparation:

Ph.D.	2004	Biology. University of Louisiana at Lafayette, Lafayette, LA
B.S.	1993	Geology. University of South Florida, Tampa, FL

B. Appointments:

April 2005-Present. Research Associate Professor, Department of Biological Sciences, FAU

July 1996 – March 2005. Visiting Scientist conducting PhD research at the National Wetlands Research Center, Lafayette, LA

Jan. 1990 – 1995. Conservation Program Coordinator, Florida Office, Center for Marine Conservation, St. Petersburg, FL

1987-1990. Artificial Reef Program Coordinator. Collier County Natural Resources Management Department, Naples, FL

1984-1986. Associate Scientist - polychaete ecology and systematics, Mote Marine Laboratory, Sarasota, FL

C. Selected Peer-Reviewed Publications:

Ilka C. Feller, Emily M. Dangremond, Donna J. Devlin, and Catherine E. Lovelock, C. Edward Proffitt, and Wilfrid Rodriguez.Nutrient Enrichment Intensifies Hurricane Damage and Prolongs Recovery in Mangrove Ecosystems in the Indian River Lagooon. Submitted Ecology.

John Paul Kennedy, Maria W. Pil, C. Edward Proffitt, Walter A. Boeger, Alice M. Stanford and Donna J. Devlin.Postglacial Expansion of the red mangrove, *Rhizophora mangle* L., in the Caribbean Sea and Florida. In internal review.

Coldren G., C.E. Proffitt, D. J. Devlin Species Diversity And Life Stage Lead To Deviations From Predictions Of The Stress Gradient Hypothesis In A Mixed Mangrove - Salt Marsh System. In internal Review

Lin Y., U. Berger, D.J. Devlin, C. E. Proffitt, J. Bodart, and I. C. Feller.2013. Identity Recognition And Developmental Plasticity In Red Mangrove Saplings: Implications for Plant Cooperation. Submitted New Phytologist

KL McKee,, Beth A Middleton, CE Proffitt and DJ Devlin. 2009. Perspectives on mosquito impoundments in eastern Florida, USA: Reply to Rey et al. Mar Ecol Prog Ser, 2009 - int-res.com

D. Selected Other Publications/Products:

Middleton, B., Devlin, D., Proffitt, C.E., McKee, K.A.,and Foster, K. 2008. Characteristics of Mangrove Swamps Managed for Mosquito Control in Eastern Florida. Marine Ecology Progress Series 371:117-128.

Upland Plants, Ferns *In* Rookery Bay Field Guide, Rookery National Estuarine Research Reserve, Florida Department of Natural Resources and National Oceanic and Atmospheric Administration

National Science Foundation EPSCoR 2010 Genetic Structure of Two Mangrove Species in the Virgin Islands and Florida. Collaborators Drs. Alice Stafford, C Edward Proffitt.

U.S. Fish and Wildlife Service, Mangrove Restoration Study 2006. This project with collaborators Drs. Edward Proffitt, Beth Middleton, and Karen McKee involved studies of the success of different methodologies of mangrove restoration in two south Florida estuaries.

E. Synergistic Activities:

Reviewer: Climate Change, Hydrobiologia, Marine Environmental Research, Wetlands, Biological Journal of the Linnean Society, Journal of Tropical Plant Biology Mississippi-Alabama Sea Grant Consortium Grants, Louisiana Board of Regents Grants, National Science Foundation

Co-authored and promoted the Agreement of Cooperation between Florida Atlantic University and Research Institute for Tropical Forestry, China

Hosted two graduate students in 2012 supported by European Union Grants from Institute of Forest Growth and Computer Science, Technische Universitat Dresden at HBOI-FAU

Hosted one graduate student 2013 supported by a European Union Grant from Université Libre de Bruxelles – ULB, Campus du Solbosch at HBOI-FAU. .

Smithsonian Research Associate 2005-Present

Mentor Summer 2014 Miami Dade College STEM Summer Interns (8) in Forest Ecology at St. Thomas University

Treasurer, Southeastern Research Society (SEERS) (Affiliate Society of Coastal and Estuarine Research Federation: CERF) 2008-2010

Organized Special Session on Climate Change, SEERS Meeting 2009, Tampa Bay, Florida

Member, National Estuaries Program/Florida Department of Environmental Protection Indian River Lagoon Spoil Island Restoration Committee. This committee helps to guide restoration by DEP on spoil islands in the Indian River Lagoon.

Member, Environmental Protection Agency (EPA) Coastal Wetlands Review Team, SE Region

Experimental Design and Statistics Advisor to Indian River Lagoon Aquatic Preserve

Participated in COSEE Florida (NSF) Science Communication Boot Camp

F. Collaborations and Other Affiliations:

E. Proffitt, FAU, Uta Berger, Institute of Forest Growth and Computer Science, Technische Universitat Dresden, Ilka Feller, Smithsonian Environmental Research Center, Sven Wagner, Institute of Silviculture and Forest Production, Technische Universitat Dresden, Franka Huth, Institute of Silviculture and Forest Production, Technische Universitat Dresden, Yue Lin Helmholtz Centere for Environmental Research, UFZ Dept of Ecological Modeling, Alice Stafford, University of the Virgin Islands, K. McKee, USGS National Wetlands Research Center, B. Middleton, USGS National Wetlands Research Center, R. Shatters, USDA Horticulture Research Lab, J. Beal, FWC. Fleur Van Nedervelde, Université Libre de Bruxelles–ULB, Campus du Solbosch, Baowen Liao, Research Institute of Tropical Forestry,CAF, People's Republic of China, Emily Dangremond, NSF Post Doc, Smithsonian Ecological Research Center.

G. Courses Taught:

Ecology Seminar, Marine Invertebrate Zoology (Graduate and Undergraduate levels) Florida Atlantic University

Co-taught Marine Ecology (Graduate level) Florida Atlantic University

Co-taught Coastal Restoration and Conservation Ecology (Graduate level) Florida Atlantic University

Co-taught Community Genetics

Oceanography, Indian River State College

H. Community Engagement or Out-Reach:

Worked with teachers and students at Frances K. Sweet Elementary Magnet School, a predominantly **minority school** to teach students and teachers about mangrove ecology and research, including organizing field trips and teaching students to tag and measure plants and record data for field experiments.

Work with undergraduate students at Indian River State College instructing them in laboratory and field techniques.

Work with undergraduates from Miami Dade College

Work with undergraduates from St Thomas University

Teach Mangroves in the Indian River Lagoon, ORCA Outreach Program

Abbreviated Curriculum Vitae 2014

NATHAN J. DORN, Ph.D.

Associate Professor
Department of Biological Sciences
Florida Atlantic University
Davie, FL 33314

ndorn1@fau.edu

A. Professional Preparation:

Ph.D. 2003 Michigan State University, East Lansing, MI
Zoology and Ecology Evolution and Behavior (dual)

B.S. 1997 Calvin College, Grand Rapids, MI
Biology

B. Appointments:

2005-2011 *Assistant Professor*
Department of Biological Sciences, Florida Atlantic University, Davie, FL

2004-2005 *Visiting Research Associate*
Southeast Environmental Research Center, FIU, Miami, FL

2003-2004 Postdoctoral Researcher
Department of Biological Sciences, Florida International Univ. Miami, FL

C. Selected Peer-Reviewed Publications (*Student Authors)**:**

Knorp*, N. E. & **N. J. Dorn**. 2014. Dissimilar numerical responses of macroinvertebrates to disturbance from drying and predatory sunfish. *Freshwater Biology* 59: 1378-1388.

Boyle*, R. A., **N. J. Dorn** & M. I. Cook. 2014. Importance of crayfish prey to nesting White Ibis (*Eudocimus albus*) populations. *Waterbirds* 37: 19-29.

Dorn, N. J. 2013. Consumptive effects of crayfish limit snail populations. *Freshwater Science* 32: 1298-1308.

Bransky*, J. W. & **N. J. Dorn**. 2013. Prey use of three wetland sunfishes: effects of ontogeny, gape size and seasonal prey variation. *Environmental Biology of Fishes* 96: 1329-1340.

Boyle*, R. A. **N. J. Dorn** & M. I. Cook. 2012. Dietary niche relationships of three species of wading birds nesting together in the Florida Everglades. *Waterbirds* 35: 154-159.

D. Selected Other Publications/Products:

Kellogg*, C. M. & **N. J. Dorn**. 2012. Consumptive effects of fish reduce wetland crayfish recruitment and drive species turnover. *Oecologia* 168: 1111-1121.

Dorn, N. J., M. I. Cook, G. Herring, R. Boyle*, J. Nelson* & D. E. Gawlik. 2011. Diet variation among White Ibis (*Eudocimus albus*) chicks: prey composition depends on recent hydrologic conditions. *Ibis* 153: 323-335.

Dorn, NJ. *Primary Investigator* - Wildlife and Nutrient Cycling Review. $6,000.00. (Jan. 2013-June 2013 South Florida Water Management District)

Dorn, NJ *Primary Investigator* - Experimental Examination of the Predator-Release Hypothesis on Wading Bird Supercolony formation in the Florida Everglades. $149,966.00. (2010-2013, South Florida Water Management District)

Dorn, NJ *Primary Investigator* - Habitat suitability models for Everglades and Slough Crayfish. $10,000.00 (2009-2010, United States Geological Survey: Joint Ecological Modeling lab).

E. Synergistic Activites:

Research/Scientific Community:

- Editorial Board Member for *Southeastern Naturalist* (2013-*present*)
- Peer Reviewer: 25 manuscripts (2008-2014)
- External Reviewer: NSF full proposal (2014)
- External Reviewer Environmental Change Initiative: University of Notre Dame (2012).
- External Reviewer for Restoration of Federal Forests in the Pacific NW: Strategies and Management Implications (administered by *The Wildlife Society* 2011)

University and College

- Member of Institutional Animal Care and Use Committee (2011-2014)
- Member of IACUC subcommittee; Wildlife use protocol development (2013-2014)
- Member of search committee for University Attending Veterinarian (2012)
- Chair of Graduate Admissions for the Environmental Sciences Program (2009-*present*)
- Member for Behavioral Ecologist faculty Search Committee (2014)
- Poster evaluator for College Research Day and ES Retreat (2014)
- Internal Review of Faculty Promotion Package (2013)

F. Collaborations and Other Affiliations:

M. I. Cook, Ph.D. South Florida Water Management District; D. E. Gawlik, Ph.D. FAU

G. Courses Taught (2008-2014)

Undergraduate-level: Principles of Ecology (3 cr., 9X), Freshwater Ecology (3 cr., 1X), Freshwater Ecology lab (1 cr., 1X), Invertebrate Zoology (3 cr., 1X), Invertebrate Zoology lab (1 cr., 1X).

Graduate-level: Advanced Ecology (3 cr., 7X), Ecological Research Seminar (1 cr., 12X; co-led).

H. Community Engagement or Out-Reach:

- Presentation/tour guide at the Loxahatchee Impoundment Landscape Assessment
- Constructed/edited Ecology questions for local Science Olympiad.

NWADIUTO ESIOBU Ph.D.
Professor of Microbiology and Biotechnology
Jefferson Science Fellow, US Department of State
Biological Sciences Department, Florida Atlantic University, Davie FL 33314; USA
Office: 954 236 1128 and 954 559 3369
Laboratory: 954 2361039; Fax: 954 236 1099
Email: nesiobu@fau.edu http://www.science.fau.edu/biology/faculty_staff/esiobu.htm

A. Professional Preparation

Post-Doctoral	Molecular biology and Biotechnology, Massachusetts Institute of Technology (MIT), Cambridge, MA USA. Boris Magasanik Laboratory.
Ph.D.	Microbiology, University of Louvain, Louvain-la-Neuve, Belgium. (Grand Distinction with Honors)
Post Grad Cert.	Agronomy (Tissue Culture & Plant pathology) University of Louvain, Belgium.
M.Sc.	Environmental Microbiology, University of Ife, Ile-Ife Nigeria. (Best graduating post-graduate student award)
B.Sc. (Hons.)	Microbiology, University of Benin, Benin City, Nigeria (Second Class Upper Division)

B. Appointments

Biotech Consultant	2013 Summer. National Biotechnology Development Agency (NABDA)
Professor	2013 - Microbiology and Biotechnology, Biological Sciences Department, Florida Atlantic University.
Senior Science Advisor	2011- Present, United States Department of State, Washington DC (Jefferson Science Fellow)
Director	2010 – Present, Microbial Biotechnology Lab., Florida Atlantic Univ.
Assoc. Professor	2003 – 2012, Dept. of Biological Sciences, Florida Atlantic University.
Professor	2009 – Present (Adjunct position) Nnamdi Azikiwe University, Nigeria
Chair	International Advisory Board, World Bank STEP B project in Nigeria.
Chair	2008 – 2012, Biological sciences department; Learning Assessment Committee, Florida Atlantic University.
Graduate Faculty	2005 – Present, Florida Atlantic University
Visiting Professor	Summer 2008, UNESCO / TWAS, Italy
Visiting Research Professor	2005-2006, Environmental Health Sciences Department, School of Public Health Dept., University of Georgia, Athens. (1 Term sabbatical)

C. Selected Peer-Reviewed Publications

Chakraborty, S. , Persaud, V. , Vanegas, S. , Gautier, G. and Esiobu, N. (2014), Analysis of the Human Oral Microbiome of Smokers and Non-Smokers Using PCR-RFLP and Ribotyping. *Advances in Microbiology*, **4**, 681-691. doi: 10.4236/aim.2014.410073.

Igwe Enerst C., N **Esiobu**, P. C. Ojimelukwe (2014) Variations in the Traditional Starter Culture for Production of a Nigerian Fermented Milk Product- (Kindirmo) Focusing on Modern Food Industry (FMFI) Volume 3 Issue 1, February 2014 www.fmfi-journal.org doi: 10.14355/fmfi.2014.0301.05

Esiobu N., Green M., Echeverry A., Bonilla T.D., Stinson C.M., Hartz A., Rogerson A. and McCorquodale D.S. (2013) High numbers of Staphylococcus aureus at three bathing beaches in South Florida. Int J Environ Health Res. 2013; 23 (1): 46 – 57. , DOI**:** 10.1080/09603123.2012.699027.

Mohammed R. L., Echeverry A., Stinson C.M., Green M., Bonilla T.D. Hartz A., McCorquodale D. S, Rogerson A. and N. **Esiobu** (2012) Survival trends of S*taphylococcus aureus*, *Pseudomonas aeruginosa*, and *Clostridium perfringens* in a sandy South Florida beach. Marine Pollution Bulletin 64 (2012) 1201–1209.

Yamazaki Koske and **Esiobu** Nwadiuto (2012) Environmental Predictors of Pathogenic Vibrios in South Florida Coastal Waters. The Open Epidemiology Journal, 2012, 5, 9-12

D. Selected Other Publications or Products/Grants

$1,478,514.00	2014 – 2016 (Co-PI) COMESA. Promotion and Improvement of Climate Smart Agriculture in Zambia through Optimized Legume-Based Agroforestry
$ 3000.00	2013- 2014 (PI) FAU Broward Undergraduate Research Grant and Faculty development (with Sarah Kudman undergraduate)
$ 50,000.00	2012 – 2013 (PI) World Bank through MAUTECH. Research skills in molecular biology, plant tissue culture and environmental biotechnology A World Bank Funded Training for Scientists from the Center of Excellence forEnvironmental Biotech, University of Maiduguri and its affiliates.
$3000.00	2012 – 2013 (PI) FAU Broward Undergraduate Research Grant and Faculty development (with Hedson Desir)
$1000.00	2013 – 2014 Broward Mentor Professional Development Award: In recognition of of efforts to promote and mentor undergraduate research
$17,500.00	2012- 2014 (Co-PI) MAUTECH (World Bank), Nigeria. Enhancement of desirable agricultural traits through plant biotechnology. Zhang X. (PI): A collaboration between FAU and MAUTECH.

Project Reports

Esiobu N. 2008 Evaluation of sporicidal properties of novel antimicrobial formulations (A Report)

Esiobu N. 2008. Lab Manual on Molecular Biology and Applied Biotech Techniques, Covenant Univ.

Rogerson A., Esiobu N., and McCoquerdale D (2003). Prevalence and survival of microorganisms in shoreline interstitial waters: Final Report submitted to the USEPA.

Esiobu N. and Rosenkranz H. (2003) Hospital Hygiene Practices for Dealing with Biowarfare agents. Final report of funded research submitted t the CBD, Tampa. 40pp

E. Synergistic Activities

* World Bank funded Centre of Excellence for Sustainable Environmental University of Maiduguri, Nigeria
* COMACO, Zambia – Agroforestry and soil conservation
* Ebonyi State University – Multi-disciplinary research skill training

F. Collaborators and Other Affiliations

National Biotech Devt Agency, NABDA; University of Maiduguri, University of Ebonyi State etc

G. Courses Taught

BSC 6390	Integrative Biology (Co-Teach as needed)
BSC 6905	Directed Independent studies
BSC 6936	Advanced Microbiology
BSC 5936	Environment and Health
BSC 4905	Directed Independent Studies
BSC 4403L	Biotechnology Labs 1
MCB 4203	Medical Bacteriology
MCB 4603	Microbial Ecology
MCB 4503	Virology
BSC 4303	Intermediate Microbiology Labs (now replaced by Biotech Lab 1)
MCB 3020(L)	General Microbiology and Labs

H. Community Engagement or Out-reach

* Jefferson Science Fellow --- US State Department
* Senior Vice President, Palm Beach-Broward Chapter of US National Committee on UN Women
* American Society for Microbiology
* Faculty mentor
* Intl. Advisory Board member, FUTY and Technical Advisory Board, Biotech Center Ebonyi
* Editorial Board member and reviewer for grants and journal articles

Evelyn Marques Frazier, Ph.D.
Department of Biological Sciences Phone: (561) 297-4472
Florida Atlantic University FAX: (561) 297-2749
777 Glades Road E-mail: efrazier@fau.edu
Boca Raton, Fl 33431

A. Profesional Preparation

Post-Doctoral	1997-1999	Universidade Federal de Minas Gearis
Ph.D. (1996)		Northern Arizona University. USA
M.S. (1991)		State University of Campinas, Brazil
B.S. (1987)		State University of Campinas, Brazil

B. Appointments

2013- present	Senior Instructor, Florida Atlantic University
2001- 2012	Instructor, Florida Atlantic University
2009 – present	Director of the Introduction to Honors and Biology Honors Thesis Progras
2000 – 2001	Visiting Professor, Florida Atlantic University
1999-2000	Adjunct Lecturer, Miami-Dade Community College

C. Selected Peer Reviewed Publications (Undergraduate Students *)

Under current name: Evelyn Frazier

Lauck, M ***.,** Owen, D. and **Frazier, E**. 2013. An analysis of the vegetation within the FAU preserve as a basis for management of scrub habitat for *Gopherus polyphemus*. Florida Atlantic University Undergraduate Research Journal. 2 (1): 7-14.

Scholl, J*.,T.Hindle and **E. Frazier**. 2012. Population structure and burrow placement of Gopherus polyphemus in a small, declining southeast Florida conservation area. FAU Journal Of Undergradaute Research, Volume 1 (1): 23-26

Maiden name: Evelyn S. A. Marques)(undergraduate students *))

Fernandes, GW., F.M.C. Castro* , M.L.Faria, **E.S.A. Marques** and M.B. Grego. 2004. Effects of Hygrothermal Stress, Plant Richness, and Architecture on Mining Insect Diversity. Biotropica 36 (2): 240-247

Riberio-Mendes, H.Nt*., **E.S.A.Marques**, I.M.Silva and G.W.Fernandes. 2002. Influence of host-plant sex and habitat on survivorship of insect galls within the geographical range of the host-plant. Tropical Zoology 15:5-15.

Marques, E.S.A., N. Cobb and P.W. Price. 2000. Resource Abundance and Insect Herbivore Diversity on Woody Fabaceous Desert Plants. Environmental Entomology 29 (4): 696-703.

D. Selected Other Publications (Undergraduate Students*)/Products

Marques, E.S.A. and P.W. Price. 1998. Altitudinal Gradients in Insect Herbivore Communities on Tropical Legumes. Brazilian Journal of Ecology 2: 66-73.

Marques, E.S.A., J. Vasconcelos-Netto and M.B. Mello*. 1998. Life History and Social Behavior of *Anelosimus jabaquara* and *Anelosimus dubiosus* (Theriddidae: Araneae). Journal of Arachnology 26: 66-76.

Price, P.W., I.R. Diniz, H.C. Morais and **E.S.A.Marques**. 1995. The Abundance of Insect Herbivore Species in the Tropics: The High Local Richness of Rare Species. Biotropica 27: 468-478.

NSF-Undergraduate Research and Mentoring Program "Integrative Biology for Future Researchers", $700,000.00, September 2008-August 2013; Co-Principal Investigator.

Small World Initiative from the Center for Scientific Teaching at Yale University 2014 – present. PI Dr. Joseph Caruso and Co Pi Evelyn Frazier. This is a program that fosters the interest of undergraduate student in research at the freshman level and is being implemented by Doctor Caruso this semester with the Non Biology majors course.

E. Synergistic Activities

Graduate Students Trained:

Ryan Ebanks Master Student in Anthropology. Forensic study on decomposition of the carrion of Sus scrofa and insect colonization. Expected graduation date Summer 2015.

Jessica Huffman – Biology Master student – 2014-2016.

Undergraduate Students Trained:

Jessica Huffman _ Undergraduate research grant 2013 – Master in Biology at FAU
Ryan Ebanks - Undergraduate research grant 2012 _ Master in Anthorpology at FAU
Dana Elhassani – Undergraduate research grant 2012
Arafat Bari Undergraduate research grant 2012
Anthony Planas Undergraduate research grant -2012 Ph.D. in Geography at FAU
Marina Lauck Undergraduate research grant – 2011 Master at Florida State University
Ariel Zeiger Undergraduate research grant 2011
Johsua Scholl - Undergraduate research grant 2010 – Phd.at Arizona State University
Angela Nenkova - Undergraduate research grant -2012
Daniela Paul - Undergraduate research grant 2012

Awards:

National Academies Summer Institute Leadership Committee (2012)
National Academies Education Fellow in the Life Sciences (2006-2008)
National Academies Education Mentor in the Life Sciences

Professional Development:

Summer Institute Leadership Committee on Undergraduate Education in Biology sponsored by the National Academies of Science and Howard Hughes Medical Institute Committee – Summer 2012

Facilitator for the Summer Institute on Undergraduate Education in Biology sponsored by the National Academies of Science and Howard Hughes Medical Institute for the Summer 2007.

Participation in the Summer Institute on Undergraduate Education in Biology sponsored by the National Academies of Science and Howard Hughes Medical Institute – Summer 2006.

Workshop on Teaching Biology to Undergraduates. Pearson/Benjamin Cummings – November 2006

F. Collaborations and Other Affiliations:

G. W. Fernandes , Federal University of Minas Gerais, Brazil
Janet Branchaw, Department of Biology Education, University of Wisconsin, Madison.

G. Courses Taught:

BSC 1010 – Biological Principles**;** BSC 1011- Biodiversity; PCB-4674 – Evolution; BSC 4905 - Introduction to Honors 1 and 2; BSC 4917- Honors Research; BSC 4918 - Honors Thesis; DIS 4905 – Life of a Scientist**;** Vascular plants (lecture and lab); Invertebrate zoology (lecture and lab); Plant Physiology (lecture and lab); Principles of Ecology

H. Community Engagement And Out-Reach

Faculty Advisor to FAU student clubs: SEEDS (Strategies for Ecology Education, Diversity and Sustainability –Chapter of the Ecological Society of America) and Council for Student Inquiry.

Participation in the FAU Quality Enhancement Plan Pilot Sudy and Faculty Learning Community.

Development and Implementation of seminar " Teaching Strategies and Mentoring Seminar" in collaboration with Geri Mayor, Laboratory Coordinator, and The Wisconsin Scientific Teaching Program.

Restructuring of Introductory Biology Courses –BSC 1010 and BSC 1011, and Evolution to include principles of Scientific Teaching as well as, active learning activities, peer discussions and problem-solving activities.

Attendance at several teaching workshops promoted by publishers.

Textbook reviewer: Pearson/Benjamin Cummings and Thompson

BioBlitz – survey of fungi, lichens, plants and animals in the FAU preserve

BIOGRAPHICAL SKETCH

Dale E. Gawlik

Professional Preparation

University of Wisconsin Stevens Point	B.S.	1984
Winthrop College	M.S.	1988
Texas A&M University	Ph.D.	1994

Appointments

2007-present	Director, Environmental Science Program, Florida Atlantic University
2013-present	Professor, Department of Biological Sciences, Florida Atlantic University
2008-2013	Associate Professor, Department of Biological Sciences, Florida Atlantic University
2003-2008	Assistant Professor, Department of Biological Sciences, Florida Atlantic University
1994-2003	Senior Environmental Scientist, Everglades Division, South Florida Water Management District
1994	Tom Slick Senior Graduate Fellow, Texas A&M University
1993-1994	Postdoctoral Research Associate, Texas A&M University
1990-1993	Graduate Research Assistant, Texas A&M University
1990	Research Supervisor, Environmental Labs Inc.
1988-1989	Biologist, Environmental Labs Inc.
1987-1988	Biological Consultant, Savannah River Ecology Laboratory
1985-1987	Graduate Research Assistant, Winthrop College
1985	Wildlife Technician, U.S. Fish & Wildlife Service, Northern Prairie Wildlife Research Center

Selected Peer-Reviewed Publications (five recent)

- Herring, G., H. K. Herring, and D. E. Gawlik. *In press*. Social cues and environmental conditions influence foraging flight distances of breeding wood storks (*Mycteria Americana*). Waterbirds
- Herring, G., C. A. Eagles-Smith, D. E. Gawlik, J. M. Beerens, and J. T Ackerman. 2014. Physiological condition of juvenile wading birds in relation to multiple landscape stressors in the Florida Everglades: effects of hydrology, prey availability, and mercury bioaccumulation. PLoS ONE 9: e106447.
- Beck, T. J, D. E. Gawlik, and E. V. Pearlstine. 2013. Community patterns in treatment wetlands, natural wetlands, and croplands in Florida. Wilson Journal of Ornithology 125: 329-341.
- Lantz, S. M, D. E. Gawlik, and M. I. Cook. 2011. The effects of water depth and emergent vegetation on foraging success and habitat selection of wading birds in the Everglades. Waterbirds 34:439-447.
- Beerens, J. M., D. E. Gawlik, G. Herring, and M. I. Cook. 2011. Dynamic habitat selection by two wading bird species with divergent foraging strategies in a seasonally fluctuating wetland. Auk 128:651-662.

Other publications or grants (five recent)

- Everglades Fellowship Program at Florida Atlantic University. Dale E. Gawlik, funded $100,000 by National Park Service, 2013-2016.
- Wood stork use of roadway corridor features in South Florida. D. E. Gawlik, funded $462,855 by Florida Department of Transportation, 2013-2016
- Feasibility of modeling impacts of sea level rise on foraging habitat of the Little Blue Heron in the Great White Heron National Wildlife Refuge, Phase II: factors affecting habitat D. E. Gawlik and B. Lapointe, funded $50,000 by U.S. Fish and Wildlife Service, 2012-2013.

- Postdoctoral investigator program in marine science, engineering and technology: effects of nutrient enrichment on wading bird habitat in the Great White Heron National Wildlife Refuge, lower Florida Keys. B. Lapointe and D. E. Gawlik, funded $112,640 by Harbor Branch Oceanographic Institute at Florida Atlantic University, 2012-2014.
- Dry season prey concentrations. D. E. Gawlik, funded $608,064 by U.S. Army Engineer Corp of Engineers Research and Development Center, 2012-2015.

Synergistic Activities

- Program Committee, 2015 Greater Everglades Ecosystem Restoration Conference, 2013-2015.
- Panelist for evaluation of Society of Ecological Restoration International Primer on Ecological Restoration. Conference on Ecological and Ecosystem Restoration, New Orleans, 2014.
- Councilor, Association of Field Ornithologists, 2013-2016.
- Science Advisory Committee, Gulf Coast Bird Observatory, Lake Jackson, Texas, 2012 – present.
- Science Advisory Committee for the Whooping Crane Eastern Partnership, U.S. Fish and Wildlife Service, 2011-present.
- President, Florida Chapter of The Wildlife Society, 2011 – 2013.
- Reviewer, Biological Status Review of Florida's Threatened Species Program, Florida Fish and Wildlife Conservation Commission, 2010.
- Dissertation Reviewer, University of New South Wales, Sydney, Australia, 2010.
- Dissertation Reviewer, University of New England, Armidale, Australia, 2010.
- Co-organized symposium entitled System-wide Science: Translating a Trophic Hypothesis Foundation for Restoration. Greater Everglades Ecosystem Restoration Conference, 2010, Naples, FL.
- Panelist, Oil and Gas Impacts in the Big Cypress Ecosystem. The Everglades Foundation, 2009-2010.

Collaborators and other affiliations

- Peter Frederick, University of Florida, Gainesville, FL
- Frank Mazzotti, University of Florida, Davie, FL
- Arnold van der Valk, Iowa State University, Ames, IA
- Joel Trexler, Florida International University, Miami, FL

Courses Taught

- Conservation Biology (PCB 6045) Developed new graduate course on the principles of Conservation Biology. Format is lecture, team projects, guest speakers, paper discussions, and a field trip.
- Seminar in Emerging Topics in Avian Ecology (Zoo 6544C) Developed new graduate course focusing on recent topics in the literature. Format is student-led discussion with introductory and synthesis lectures by the instructor.
- Principles of Ecology (PCB 4043). Taught this existing large enrollment undergraduate course required for biology majors. Format is lecture with three simulation model exercises done in teams.

Outreach

- Gawlik, D.E. 2014. Wading birds in the Everglades: graduate student research shaping the restoration of a global treasure. Jupiter High School Environmental Academy.
- Gawlik, D.E. 2013. Wading birds in Florida: cream skimmers and crumb pickers. Coastal Lecture Series, Florida Oceanographic Society, Fort Pierce, FL
- Gawlik, D.E. 2012. Habitat selection and behavior of Wood Storks and their kin in South Florida. Meeting of the South Florida Association of Environmental Professionals, Fort Lauderdale, FL.
- Gawlik, D.E. 2012. Wading birds in Florida: cream skimmers and crumb pickers. Treasure Coast Birding Festival, Vero Beach, FL.
- Gawlik, D.E. 2012. Wading birds in the Everglades: cream skimmers and crumb pickers. Pelican Island Audubon Society, Vero Beach, FL.

ABBREVIATED FACULTY CV
Tanja A. Godenschwege, Ph.D.

A. Professional Preparation

09/2004-08/2006 Research Assistant Professor, Pioneer Valley Life Sciences Institute, MA
10/1999-08/2006 Post-doctoral research fellow at the University of Massachusetts Amherst.
5/1999-9/1999 Post-doctoral research fellow & group leader at the Bayerische Julius-Maximilians Universität Würzburg.
3/1995-5/1999 Doktor der Naturwissenschaften, Department of Genetics and Neurobiology, Bayerische Julius-Maximilians-Universität Würzburg.
9/1989-2/1995 Diploma in Biology, Department of Genetics and Neurobiology, Bayerische Julius-Maximilians-Universität Würzburg.

B. Appointments

08/2011-present Associate Professor
08/2006-07/2011 Assistant Professor, Florida Atlantic University, Department of Biological Sciences, Boca Raton, Florida
Associate Director, Integrative Biology PhD Program
Faculty of the Center of Molecular Biology and Biotechnology
Affiliated Faculty, Charles E Schmidt College of Biomedical Sciences
Member of the Florida Bioinformatics Research Consortium

C. Selected Peer-Reviewed Publications

Heghinian, M. D., Mejia, M.; Adams, D.J.; Godenschwege, T. A., Mari, F. (2014), Inhibition of Cholinergic Pathways in Drosophila melanogaster by a-Conotoxins, The FASEB Journal MS ID: FASEBJ/2014/262733, *in press.*

Ermanoska B, Motley WW, LeitaoGoncaves R, Asselbergh B, Lee LH, De Rijk P, Sleegers K, Ooms T, Godenschwege TA, Timmerman V, Fischbeck KH, Jordanova A (2014) CMT-associated mutations in glycyl- and tyrosyl-tRNA synthetases exhibit similar pattern of toxicity and share common genetic modifiers in Drosophila. Neurobiol Dis. pii: S0969-9961(14)00109-0. doi: 10.1016/j.nbd.2014.04.020.

Kudumala S., Freund J., Hortsch M., Godenschwege TA (2013): Differential effects of human L1CAM mutations on complementing guidance and synaptic defects in *Drosophila melanogaster.* PLoS One. 2013 Oct 14;8(10), Impact factor 4.092

Mejia, M.; Heghinian, M. D., Busch, A.; Mari, F., Godenschwege, T. A. (2013): New tools for targeted disruption of cholinergic synaptic transmission in Drosophila melanogaster. PLoS ONE, PLoS ONE, 30;8(5).

Enneking E-M*, Kudumala SR*, Moreno E, Stephan R, Boerner J, Godenschwege TA#, Pielage J# (2013) Transsynaptic Coordination of Synaptic Growth, Function, and Stability by the L1-Type CAM Neuroglian. PLoS Biol 11(4): e1001537 doi:10.1371/journal.pbio.1001537. *** equal contribution, # corresponding authors**

D. Selected Other Publications or Products/Grants

01/03/2008-30/11/2014, National Institute of Health/NICHD (R01HD050725): "FUNCTIONAL ANALYSES OF NEUROGLIAN/L1 IN SYNAPTOGENESIS", PI: Godenschwege
07/01/2009–02/28/2014, NIH/NICHD (R01HD050725-02S1): Research Supplements to Promote Diversity in Health-Related Research, PI: Godenschwege
01/07/2009-06/30/2011, National Institute of Health/NINDS (1R21NS066371): "Efficacious Screening of Peptidic Natural Products Using Drosophila", PI: Frank Mari, Co-PI: Godenschwege
04/2013-06/2016, 2013 FAU DOR SEED Grant. "Investigation of common mechanisms of L1-type CAMs and Semaphorins interactions in cancer and neurological disorders" PI's: Vijaya Iragavarapu (Biomedical Sciences), Tanja A Godenschwege (Biological Sciences)
05/2014-06/2015, 2014 College of Science SEED Grant. Analyses of the role of full-length L1-type CAM neuroglian in the nucleus. PI: Godenschwege

E. Synergistic Activities

Course lecturer, "Neurobiology of Drosophila" summer course, Cold Spring Harbor Laboratories, 2000-2006
Graduate Student Mentor Award of the Graduate Student Association, FAU Owl Awards (2009)
Faculty mentor in the NSF Undergraduate Research and Mentoring (URM) program at Florida Atlantic University

Faculty Advisor to the Graduate and Professional Student Association in organization of GSA Research Day Spring, 2012-present

Poster judge at the Graduate and Professional Student Association Research Day Spring, 2010-2014

Owl Awards Selection Committee for the Graduate Student Association, Fall 2011

Poster judge at the College of Science Research day, 2007, 2008

F. Collaborators and Other Affiliations

Vijaya Iragavarapu (Biomedical Sciences, FAU), Jan Pielage (Friedrich Mieschner Institute, Basel), Albena Jordanova (VIB, University Antwerp), Frank Mari (Chemistry, FAU), Michael Hortsch (University of Michigan)

G. Courses Taught

Graduate Courses

PCB 6840 Cellular Neuroscience & Disease

BSC 6936 Advanced Biotechnology lab II

BSC 6846 Scientific Communication

BSC 6905 Neuroscience Colloquium and Seminar

BSC 6905 Neuroscience Journal Club

BSC 6905 Research Seminar in Neuroscience & Development

Undergraduate Courses

PCB 4842 Cellular Neuroscience & Disease

PCB 4023 Molecular and Cellular Biology

H. Community Engagement or Out-reach

Course Instructor for the "Neurobiology of *Drosophila*" summer course at the Cold Spring Harbor Laboratories, NY, (2001-2006, 2008).

Grant reviewer National Institute of Health (ad hoc panel reviewer Synapses, Cytoskeleton and Trafficking Study Section [SYN] 2011 &2012) & *National Science Foundation* (IOS – Modulation, IOS - Animal Developmental Mechanisms, MCB – Cellular Systems, IOB – Developmental Systems cluster), The Wellcome Trust-Career Re-Entry Fellowship, Parkinson's UK

Ad hoc Reviewer for Nature, Current Biology, FLY, Journal of Neurobiology, Biochimica Et Biophysica Acta (BBA), PLos Genetics, Developmental Neurobiology, Journal of Comparative Neurology, Oxford University Press, Journal Of Neurogenetics, Journal of Visual Experiments

Organizer of the "1st South Florida Drosophila Research Consortium Meeting", Senate Chamber at Florida Atlantic University (2009). "FAU/MPFI Neuroscience Symposium", Grand Palm, Florida Atlantic University (2010).

Faculty mentor in the NSF Undergraduate Research and Mentoring (URM) program at Florida Atlantic University

Session chair of the "2nd South Florida Drosophila Research Consortium Meeting", University of Miami, Florida (2010).

Poster judge at the Graduate and Professional Student Association Research Day Spring, 2010, 2011, 2012, 2013

Faculty Advisor to the Graduate and Professional Student Association in organization of GSA Research Day Spring, 2012 & 2013

Member, Owl Awards Selection Committee for the Graduate Student Association, Fall 2011

NSF MRI proposal reviewer for the Division of Research at FAU Fall 2011

Poster judge at the College of Science Research day, 2007, 2008

Abbreviated Faculty CV

James X. Hartmann, Ph.D.

A. Professional Preparation

Aquinas College, Grand Rapids, MI	B.S.	1964	Zoology
Michigan State University, E. Lansing, MI	M.S.	1967	Microbiology Immunology
Michigan State University, E. Lansing, MI	Ph.D.	1971	Virology

B. Appointments

Florida Atlantic University, Assistant Professor, Immunology/Virology1972-1977.
Florida Atlantic University, Associate Professor, Immunology, 1977-1982
Florida Atlantic University, Professor, Immunology, 1983-present.

C. Selected Peer-reviewed Publications

Keating P, Munim A, **Hartmann JX**. Effect of Vitamin D on Th9 polarized human memory cells in chronic persistent asthma. Annals of Allergy, Asthma and Immunology. 2014 Feb;112(2):154-162 PMID: 2446825

Zhang XH, Keating P, Wang XW, Huang YH, Martin J, **Hartmann JX**, Liu A. Production of Functional Native Human Interleukin-2 in Tobacco Chloroplasts. Mol Biotechnol. 2013 Oct 22. PMID: 24146433

Cavallo MF, Kats AM, Chen R, **Hartmann JX**, Pavlovic M. 2012. A Novel Method for Real-Time, Continuous, Fluorescence-Based Analysis of Anti-DNA Abzyme Activity in Systemic Lupus.
Autoimmune Dis. 2012:814048. doi: 10.1155/2012/814048. Epub 2012 Dec 5.
PMID: 23251791

Pavlovic M, Kats A, Cavallo M, Chen R, **Hartmann JX**, Shoenfeld Y. Pathogenic and Epiphenomenal Anti-DNA Antibodies in SLE. Autoimmune Dis. 2010 Jul 20; 2011:462841. PMID: 21152217

Draughon LD, Scarpa J, **Hartmann JX**. Are filtration rates for the rough tunicate Styela plicata independent of weight or size? J Environ Sci Health A Tox Hazard Subst Environ Eng. 2010;45(2):168-76. doi: 10.1080/10934520903429816. PMID: 20390856

D. Selected Other Publications/Products

Draughon, L., J. Scarpa, **P.** Keating, & **J. Hartmann**. (2008). Potential estuarine water quality improvement via marine invertebrate bioremediation. In M. Theophanides & T. Theophanides (Eds.), *Environmental* Awareness and Management (pp. 97 - 112). Athens: ATINER.

Pavlovic M, Chen R, Kats A, Cavallo M, Saccoccio S, Keating P, **Hartmann JX**. Highly Specific Novel Method for Isolation and Purification of Lupus Anti-DNA Antibody via Oligo-(dT) Magnetic Beads**.** 2007. Annals of the New York Academy of Sciences. 1108:203-217. PMID: 1789398

Ongoing Research Support: *In vitro* Study of the Immune Response to Calcifying Nanoparticles. 2012-present FAU Foundation. The goals of the project are to co-cultivate human peripheral blood cells with calcifying nanoparticles from calcinosis in lupus patients. Using gene

microarray, enzyme linked immunoassay and flow cytometry discover a means to activate dissolution of the particles. PI

Completed Research Support: Studies on the Use of Vitamin D in Asthma Patients 2006-2013 FAU Foundation. We achieved the goal of providing evidence that vitamin D down regulates an inflammatory T lymphocyte (Th9) cell that plays a key role in asthma. (see recent 2014 publication) PI

In Vitro Activation of Macrophage in Chronic Lymphocytic Leukemia 2010-2011 FAU Foundation. We sought the use of a macrophage activating factor called Gc-MAF in activating the tumoricidal properties of monocyte derived macrophages obtained from leukemia patients. PI

Lupus Research 2009-2011 FAU Foundation. We developed a real time assay for the activity of specific anti-DNA abzyme activity present in the serum of lupus patients. PI

Generation of Monocyte Derived Dendritic Cells Specific for the Idiotype of a Systemic Lupus Erythematosus Anti-DNA Antibody. 2009-2012 FAU Foundation. We sought to develop a vaccine that would selectively target the B cells producing anti-DNA antibodies in lupus patients by loading dendritic cells with the specific antibody idiotype. PI

E. Synergistic Activities

FAU, Center for Molecular Biology and Biotechnology, Member, 1998-present.

FAU, Department of Biomedical Sciences, Associate Faculty and member of the Integrative Biology Ph.D. program, 1998-present.

Master Teacher Designation, Department of Biological Sciences, FAU 2005-2010.

FAU Foundation Award, 1989.

FAU Faculty Summer Research Fellowship Award, 1989.

Fellowship from Applied Biomaterials Technologies, 1993

Fellowship from Innovative Technologies, 1993

Matching Equipment Program from IBM, Boca Raton, FL 1993

Foundation Donation for Cancer Research on the Immunotherapy of Melanoma, 1993.

The Fason Foundation Award, 1994-1996.

F. Collaborators and Other Affiliations

Dr. Amjad Munim (Pulmonologist) and Dr. Ira Pardo (Rheumatologist).

G. Courses Taught

PCB 4233 Immunology
PCB 6236 Advanced Immunology
BSC 4806 Biology of Cancer
SLS 1503 Strategies in learning success

H. Community Engagement or Out-Reach

I have been active in contacting the south Florida community to contribute significant research monies to the FAU Foundation for a number of research projects. I spent two summers in Capetown South Africa working on leukemia research.

ABBREVIATED FACULTY *CV*
Colin R. Hughes, Ph.D.

A. Professional Preparation

St. Johns College, Cambridge, B.A., 1979 Natural Sciences, Honors Degree.
Rice University, Ph.D., 1987. Major professor: Joan E. Strassmann.

B. Appointments

Research Associate with Drs J. Strassmann and D. Queller, Rice University,
July 1986 to February 1992.
Lecturer during fall semester 1989.
Research Associate with Dr. E. Bryant, University of Houston,
March 1992 to August 1992.
Assistant Professor, Biology Department, University of North Dakota,
August 1992 to August 1997.
Associate Professor, Biology Department, University of North Dakota,
August 1997 to August 1998.
Associate Professor, Department of Biology, University of Miami,
August 1998 to 2004.
Associate Professor, Department of Biological Sciences, Florida Atlantic University,
August 2004 to present.

C. Selected Peer-Reviewed Publications

Purcell, JFH; Cowen, RK; Hughes, CR, Williams DA. 2009 Population structure in a common Caribbean coral-reef fish: implications for larval dispersal and early life-history traits. Journal of Fish Biology 74: 403-417

Hughes CR, Miles S, Walbroehl JM. 2008 Support for the minimal MHC hypothesis: a parrot with a single, highly polymorphic, MHC class II *B* gene. Immunogenetics 60: 219-231.

Sachs JL, Hughes CR, Nuechterlein GL, Buitron, D 2007. Evolution of coloniality in birds: A test of hypotheses with the red-necked grebe (Podiceps grisegena) Auk 124: 628-642.

Purcell JFH, Cowen RK, Hughes CR, Williams, DA. 2006 Weak genetic structure indicates strong dispersal limits: a tale of two coral reef fish Proc. Royal Soc. Lond, Ser B.273 (1593): 1483-1490

Williams DA, Overholt WA, Cuda JP, Hughes CR. 2005. Chloroplast and microsatellite DNA diversities reveal the introduction history of Brazilian peppertree (*Schinus terebinthifolius*) in Florida Molecular Ecology 14 3643-3656

D. Selected Other Publications or Products/Grants

Szczys P, Hughes CR, Kesseli RV 2005 Novel microsatellite markers used to determine the population genetic structure of the endangered Roseate Tern, *Sterna dougallii*, in Northwest Atlantic and Western Australia Conservation Genetics 6: 461-466 2005

Sandercock BK, Beissinger SR, Stoleson SH, Melland RR, Hughes CR. 2000. Survival rates of a Neotropical parrot: implications for latitudinal comparisons of avian demography. Ecology, 81, 1351-1370.

Sachs JL, Hughes CR. 1999 Characterization of microsatellite loci for a colonially breeding population of red-necked grebes, *Podiceps grisegena*. Molecular Ecology 8, 687-688
Hughes CR, Moralez Deloach, D. 1997. Developing microsatellite loci when they are rare: trinucleotide repeat loci in the northern mockingbird *Mimus polyglottos*. Molecular Ecology 6, 1099-1102.
Strassmann JE, Gastreich KR, Queller DC, Hughes CR. 1992. Demographic and genetic evidence for cyclical changes in queen number in a neotropical wasp*Polybia emaciata*. American Naturalist 140, 363-372.
Strassmann JE, Queller DC, Solís CR, Hughes CR. 1991. Relatedness and queen number in the neo-tropical wasp *Parachartergus colobopterus*. Animal Behaviour 42, 461-470.
Queller DC, Hughes CR, Strassmann JE. 1990. Wasps fail to make distinctions. Nature 344, 388.
Strassmann JE, Hughes CR, Queller DC. 1990. Colony defense in the social wasp *Parachartergus colobopterus*. Biotropica 22,324-327.
Gastreich KR, Queller DC, Hughes CR, Strassmann JE. 1990. Kin descrimination in the tropical swarm-founding wasp, *Parachartergus colobopterus*. Animal Behaviour 40, 598-601.
Davis SK, Strassmann JE, Hughes CR, Pletscher LS, Templeton AR. 1990. Population structure and kinship in *Polistes* (Hymenoptera: Vespidae): an analysis using Ribosomal DNA. Evolution 44, 1242-1253.
Strassmann JE, Hughes CR, Queller DC, Turillazzi S, Cervo R, Davis SK, Goodnight KF. 1989. Genetic relatedness in primitively eusocial wasps. Nature 342, 268-269
Strassmann JE, Queller DC, Hughes CR. 1988. Predation and the evolution of sociality in the paper wasp, *Polistes bellicosus*. Ecology 69, 1497-1505.
Queller DC, Strassmann JE, Hughes CR. 1988. Genetic relatedness in colonies of tropical wasps with multiple queens. Science 242, 1155-1157

F. Synergistic Activities

Participant National Academies Summer Institute 2011

F. Collaborations and Other Affiliations

G. Courses Taught

Genetics, Evolution, Integrative Biology 1, Ornithology, Conservation Biology.

H. Community Engagement or Out-reach

Member Broward County Climate Change Task Force 2011-2013

ABBREVIATED FACULTY CV

Kailiang Jia, Ph.D., M.D.

A. Professional Preparation

2001	Ph.D.	Genetics	University of Missouri
1996	MSc	Medical Genetics	Chinese Academy of Medical Sciences
1993	M.D.		School of Medicine, Qingdao University

B. Appointments

2009 – present	Assistant Professor, Department of Biological Sciences, Florida Atlantic University, Boca Raton, Florida
2007 – 2009	Instructor, Department of Internal Medicine, UT Southwestern Medical Center, Dallas, Texas
2004 – 2007	Research Scientist, Department of Internal Medicine, UT Southwestern Medical Center, Dallas, Texas
2001 – 2004	Postdoctoral Associate, Division of Biological Sciences, University of Missouri, Columbia, Missouri

C. Selected Peer-Reviewed Publications

(most recent five from the last 7 years)

2014. Di Chen∗, Jiuli Zhang, Justin Minnerly, Tiffany Kaul, Donald Riddle and **Kailiang Jia**∗. *daf-31* Encodes the Catalytic Subunit of N Alpha-Acetyltransferase that Regulates *Caenorhabditis elegans* Development, Metabolism and Adult Lifespan. PLoS Genetics 10(10): e1004699. doi:10.1371/journal.pgen.1004699.
∗Corresponding authors

2014. Jiuli Zhang and **Kailiang Jia**∗. A protocol to infect *Caenorhabditis elegans* with *Salmonella typhimurium*. Journal of Visualized Experiments. (88):e51703.
∗Corresponding author

2014. Tomoyuki Sasaki, Shanshan Lian, Jie Qi, Peter Bayliss, Christopher Carr, Jennifer Johnson, Sujay Guha, Patrick Kobler, Sergio Catz, Matthew Gill, **Kailiang Jia**, Daniel J. Klionsky, and Shuji Kishi. (2014). Aberrant Autolysosomal Regulation Is Linked to The Induction of Embryonic Senescence: Differential Roles of Beclin 1 and p53 in Vertebrate Spns1 Deficiency. PLoS Genetics 10(6): e1004409. doi:10.1371/journal.pgen.1004409

2014. Alexander Curt, Jiuli Zhang, Justin Minnerly and **Kailiang Jia**∗. Intestinal autophagy activity is essential for host defense against *Salmonella typhimurium* infection in *Caenorhabditis elegans*. Developmental and Comparative Immunology. 45, 214 - 218.
∗Corresponding author

2013. Shuyi Huang, **Kailiang Jia**, Ying Wang, Zheng Zhou and Beth Levine. Autophagy genes function in apoptotic corpse clearance during *C. elegans* embryonic development. Autophagy. 9(2):138-49.

D. Selected Other Publications or Products/Grants

(most recent five from the last 7 years)

2014 – 2017	NIH, The novel role of autophagy in controlling *C. elegans* dauer recovery PI: **Kailiang Jia**
2014 – 2015	FAU College of Science Seed Grant, The novel role of autophagy in controlling *C. elegans* dauer recovery PI: **Kailiang Jia**, Co-PI Matt Gill

2012 – 2013 FAU College of Science Seed Grant, Characterize the function of *C. elegans* Arrest-defective 1 protein (ARD1) and develop an assay for drug screening of ARD1 activators
PI: **Kailiang Jia**, Co-PI Matt Gill

2010 – 2011 American Cancer Society, Characterize the function of autophagy suppressors in tumorigenesis
PI: **Kailiang Jia**, Co-PIs Michael Lu and Matt Gill

2007 – 2011 Ellison Medical Foundation, Role of autophagy in regulation of *C. elegans* life span
PI: **Kailiang Jia**

E. Synergistic Activities

- Journal Paper Reviewer: Aging Cells, Age
- Grant reviewer: AFAR
- Journal Editor: SpringerPlus
- Member of the National Scientific Advisory Council for the American Federation of Aging Research (AFAR)
- Ellison Medical Foundation New Scholar in Aging Program
- Glenn Foundation/American Federation of Aging Research Scholar
- Member of the Genetics Society of America

F. Collaborators and Other Affiliations

Collaborators: Matt Gill, The Scripps Research Institute; Anne Hart, Brown University; Shuji Kishi, The Scripps Research Institute; Beth Levine, UT Southwestern Medical Center; Donald Riddle, University of British Columbia, Canada; Zheng Zhou, Baylor College of Medicine; Predrag Cudic, Torrey Pines Institute for Molecular Studies; Herb Weissbach, FAU; Ken Dawson-Scully, FAU; Rebeca Aldunate, University Santo Tomas, Chile; Di Chen, Nanjing University, Nanjing, China

Other Affiliations

2013 – present Visiting Investigator, The Scripps Research Institute
2010 – present Center for Molecular Biology and Biotechnology, FAU

G. Courses Taught

- Molecular Genetics of Aging BSC4930, BSC6936
- Methods in Genetics BSC6936
- Genetics Lab BSC4930
- Advanced Research in Integrative Biology BSC7978
- Directed Independent Study BSC4905
- Honors Research in Biology BSC4915
- Honors Internship: Science, Math ISC4947

H. Community Engagement or Out-Reach

- Supervise students from local high and middle schools
- Annual Public Science Festival, Palm Beach Garden, FL
- Palm Beach County Science Fair and Florida State Science Fair
- Masters Broadcom Competition, *Siemens Competition* in Math, *Science* & Technology and The Intel Science Talent Search

ABBREVIATED FACULTY CV

Stephen M. Kajiura, Ph.D. Associate Professor

Biological Sciences, Florida Atlantic University, Boca Raton, FL 33431 USA

www.science.fau.edu/sharklab

A. Professional preparation

University of California at Irvine	*Ecology & Evolution*	Postdoc, 2002-2003
University of Hawaii at Manoa	*Zoology*	PhD, 2001
Florida Institute of Technology	*Marine Biology*	MS, 1994
University of Guelph	*Marine Biology*	Honours BSc, 1991

B. Appointments

2010-present Associate professor, Biological Sciences, Florida Atlantic University

2003-2010 Assistant professor, Biological Sciences, Florida Atlantic University

C. Selected Peer-Reviewed Publications (5 most recent)

Macesic, LJ & SM Kajiura. 2014. Pelvic girdle shape predicts locomotion and phylogeny in batoids. Journal of Morphology, 275: 100-110.

Siciliano*, AM, SM Kajiura, JH Long & ME Porter. 2013. Are you positive? Electric dipole polarity discrimination in the yellow stingray, Urobatis jamaciensis. Biological Bulletin, 225: 85-91. (with cover).

Bedore, CN, ER Loew, TM Frank, RE Hueter, DM McComb & SM Kajiura. 2013. A physiological analysis of color vision in batoid elasmobranchs. Journal of Comparative Physiology-A, 199: 1129-1141.

McCutcheon, SM & SM Kajiura. 2013. Electrochemical properties of lanthanide metals in relation to their application as shark repellents. Fisheries Research, 147: 47-54.

Bedore, CN & SM Kajiura. 2013. Bioelectric fields of marine organisms. Physiological and Biochemical Zoology 86(3): 298-311. (with cover).

D. Selected Other Publications

Meredith, TL & SM Kajiura. 2010. Olfactory morphology and physiology of elasmobranchs. Journal of Experimental Biology 213: 3449-3456.

McComb, DM, TC Tricas & SM Kajiura. 2009. Enhanced visual fields of hammerhead sharks. Journal of Experimental Biology 212: 4010-4018.

McGowan, DA & SM Kajiura. 2009. Electroreception in the euryhaline stingray, Dasyatis sabina. Journal of Experimental Biology 212: 1544-1552.

Kajiura, SM & KN Holland. 2002. Electroreception in juvenile scalloped hammerhead and sandbar sharks. Journal of Experimental Biology 205(23): 3609-3621.

Kajiura, SM & TC Tricas. 1996. Seasonal dynamics of dental sexual dimorphism in the Atlantic stingray, Dasyatis sabina. Journal of Experimental Biology 199(10): 2297-9306.

E. Synergistic Activities (past 5 years)

Supervised 5 PhD students, 3 MS students, 2 non-thesis MS students, 2 post-doctoral researchers, 8 undergraduate DIS students. Served on 6 MS committees, 4 PhD committees. Presented 22 invited seminars, 9 conference presentations, 26 co-authored conference presentations. Peer-reviewed 61 journal manuscripts, invited to participate in 4 scientific workshops, have 1 patent pending.

F. Collaborators and Other Affiliations (past 5 years)

CN Bedore	Duke University	JH Long	Vassar College
J Caprio	Lousiana State University	LJ Macesic	Wheaton College
SP Collin	University of Western Australia	JW Mandelman	New England Aquarium
TP Fitzgerald	Environmental Defense Fund	DM McComb	Ocean First Institute
TM Frank	Nova Southeastern University	DA McGowan	University of Washington
MS Gordon	UCLA	TL Meredith	Florida Atlantic University
A Hansen	University of Colorado	ME Porter	Florida Atlantic University
LL Harris	Florida FWCC	AM Siciliano	Duke University
NS Hart	University of Western Australia	AP Summers	University of Washington
AZ Horodysky	Hampton University	IR Tibbetts	University of Queensland
RE Hueter	Mote Marine Laboratory	TC Tricas	University of Hawaii
LK Jordan	UCLA	BE Wueringer	University of Western Australia
ER Loew	Cornell University		

G. Courses Taught

Undergraduate	Graduate
Evolution	Sensory Biology & Behavior of Fishes
Evolution in Society	Computer Graphics for Biologists
Human Anatomy	Elasmobiology
Directed Independent Study	Integrative Biology I

H. Community Engagement or Out-reach (past 5 years)

Provided on-camera appearances or technical consultation for 8 television documentaries. Provided interviews for numerous print and online media outlets locally, nationally, and internationally.

CURRICULUM VITA MARGUERITE KOCH-ROSE

Florida Atlantic University; Department of Biological Sciences
Aquatic Plant Ecology Laboratory (APEL)
777 Glades Road, Boca Raton, FL 33431-0991
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http://www.science.fau.edu/biology/koch/
https://www.facebook.com/FauAquaticPlantEcologyLab

A. Professional Preparation

Ph. D., Marine Biology and Fisheries, 1996. Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, Miami, Florida.

Graduate Exchange Scholar, 1988-1989. Geography Department, University of Exeter, Exeter, England.

M.S., Marine Sciences, 1988. Marine Sciences Department, Center for Wetland Resources, Louisiana State University, Baton Rouge, Louisiana.

Marine/Estuarine Ecology and Fisheries, 1985. University of Washington, Seattle, WA.

Coral reef ecology, 1983. West Indies Laboratory, Fairleigh Dickinson University, St. Croix, West Indies.

B.S., Biology, 1981. Biology Department, Tulane University, New Orleans, LA.

B. Appointments

C. 2008-present **Professor:** Biological Sciences Department, Florida Atlantic University, Boca Raton, FL.

D. 2001-2008 **Associate Professor:** Biological Sciences Department, Florida Atlantic University, Boca Raton, FL.

E. 1996-2000 **Assistant Professor:** Biological Sciences Department, Florida Atlantic University, Boca Raton, FL.

F. 1993-1996 **Research Associate:** Rosenstiel School of Marine and Atmospheric Sciences (RSMAS), University of Miami, Miami, FL.

G. 1989-1992 **Senior Research Scientist:** Everglades Systems Research Division, Research Department, South Florida Water Management District, West Palm Beach, FL.

H. 1988-1989 **Research Associate:** University of Exeter, England.

I. 1985-1988 **Research Assistant:** Center for Wetland Resources, Louisiana State University, Baton Rouge, LA.

J. 1985 **Research Assistant:** University of Washington, Seattle, WA.

K. 1984 **Biologist:** National Marine Fisheries Service, Bering Sea, AK.

C. Selected Peer-Reviewed Publications

Koch, M.S., C. Coronado, M.W. Miller, D.T. Rudnick, E. Stabenau, R.B. Halley, F.H. Sklar (2014) Climate Change Projected Effects on Coastal Foundation Communities of the Greater Everglades using a 2060 Scenario: Need for a New Management Paradigm. Journal of Environmental Management. DOI: 10.1007/s00267-014-0375-y

Strazisar, T., **Koch**, M., Madden, C. Seagrass (*Ruppia maritima* L.) (2014) Life history transitions in response to salinity dynamics along the Everglades-Florida Bay ecotone Estuaries and Coasts DOI 10.1007/s12237-014-9807-4.

Koch, M., Bowes, G., Ross, C., Zhang, Xing-Hai. (2013 electronic; 2014 print) Climate change and ocean acidification effects on seagrasses and marine macroalgae. Review paper: Global Change Biology 19, 103–132, doi: 10.1111/j.1365-2486.2012.02791.x

Koch, M.S., Kletou, D.C., Tursi, R. (2009) Alkaline phosphatase activity of water column fractions and seagrass in a tropical carbonate estuary, Florida Bay. *Coastal Estuarine and Shelf Science*. 83: 403-413.

Koch, M.S., Schopmeyer, S.A., Nielsen, O.I., Kyhn-Hansen, C., Madden, C.J (2007) Conceptual model of seagrass die-off in Florida Bay: Links to biogeochemical processes. 350:73-88. *Journal of Experimental Marine Biology and Ecology*.

D. Selected Other Publications or Products/Grants

Ocean acidification, temperature and light effects on carbon-use mechanisms, calcification, and growth of tropical macroalgae: Drivers of winners and losers. National Science Foundation (NSF)**. PI: $423,000.** 2014-2018.

Ruppia maritima Seed Bank Reassessment Following Large Reproductive Events in the Mangrove Transition Zone and Florida Bay. SFWMD **PI: $20,000**. 2014.

Seagrass Studies in the Mangrove Transition Zone and Florida Bay in Support of Minimum Flows and Levels and Ecosystem Restoration. SFWMD. **PI:$140,000.** 2012-2014.

FAU Climate Change Initiative Priority Theme: Research, Engineering and Adaptation to a Changing Climate: FAU. **PI: $500,000**. 2009-2014.

Seagrass research in Florida Bay in support of ecosystem models and restoration: 2009. SFWMD. **PI: $300,000**.

Germination Response of *Ruppia* seeds in Florida Bay: 2007. SFWMD. **PI: $49,600**.

Salinity, temperature, and light effects on germination success of *Ruppia maritima* in Florida Bay: 2007. A mesocosm and field study. SFWMD. **PI: $49,000**.

E. Synergistic Activities

Developing seagrass ecosystem model with colleagues at South Florida Water Management District to define water regulation schedules to Florida Bay

F. Collaborators and Other Affiliations

Collaborating with the Central Caribbean Research Center (CCMI) to develop their ocean acidification coral reef research program.

G. Courses Taught

Undergraduate: Ecology, Marine Botany Graduate: Climate Change, Marine Ecosystem Management, Coastal Plant Ecology

H. Community Engagement or Out-reach

Actively giving oral presentations and seminars to local community organizations and educational institutions on Climate Change and Ocean Acidification to promote a greater awareness of this topic.

JAMES KWASI KUMI-DIAKA DVM, PhD, DSc.(Hon)

A. Professional Preparation:

DSc. (Hon)	2013	U Science, Arts and Technology College of Medicine Montserrat, British WI	Honoris Causa
PhD	1981	A. B. U Zaria – KSU	Repro pathophysiology
MSc	1976	A. B. U Zaria – KSU	Repro pathophysiology
DVM	1974	A. B. University, Zaria, Nigeria	Veterinary Medicine
BSc	1969	U Guelph, Guelph, ON, Canada	Biology-Biochemistry
	1969/7	U Guelph, Guelph, ON, Canada	Pre-Clinical-Vet Med
Certificate	1983	A. B. U/ U Redding	Vet Economic & Epidem
	1987/90	U Guelph-OVC, ON, Canada	Post-doc/ Res. Associate
Certificate	1994	Madison Area Tech Coll Madison WI	Biotechnology

B. Appointments:

1994 – Present	Tenured Associate Professor-Biol Sciences	FAU
2007 – Present	Faculty Associate - College of Medicine	FAU
2003 – 2010	Adjunct Professor- Biomedical Program	Barry University
1990 – 1994	Visiting Associate Professor; Head of Theriogenology Div. Sch. Vet Medicine, Univ. Wisconsin, Madison WI	
1989 - 1990	Consultant - Intervet Co. Canada	Intervet Pharmaceuticals, Toronto
1987 – 1990	Post-Doc & Clinical Research Associate	Dept. of Population Medicine-OVC University of Guelph Canada
1981-1987	Assoc. Professor of Theriogenology Chair - Theriogenology Unit	A. B. University, Zaria, Nigeria
1976 – 1981	Assistant Professor of Theriogenology	A. B. University, Zaria, Nigeria

C. Selected Peer-Review Publications:

Oseni S.O*, **J Kumi-Diaka**, R Branly, J. Jebelli*, J Warrick*, H Goldsmith*. Pyroelectrically Generated Very Low Dose Ionizing Radiation Enhances Chemopreventive and Chemotherapeutic Effects of Genistein Isoflavone in Human Prostate Cancer Cells.. *J Cancer Prev Curr Res 1(2): 2014*

Shreyasee Chakraborty*, Bibiana Sandoval-Bernal, **James Kumi-Diaka**. Therapeutic Efficacy of Genistein-Topotecan Combination Compared to Vitamin D3-Topotecan Combination in LNCaP Prostate Cancer Cells. *Cell Bio*, 2013, 2, 97-104 .http://dx.doi.org/10.4236/cellbio.2013.23011

Horman V*, Dhandayuthapani S, **Kumi-Diaka J**, Rathinavelu A. Activation of the intrinsic pathway in LNCaP prostate cancer cells by genistein-topotecan combination treatment. Functional Foods in Health and Disease (FFHD), Vol. 3(3), **2013**

Dhandayuthapani Sivanesan*, Marimuthu Palanisamy*, Hormann Vanessa*; **Kumi-Diaka James**; Rathinavelu Appu. Induction of Apoptosis in HeLa cells via Caspase activation by Resveratrol and Genistein. Journal of Medicinal Food. J. Med. Food 16(2) 139-146, **2013**

Johnson M*, **Kumi-Diaka J**, Zoeller R, Graves BS, Merchant KT, Hormann V, Hassanhi M. Therapeutic efficacy of genistein-cytoreg combination in breast cancer cells. J. FFHD 2 (5):137-150, **2012**

D. Selected Other Publications or Products/Grants:

External Reviewer for National/International Journals: (21 journals)
Editorial Boards (Member, Editor, Associate Editor - eight journals)

E. Synergistic Activities:

Evaluator of Academic Curriculum in Reproduction & Physiol for Nigerian universities
Member & Consultant- IACUC: Rambaugh-Goodwin Institute of Cancer Res. 1999 to date
Member: Science Advisory Board – Int. Grp of Scientist & Medical Professionals.
Member - Network of Healthcare Advisors 2006-to date
Reviewer-Consultant Proposed Cancer Biology Text Book –Jones & Bartlett Learning/Acquisition Editor

F. Collaborators and Other Affiliations:

Apu Rathinaveli - Rambaugh-Goodwin Cancer Research Institute/ Nova Southeastern University
Manzur Hassanhi - University of Zulia, Maracaibo, Venezuela
Carlos García - Cytorex Biochemicals, Weston FL
Ephraim Linsky - Rimonest Inc./University of Haifa Haifa Israel
Leonard Girsh, MD - Immunopath Profile Inc. Naples, FL
Alberto Haces - Department of Chemistry, Florida Atlantic University

G. Courses Taught/Teaching - Currently

Cancer Biology - upper level undergraduate [APB 4594]
Immunology - upper level undergraduate [PCB 4233]
Comparative Vertebrate Morphogenesis/Embryology [ZOO 4690]
Reproductive Endocrinology - graduate course
Undergraduate Directed Independent Studies/Research [BSC 4905]
Undergraduate Honors Research [BSC 4917]
Graduate Directed Independent Studies/Research [BSC 6907]
MS Thesis Research [BSC 6905]
Graduate Seminar on Endocrinology and Phytotherapeutics

H. Community Engagement or Out-reach

1) Mentor-Broward Public School – Broward County
2) Guest speaker - Health, Science and Related Society (American Society for Cell Biology)
3) Participant/Member - Take a Stock Mentoring (Broward Public Schools Mentoring am)
4) Reviewer-Consultant for:
    a) Good Food ABC Book: - Mimi Morgenstern; published by Barnes and Noble,
    b) Good Book ABC-Read-along with Mimi: by Mimi Morgenstern: published by Barnes and Nobles.
    c) Immunology Text - by Tizard
    d) Immunology Text - by Nieto and Nieles- review for new text
    e) Immunology Text - by Peter Parham - review for 3rd edition
    f) Digital Laboratory Manual for Vertebrate Development -Wiley Publishers 2013

H. Jay Lyons, Ph.D.

Department of Biological Sciences
Charles E. Schmidt College of Science
Florida Atlantic University
2912 College Ave.
Davie, Florida 33314
Office - (954) 236-1117
Laboratory - (954)236-1189
FAX - (954) 236-1099
e-mail - hlyons@fau.edu

A. Professional Preparation

Ph.D., Medical Science, Aug, 1973. University of New Mexico, Albuquerque, NM
M.S., Zoology, Aug, 1968. Brigham Young University, Provo, UT
B.S., Zoology, June,1966. Brigham Young University, Provo, UT

B. Appointments (Since 1984)

2002 - Associate Chair, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University, Boca Raton, FL
2000 - Associate Professor, Department of Biological Sciences, Charles E. Schmidt College of Science, Florida Atlantic University, Boca Raton, Fl
1998-00 Biology Program Coordinator - College of Liberal Arts, Florida Atlantic University, Davie, Fl.
1994-97 Biology Program Coordinator - College of Liberal Arts, Florida Atlantic University, Davie, Fl.
1994-20 Associate Professor, College of Liberal Arts, Florida Atlantic University, Davie, FL
1984-94 Professor and Chairman, Department of Physiology, Southeastern University of the Health Sciences, North Miami Beach, FL
1992-93 Adjunct Faculty, Florida International University, Bay Vista Campus, College of Liberal Arts, N. Miami Beach, FL
1981-84 Associate Professor and Chairman, Department of Physiology and Pharmacology, Southeastern College of Osteopathic Medicine, North Miami Beach, FL

C. Selected Peer Reviewed Publications

Churchill, P.C., H.J. Lyons, G. Murano and F.D. McDonald. Lack of inhibition of hog renin by heparin. Nephron 22:113-116, 1978.

Lyons, H.J. and P.C. Churchill. The effect of papaverine on in vitro renin secretion. Proc. Soc. Exper. Biol. Med. 160:237-240, 1979.

Lyons, H.J. Studies on the mechanism of renin release from rat kidney slices: calcium, sodium and metabolic inhibition. J. Physiol.(London) 304:99-108, 1980.

Lyons, H.J. and H.E. Laubach. Seminal vesicle and coagulating gland growth induced by intraperitoneal inoculation of fungi in mice. Am. J. Vet. Research 50(1):32-33, 1989.

Lyons, H.J., L. Lyons, P. S. Taraskevich. Potassium-induced secretion of melanotrophs of the neurointermediate lobe of the lizard, *Anolis carolinenesis*. Journal of General and Comparative Endocrinology 116: 396 - 402, 1999

E. Synergistic Activities

University

Environmental Initiative - 1995
Broward Senate - Ad Hoc "teaching delivery" committee - 1995
Broward Faculty Senate - Steering committee 1996 - 1999

University Promotion and Tenure Committee , 2000 - 1
University Faculty Council, 2000

Charles E. Schmidt College of Science
Deans Advisory Committee - 2004 - 2008
TIP committee, 2001 – 2002
College Tenure and Promotion Committee, 2009 -

College of Liberal Arts
Interdisciplinary Studies Committee - 1994 - 1997
M.S. in Liberal Studies - 1995 -1999
Search Committee, microbiology position (chair), 1995
Search Committee, botany, 1995
Search Committee, microbiology (chair), 1996
Search Committee, visiting professor, genetics, 1996
Search Committee, genetics, 1997
Search Committee, molecular biologist, 1998
Division of Science, personnel committee (chair), 1996 -97, 1999 -2000 (chair)
CLA Web Page Committee, 1996 - 2004
CLA promotion and tenure committee, 1995 - 98, 1999 - 2001
CLA promotion and tenure committee, chair, 2001
CLA Steering Committee, 1997 - 2001
CLA Steering Committee, Chair, 1999 - 2000

Department of Biological Sciences
Departmental Personnel Committee (Co-Chair) 2006 -
Search Committee, Biology Instructor (chair) 2001
Advisor, FAU-Broward Premedical Association, 2000 -
Departmental Computer Committee - 2003 - 2008

F. Collaborations and Other Affiliations

G. Courses Taught

2006 – 2015 (1X/YR)
PCB 3703 – Human Morphology and Function I
PCB 3703L – Human Morphology and Function I Laboratory
PCB 3704 – Human Morphology and Function II
PCB 3704L – Human Morphology and Function II Laboratory

1998 – 2007 (2X/YR)
PCB 4023 – Molecular and Cellular Biology

1997 – 2005 (1X/YR)
PCB 4702 – Human Physiology

1994 – 2002 (1X/YR)
PCB 4723 – Comparative Vertebrate Physiology
PCB 4723L - Comparative Vertebrate Physiology Laboratory

1994 – 2000
ZOO 2203 – Invertebrate Zoology
ZOO 2203L - Invertebrate Zoology Laboratory

2006 – 2014
BSC 5933 – Advanced Renal Physiology
BSC 5933 - Advanced Cardiovascular Physiology

H. Community Engagement or Out-Reach

GREGORY T. MACLEOD

A. Professional Preparation

PhD	University of Sydney	1995-99	Neuroscience
MBA	AGSM - University of New South Wales	1989-90	General Management
BS Hons.	University of Sydney	1986	Plant Physiology & Biophysics
BS	University of Sydney	1983-85	Cell Biology & Plant Physiology

B. Appointments

Associate Professor	2013-present	Florida Atlantic University, Biology Dept., Jupiter, FL.
Assistant Professor	2006-13	UTHSCSA, Physiology Dept., San Antonio, TX.
Postdoctoral Fellow	2004-06	University of Arizona, Neurobiology Div., Tucson, AZ
Postdoctoral Fellow	2000-04	University of Toronto, Physiology Dept., Toronto, Canada
Postdoctoral Fellow	1999-00	University of Sydney, Physiology Dept., Sydney, Australia

C. Selected Peer-Reviewed Publications (limited to 5)

1. Wong C-O., Lin Y-Q., Chen K., Chao Y., Duraine L., Lu Z., Yoon W-H., Sullivan J-M., Broadhead G.T., Sumner C.J., Lloyd T.E., Macleod G.T., Bellen H.J. & Venkatachalam K. (**2014**) A TRPV channel in *Drosophila* motor neurons regulates presynaptic resting Ca^{2+} levels, synapse growth, and synaptic transmission. **Neuron**, *DOI: 10.1016/j.neuron.2014.09.030*

2. Ivannikov M.V. & Macleod G.T. (**2013**) Mitochondrial free Ca^{2+} levels and their effects on energy metabolism in *Drosophila* motor nerve terminals. **Biophysical Journal**, 104, 2353-2361.

3. Rossano, A.J., Chouhan A.K. & Macleod G.T. (**2013**) Genetically-encoded pH-indicators (GEpHIs) reveal activity-dependent cytosolic acidification of *Drosophila* motor nerve termini *in vivo*. **Journal of Physiology**, 591, 1691-1706.

4. Chouhan A.K., Ivannikov M.V., Lu Z., Sugimori M., Llinas R.R. & Macleod G.T. (**2012**) Cytosolic calcium coordinates mitochondrial energy metabolism with presynaptic activity. **Journal of Neuroscience**, 32, 1233–1243.

5. Chouhan A.K., Zhang J., Zinsmaier K.E. & Macleod G.T. (**2010**) Presynaptic mitochondria in functionally different motor neurons exhibit similar affinities for Ca^{2+} but exert little influence as Ca^{2+} buffers at nerve firing rates *in situ*. **Journal of Neuroscience**, 30, 1869-1881.

D. Selected Other Publications & Grants (limited to 5)

6. Sakellariou G.K., Davis C.S., Shi Y., Ivannikov M.V., Zhang Y., Vasilaki A., Macleod G.T., Richardson A., Van Remmen H., Jackson M.J., McArdle A. & Brooks S.V. (**2014**) Neuron-specific expression of CuZnSOD prevents the loss of muscle mass and function that occurs in homozygous CuZnSOD knockout mice. **FASEB Journal**, 28, 1666-1681.

7. Rawson, J.M., Kreko, T., Davidson, H., Mahoney, R., Bokov, A., Chang, L., Gelfond, J., Macleod G.T. & Eaton, E.A. (**2012**) Effects of diet on synaptic vesicle release in dynactin complex mutants: a mechanism for improved vitality during motor disease. **Aging Cell**, 11, 418-427.

8. Shakiryanova D., Morimoto T., Zhou C., Chouhan A.K., Sigrist S.J. Nose A., Macleod G.T., Deitcher D.L. & Levitan, E.S. (**2011**) Differential control of presynaptic CaMKII activation and translocation to active zones. **Journal of Neuroscience**, 31, 9093–9100.

Current Extramural Awards:

Title: The Multiple Roles of Mitochondria in Synaptic Transmission
Reference: NIH R01 NS061914
Date: 29/09/2008-06/30/2017
Granting Agency: National Institute of Neurological Disorders and Stroke (NINDS)

Title: Probing the Synapse for pH Microdomains
Reference: **NIH R21** NS083031
Date: 08/15/2013-08/31/2015
Granting Agency: National Institute of Neurological Disorders and Stroke (NINDS)

E. Synergistic Activities

Peer Review for Funding Agencies

National Institute of Health (NIH) – (CMND) 2012, 2013 (panel member)
National Science Foundation (NSF) – (IOS) 2008, 2009, 2010 (ad hoc)
– (IOS) 2011, 2012 (panel member)
American Heart Association (AHA) – (BRAIN 5) 2013 (panel member)
Italian Ministry of Health (MOH) – 2010, 2011 (ad hoc)

Peer review for Journals

Brain Research
Frontiers in Synaptic Neuroscience
Journal of Insect Physiology
Journal of Neurophysiology
Journal of Neuroscience
Neurochemistry International
Synapse

F. Collaborators and Other Affiliations

Current Collaborators and last 3 years (non-FAU only): Hugo Bellen – Baylor College of Medicine; Keith Brain – University of Birmingham, UK; Sue Brooks – University of Michigan; Ben Eaton – UTHSCSA; Barry Ganetzky – University of Wisconsin-Madison; David Krantz – UCLA; Ed Levitan – University of Pittsburgh; Rodolfo Llinas & Mutsuyuki Sugimori – NYU; Ian Meinertzhagen – University of Dalhousie, Canada; Kate O'Connor-Giles – University of Wisconsin-Madison; Shane Rea – UTHSCSA; Michael Romero - The Mayo Clinic Rochester; Thomas Schikorski – University of the Central Caribbean; Holly van Remmen – OMRF; Kartik Venkatachalam– UTHSCH; Harold Zakon – UT Austin.

Affiliated through membership with the Genetics Society of America, and the Society for Neuroscience.

G. Courses Taught

All of my teaching and supervising is at the Wilkes Honors College on the MacArthur campus at Jupiter:
- Honors Cell Biology (PCB4102) (4 credit hours)
- Honors Research in Biology (BSC4915) (1 credit hour)
- Honors Thesis in Biology (BSC4970) (3 credit hours)
- Mentoring of IB and IBAN graduate students (2 currently)

H. Community Engagement or Out-reach

Co-Director and Instructor of the 3 week *Drosophila* Neurobiology summer course at the **Cold Spring Harbor Laboratory** (CSHL): 2012, 2013, 2014.

ABBREVIATED FACULTY CV
Sarah L. Milton, Ph.D.

A. Professional Preparation

Post-doctoral Fellow: Florida Atlantic University 1995-1996: Anoxia and Physiology

Ph.D.(1994), University of Miami Rosenstiel School of Marine and Atmospheric Science, Miami, Florida; Marine Biology and Fisheries (Biological Oceanography).

B.A. Biology (1988), magna cum laude, Cornell University, Ithaca, New York; Honors: With Distinction in all Subjects.

B. Appointments

2011- Associate Professor, Biological Sciences, Florida Atlantic University
2006- 2011 Assistant Professor, Biological Sciences, Florida Atlantic University
2005- Joint appointment, Assistant Professor, Dept of Biomedical Science, FAU
2005-2006 Visiting Assistant Professor, Biological Sciences, Florida Atlantic University
1996-2005 Research Assistant Professor and Adjunct Lecturer, Florida Atlantic University
1996-1997 Adjunct Lecturer, Palm Beach Community College
1995-1996 Postdoctoral Fellow, Florida Atlantic University
1994-1995 Senior Biologist, Evans Environmental and Geological Science and Management, Inc, Miami FL
1992 – 1996 Adjunct Lecturer, Florida Atlantic University

C. Selected Peer-Reviewed Publications

Larson J, Drew KL, Folkow LP, **Milton SL**, Park TJ. 2014. No oxygen? No problem! Intrinsic brain tolerance to hypoxia in vertebrates. J Exp Biol, 217(Pt 7):1024-39.

Sifuentes-Romero, I, Merchant-Larios, M**, Milton, SL**, Moreno-Mendoza, N, Díaz-Hernández, V, and García-Gasca, A. 2013. RNAi-mediated gene silencing in a gonad organ culture to study sex determination mechanisms in sea turtle. Genes, 4(2): 293 - 305.

Caplan SL, **Milton SL**, Dawson-Scully K. A cGMP-dependent protein kinase (PKG) controls synaptic transmission tolerance to acute oxidative stress at the *Drosophila* larval neuromuscular junction. J Neurophysiol. 2013 Feb;109(3):649-58.

Milton, SL, and Dawson-Scully, K. 2013. Alleviating brain stress: what alternative animal models have revealed about therapeutic targets for hypoxia and anoxia. Future Neurology, 8(3):287-301.

Nayak G, Prentice HM, **Milton SL**. 2011. Neuroprotective signaling pathways are modulated by adenosine in the anoxia tolerant turtle. J Cereb Blood Flow Metab. Feb;31(2):467-75.

D. Selected Other Publications or Products/Grants

National Oceanic and Atmospheric Administration **Milton (PI)** 9/1/11 – 8-31/15
ECOHAB: Brevetoxin metabolism and physiology - a freshwater model of morbidity in endangered sea turtles $643,000

American Federation of Aging Research **Milton (PI)** 7/1/08 – 12/31/10
Methionine sulfoxide reductase A and resistance to oxidative damage in an animal model of aging without senescence $60,000

NIH – NIA **Milton (PI)** 8/01/09-7/31/11
Molecular mechanisms of oxidative stress resistance in an animal model of aging without senescence $213,413

Caribbean Conservation Corp **Milton (PI)** 6/1/10 – 5/31/11
Quantifying the energetic cost of disorientation in loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) hatchlings $15,957

Morris Animal Foundation **Milton (PI)** 12/1/10 – 11/30/12
Determination of Innate Immune Function in the Loggerhead (*Caretta caretta*) and Green (*Chelonia mydas*) Sea Turtle by Flow Cytometry $25,202

E. Synergistic Activities

Symposium Chair: Anatomy, Physiology, and Health. 33rd, 34th, 35th Annual *Symposium* on Sea Turtle Biology, 2013, 2014, 2015

Reviewer: textbooks and numerous journals

2013 Univ. of Miami RSMAS: Coming Full Circle: Sea turtles to stroke research and back again. Invited talk

2012 Gordon Research Congress: Brain Energy Metabolism and Blood Flow, Colby College, ME (August 2012). Modulation of reactive oxygen species in the anoxia tolerant turtle. Invited talk

2011 Tenth International Congress of Neuroethology, University of Maryland, MD. Adaptations for long term anoxia tolerance reduce oxidative stress in the freshwater turtle *Trachemys scripta*. Invited talk

F. Collaborators and Other Affiliations

NOAA, Georgia Aquarium, Florida Fish and Wildlife Service, Mote Marine Laboratory

G. Courses Taught

Comparative Animal Physiology plus Lab (UG), Anatomy and Physiology (UG), Environmental Physiology (G), Marine Animal Physiology (G). Seminar in Marine Research (G), Seminar In Hypoxia (G). Respiratory Physiology (Med), Renal Physiology (Med)

H. Community Engagement or Out-Reach

Classroom presentations on sea turtle biology: Morikami Elementary School, Boca Raton, FL, 2011.

Invited speaker Eco-Watch Lecture Series, Gumbo Limbo Nature Center, Boca Raton, FL, October 2011.

Classroom presentation (x2) on sea turtle biology and anoxia tolerance: Palmer Trinity High School, Miami, FL March, 2014

ABBREVIATED FACULTY CV
Rodney K. Murphey, Ph.D.

A. Professional Preparation

University of Minnesota, Minneapolis	Zoology	B.S., 1965
University of Minnesota, Minneapolis	Zoology	M.S., 1967
University of Oregon, Eugene	Biology	Ph.D., 1970
University of California, Berkeley	Zoology	Postdoc, 1970-1971

B. Appointments

2013–present Director, The Jupiter Life Science Initiative, Florida Atlantic University, Jupiter, FL

2006–present Chairman, Department of Biological Sciences Florida Atlantic University, FL

1994–2005 Director, Molecular and Cellular Biology Program, University of Massachusetts, Amherst, MA

1989–1994 Director, Neuroscience and Behavior Program, University of Massachusetts, Amherst MA

1987–1989 Program Director, Developmental Neuroscience, National Science Foundation, Washington, DC

1985–1989 Director, Neurobiology Research Center, State University of New York Albany, NY

1983–1987 Professor, Department of Biology, State University of New York Albany, NY

1975–1983 Associate Professor, Department of Biology, State University of New York Albany, NY

1971–1974 Assistant Professor, Department of Zoology, University of Iowa, Iowa City, IA

C. Selected Peer-Reviewed Publications

Orr, BO, Borgen, MA, Caruccio, P, Murphey, RK. (2014) Netrin and frazzled regulate presynaptic gap junctions at a Drosophila giant synapse. J Neurosci **34**(16):5416-5430.

Godenschwege TA, Murphey RK. Genetic interaction of neuroglian and Semaphorin1a during guidance and synapse formation. (2009) J Neurogenet. **23**:147-155

Uthaman, SB, Godenschwege, TA, Murphey, RK. (2008) The Drosophila ubiquitin conjugase Bendless: a developmental switch required for synaptic growth and maturation. J Neurosci **28**:8615-8623.

Allen, MJ and Murphey, RK. (2007) The chemical component of the mixed GF–TTMn synapse in Drosophila melanogaster uses acetylcholine as its neurotransmitter. Eur J Neurosci. **26**(2):439–445.

Godenschwege, TA, Kristiansen, LV, Uthaman SB, Hortsch M and Murphey, RK. (2006) A conserved role for Drosophila Neuroglian and human L1–CAM in central synapse formation. Curr Biol **16**(1):12–23.

D. Selected Other Publications or Products/Grants

Murphey, RK, Froggett, SJ, Caruccio, P, Shan-Crofts, X, Kitamoto, T and Godenschwege, TA. (2003) Targeted expression of shibirets and semaphorin1a reveals critical periods for synapse formation in the giant fiber of Drosophila. Development **130**:3671-3682.

Murphey, RK and Godenschwege, TA. (2002). New roles for ubiquitin in the assembly and function of neuronal circuits. Neuron **36**:5–8.

Godenschwege, TA, Hu, H, Shan, X, Goodman, CS and Murphey, RK. (2002). Bi–directional signaling by semaphorin1a during central synapse formation in Drosophila. Nature Neuroscience **5**:1294–1301.

Godenschwege, TA, Simpson, JH, Shan, X, Bashaw, GJ, Goodman, CS and Murphey, RK. (2002), Ectopic expression in the giant fiber system of Drosophila reveals distinct roles for Robo, Robo2 and Robo3 in dendritic guidance and synaptic connectivity. J Neurosci **22**:3117-3129.

Allen, MJ, Shan, X and Murphey, RK. (2000). A role for Drosophila Drac1 in neurite outgrowth and synaptogenesis in the giant fiber system. Mol Cell Neurosci **16**:754–765.

E. Synergistic Activities

Established an Undergraduate Mentoring and Research Program at FAU funded by the NSF (NSF# 0829250, $700,570 awarded, entitled "URM: Integrative Biology for Future Researchers", 2008-2013) to serve underrepresented students with Evelyn Frazier (FAU) as co-PI.

Founded a neuroscience group on the FAU Jupiter campus in order to develop collaborative programs with Scripps Institute (TSRI) and Max Planck Florida Institute (MPFI). Both TSRI and MPFI are based in buildings adjacent to the newly renovated FAU neuroscience building.

Experienced in administration at academic and federal institutions: 1. Program Director/PI for two successive HHMI grants during my tenure at the University of Massachusetts Amherst: HHMI Undergraduate Initiative I, 1992-1997 (total direct cost $1.2 million), and HHMI Undergraduate Initiative II, 1994-2000 (total direct cost $1.0 million) and 2. Established a Summer Program in Neuroscience for undergraduates at the University of Massachusetts Amherst through an NSF-REU Site grant (1991-1994).

Provided service to numerous neuroscience groups: 1. Program Director for Developmental Neuroscience at NSF (1987-1989) and 2. Federal grant advisory panels including NSF panels on Developmental Neuroscience, the NSF Advisory Panel to examine the Neuroscience Programs (2000), the NIH Study Section MDCN1 (1999-2004).

Organized/Chaired: Society for Neuroscience as Symposium Organizer (2003), "Delivering the Signal: Stop and Go Traffic at the Synapse", Chairman of the Gordon Conference on Neural Plasticity (1995), the NSF Committee on a neuroanatomical data base (1994) and The East Coast Nerve Net (1985–1994), at the Marine Biology Labs in Woodshole MA.

F. Collaborators and Other Affiliations

Melissa Borgen (The Scripps Research Institute, Florida), Naomi Kamasawa (Max Planck Florida Institute)

G. Courses Taught

BSC 6936 Advanced Electrophysiology Laboratory.

H. Community Engagement or Out-Reach

In the past two years I have spent considerable effort building connections to the two Biotech institutes on the MacArthur campus; Scripps Institute and Max Planck Florida Institute. This includes establishing a joint graduate program, obtaining state funds to establish a joint teaching laboratory, promoting the joint operation with the local community and developing plans to further establish the collaborative neuroscience operation.

Ramaswamy Narayanan, Ph.D.

A. Professional Preparation

B.S. in Chemistry and Physics (1972), Bombay University, India
M.S. in Clinical Biochemistry (1974), Bombay University, India
Ph. D in Biochemistry (1980), National University of Ireland, Dublin

B. Appointments

1998-present	Professor, Department of Biological Sciences
2010-present	Assistant Director, Center for Molecular Biology and Biotechnology
2007-2012	Associate Dean for Research & Industrial Relations, Charles E. Schmidt College of Science
2009-2011	Assistant Vice President for Research, FAU Division of Research
2008-2010	Chair, Department of Chemistry and Biochemistry, Charles E. Schmidt College of Science
2007-2008	Senior Assistant Vice President for Science and Technology
2006-2007	Director, Integrative Biology Ph.D. Program, Charles E. Schmidt College of Science

C. Selected Peer-Reviewed Publications

1. **Narayanan R** (2014) The Next Horizon in Proteomics and Genomics Research. MOJ Proteomics Bioinform 1(1): 00006.
2. Delgado AP, Hamid S, Brandao P, and **Narayanan R** (2014a). A Novel Transmembrane Glycoprotein Cancer Biomarker Present in the X Chromosome. Cancer Genomics Proteomics. Mar-Apr; 11 (2):81-92
3. Delgado AP, Brandao P, Chapado M, Hamid S and **Narayanan R** (2014b). Open reading frame associated with cancer in the dark matter of the human genome. Cancer Genomics and Proteomics. 11: 201-214
4. Delgado AP, Brandao P and **Narayanan R** (2014 c)**.** Diabetes Associated Genes from the Dark Matter of the Human Proteome. MOJ Proteomics Bioinform 1(4) :00020
5. Delgado AP, Brandao P and **Narayanan R** (2013). Mining the dark matter of the cancer proteome for novel biomarkers. Current Cancer Therapy Reviews, 9, 1-13 1W

D. Selected Other Publications or Products/Grants

Narayanan R. (2014) Healthy Genome: A Myth or A Paradigm Shift in Bioinformatics Research? MOJ Proteomics Bioinform.1(4): 00023
Narayanan, R. and Van De Ven W im JM. Transcriptome and Proteome Analysis: A Perspective on Correlation. MOJ Proteomics Bioinform 1 (5): 00027

Patents:
1. Methods of detecting a colon cancer cell. US patent approved **(6,677,119).**

2. Association of ***SIM2*** with cancer. US patent approved (6,780,642)

Grants:

1. **MBRS Support of Continuous Research Excellence at FAU**

Grant Number: 5S06GM073621-04 REVISED, Project Period: 06/08/2005 – 05/31/2009. No cost extension 5/31/2009-6/31/2010|Direct costs: $4M|Agency: NIGMS | Role: **PI**

2. Agency: **American Cancer Society Institutional Grant, IRG 08-063-01:** Period, direct costs: 1/2008-12/31,2011, $180,000| Role: **PI**

E. Synergistic Activities

Editorial Board:

1994-present: Antisense Research & Development; In Vivo
1995-present: Anticancer Research
2004-present: Current Cancer Therapy Reviews
2004- present: The Open cancer Journal
2014- present: MOJ Proteomics and Bioinformatics (Editor)

Reviewer: Cancer Research, Cancer, Experimental Cell Research, Science, Nature Medicine, Nature Biotechnology, Bioinformatics, Journal of Immunology, Antisense Research and Development, Proceedings of the National Academy of Sciences, Journal of Biological Chemistry, Molecular and Cellular Biology, BioMed Central, EMBO Journal.

F. Collaborators and Other Affiliations

Dr. John Delinasios, International Institute of Anticancer Research (IIAR), Attiki, Greece
Dr. W.J.M. Van de Ven, University of Leuven, Belgium
Dr. Pranela Rameshwar, UMDNJ-New Jersey Medical School
Dr. Tsippi Iny Stein, Weizmann Institute of Science, Israel

G. Courses Taught

BSC6458C Applied Bioinformatics (4 Credits)
BSC4930 Concepts in Bioinformatics (2 Credits)
BSC6905 Directed Independent Study (3 Credits)
Masters Thesis (3-6 credits)
BSC 6946 Advanced Research in Bioinformatics (3 Credits)
BSC 6936 Molecular Perturbations in cancer (3 Credits)
BSC6936 Cancer Proteomics (3 Credits)
BSC6936 R- Programming and Bioinformatics (3 Credits)

H. Community Engagement or Out-Reach

FAU Representative to BioFlorida (Board Member)
Life Sciences Steering Committee of the Palm Beach County Business Development Board
Steering Committee of the South Florida I-95 Life Science Corridor Initiative

Erik G. Noonburg, Ph.D.
ABBREVIATED FACULTY CV

A. Professional Preparation

A.B. 1994	University of Chicago. Biology (with honors).
Ph.D. 2000	University of California, Santa Barbara. Department of Biological Sciences.
2000-2003	Postdoctoral Fellow, University of Toronto, Dept. of Zoology.
2003-2005	Postdoctoral Fellow, University of Alberta, Centre for Mathematical Biology.
2005-2006	Research Associate, University of California, Santa Barbara, Dept. of Ecology, Evolution, and Marine Biology.

B. Appointments

2006-2012. Assistant Professor, Dept. of Biological Sciences, FAU.
2012-present. Associate Professor, Dept. of Biological Sciences, FAU.

C. Selected Peer-Reviewed Publications

Naudot, V., Noonburg, E.G. 2013. Predator-prey systems with a general non-monotonic functional response. *Physica* D, 253: 1-11.

Welicky, R.L., Wyneken, J., and Noonburg, E.G. 2011. A retrospective analysis of sea turtle nest depredation patterns. *Journal of Wildlife Management*, 76:278-284.

Noonburg, E.G., Nisbet, R.M., and Klanjscek, T. 2010. Effects of life history variation on vertical transfer of toxicants in marine mammals. *Journal of Theoretical Biology*, 264: 479-489.

Shima, J.S., Noonburg, E.G., and Phillips, N.E. 2010. Life history and matrix heterogeneity interact to shape metapopulation connectivity in spatially structured environments. *Ecology*, 91: 1215-1224.

Byers, J.E., and Noonburg, E.G. 2007. Poaching, enforcement, and the efficacy of marine reserves. *Ecological Applications*, 17:1851-1856.

D. Selected Other Publications or Products/Grants

Beerens, J., Noonburg, E.G., and Gawlik, D.E. 2013. Wading Bird Evaluation Team/Assessment Team Model Integration and Development. Final report to the U.S. Army Corps of Engineers.

Van der Heiden, S., Owen, D., and Noonburg, E.G. 2010. Tree Islands – Surrounding Marsh Eco-Hydrologic Relationship: Soil Thickness and Plant Species Composition on Tree Islands in the Central Everglades. Final Report to the South Florida Water Management District.

Volin, J., Noonburg, E.G., Volin, V. and Owen, D. 2008. Development of a Sampling Prioritization Model to Optimize the Selection of Tree Islands in WCA-3A and 3B for Surveying of *Lygodium microphyllum*. Final Report to the Florida Fish and Wildlife Conservation Commission.

E. Synergistic Activities

Reviewer for: American Naturalist, Conservation Biology, Ecological Applications, Ecology, Ecology Letters, Journal of Animal Ecology, Oecologia, PLoS Biology, Proceedings of the Royal Society B, Theoretical Ecology, Theoretical Population Biology.

F. Collaborators and Other Affiliations

Recent collaborators:
V. Naudot, Dept. of Mathematical Sciences, FAU
J. Byers, Odum School of Ecology, U. of Georgia
J. Shima, School of Biological Sciences, Victoria University of Wellington, New Zealand
S. Swearer, Dept. of Zoology, U. of Melbourne, Australia

G. Courses Taught

EVS 6920 Environmental Sciences Colloquium
PCB 6406 Ecological Theory
BSC 6937 Ecology Research Seminar
STA 3173 Introduction to Biological Statistics

H. Community Engagement or Out-Reach

Science Communication Fellow, Patricia & Phillip Frost Museum of Science

MARIANNE EVELYN PORTER
CURRICULUM VITAE

Department of Biology
Florida Atlantic University
777 Glades Rd.
Boca Raton, FL 33431

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A. Professional Preparation

2007	PhD, Ecology and Evolutionary Biology, University of California, Irvine
2002	MS, Biology, Northern Arizona University
2000	BS, Zoology, Northern Arizona University

B. Appointments

2014 – present	Assistant Professor, Biology, Florida Atlantic University
2013 Fall	Visiting Assistant Professor, Florida Atlantic University
2012 Fall	Visiting Lecturer, Friday Harbor Labs, University of Washington
2011 - 2013	Affiliate Research Assistant Professor, Department of Biological Sciences, Florida Atlantic University
2009 – 2013	Faculty Research Associate, Department of Biology, Vassar College
2008 – 2009	Postdoctoral Research Associate and Visiting Assistant Professor, Vassar College

C. Selected Publications

Undergraduate collaborators are underlined

– **Porter, M.E.**, C. Diaz Jr., J.J. Sturm, S. Grotmol, A.P. Summers, and J.H. Long Jr. 2014. Built for speed: Strain in the cartilaginous vertebral columns of sharks. Zoology. 117: 19-27.

– Siciliano, A.M. ,J.H. Long Jr., S.M. Kajiura, and **M.E. Porter**. 2013. Are you positive? Electric dipole polarity discrimination in the yellow stingray, *Urobatis jamaicensis*. Biological Bulletin. 25: 85-91.

– **Porter, M.E.,** C.M. Roque, and J.H. Long Jr. 2011. Body form and posture predict the performance of leopard sharks (*Triakis semifasciata*) in yaw turning. Zoology. 114: 348-359.

– Long, J.H., Jr., T.J. Koob, J.T. Schaefer, A.P. Summers, K. Bantilan, S. Grotmol, and **M.E. Porter**. 2011. Inspired by sharks: a biomimetic skeleton for the flapping, propulsive tail of an aquatic robot. Marine Technology Society Journal. 45(4): 119-129.

– Rosenblum, H.G., J.H. Long Jr, and **M.E. Porter**. 2011. Sink and swim: kinematic evidence for axial undulatory and lifting-body mechanisms in negatively-buoyant electric rays (*Narcine brasiliensis*). The Journal of Experimental Biology. 214: 2935-2948.

D. Other Publications or Grants

– NSF. (IOS-0922605, 9/1/2009 – 8/31/2013). Computational and Experimental Biomechanics: Modeling the Non-linear Viscoelastic Behavior of the Vertebral Column of Swimming Elasmobranchs. John Long (PI), **Marianne Porter** (co-PI) and Robert Root (co-PI). $400,000

– **Porter, M.E.** and J.H. Long Jr. 2010. Vertebrae in Compression: Mechanical Behavior of Arches and Centra in the Gray Smooth-hound (*Mustelus californicus*). Journal of Morphology. 271 (3): 366-375.

– **Porter, M.E.**, C.M. Roque, and J.H. Long Jr. 2009. Turning maneuvers in sharks: predicting body curvature from vertebral morphology. Journal of Morphology. 270: 954-965.

– **Porter, M.E**., T.J. Koob, and A.P. Summers. 2007. The contribution of mineral to the material properties of vertebral cartilage from the smooth-hound shark *Mustelus californicus*. The Journal of Experimental Biology. 210: 3319-3327. Featured article in *Inside JEB*.

– Porter, M.E., J.L. Beltrán, T.J. Koob, and A.P. Summers. 2006. Material properties and biochemical composition of mineralized vertebral cartilage in seven elasmobranch species (Chondrichthyes). The Journal of Experimental Biology. 209:2920-2928.

E. Courses Taught

BSC 2086	Anatomy and Physiology 2, Florida Atlantic University
BSC 2085	Anatomy and Physiology 1, Florida Atlantic University
Marine Biology Quarter	Marine Biology Research Experience, fall quarter, Friday Harbor Labs, University of Washington
Bio Sci 136	Human Anatomy Lecture, five week summer course, UC, Irvine, taught three summers
Bio Sci 281	Comparative and Functional Anatomy of Vertebrates Lecture and Lab, Vassar College, taught one semester
Bio Sci 106	Introduction to Biological Investigations Lecture and Lab, Vassar College, taught one semester

F. Synergistic Activities

University

2012	Student research day. Florida Atlantic University. Poster judge
2009	Robotics Competition Judge, Vassar College

Society

2013	Society of Integrative and Comparative Biology, judge of student papers for Division of Comparative Biomechanics and Division of Vertebrate Morphology at annual meeting
2013	Society of Integrative and Comparative Biology, session moderator at annual meeting
2012 - 2015	Society of Integrative and Comparative Biology, Student Support Committee
2010-2012	Society of Integrative and Comparative Biology, Division of Comparative Biomechanics graduate student / postdoc representative
2011	Society of Integrative and Comparative Biology, Symposium Organizer for annual meeting, sponsored by three society divisions

H. Community Engagement or Outreach

2010-2011	Vassar Science Scholars Program for Poughkeepsie High School science students
2010	Vassar Science Scholars Program for Poughkeepsie High School science students
2008	Duchess County Science Fair, Judge
2007	Costa Mesa High School, Ask a Scientist Afternoon
2004-2007	Irvine Unified School District Science Fair, Judge
2004-2007	Irvine Unified School District, Ask a Scientist Night
2004	James Irvine Intermediate School Career Exploration Day

PEER REVIEW

2007-2014	18 journals

REFERENCES

Available upon request.

Michael Salmon, Ph.D.
Research Professor

A. Professional Preparation

Earlham College	1955-1959	A. B. 1959
Univ. of Maryland	1959-1964	M. S. 1962 Ph.D. 1964 (H.E. Winn, thesis advisor)

B. Appointments

NIH Postdoctoral Fellow, 1964-65, University of Hawaii
Assistant Professor, 1965-1967, De Paul University, Chicago Ill.
Assistant to Full Professor, 1967-1989, University of Illinois, Urbana-Champaign
Professor and Chair, Biological Sciences, 1990-1992, Florida Atlantic University, Boca Raton
Professor, Biological Sciences, 1992 – 2002, Florida Atlantic University, Boca Raton
Research Professor, 2003-present, Florida Atlantic University, Boca Raton

C. Selected Peer-Reviewed Publications

Salmon, M., Carthy, R.R., Lohmann, C.M.F., Lohmann, K.J., & Wyneken, J. 2012. Collecting a sample of loggerhead sea turtle hatchlings before a natural emergence does not reduce nest productivity. Endangered Species Research 16:295-299.

Salmon, M. & Scholl, J. 2014. Allometric growth in juvenile marine turtles: possible role as an antipredatory adaptation. Zoology 117:131-138.

Reintsma N., Young, M., & Salmon, M. 2014. Do lighthouses disrupt the orientation of sea turtle hatchlings? Hypothesis testing with arena assays at Hillsboro Beach, Florida, U.S.A. Marine Turtle Newsletter 140:1-3.

Stadler M., Salmon, M., & Roberts, C. 2014. **Ecological correlates of green turtle (*Chelonia mydas*) abundance on the nearshore worm reefs of southeastern Florida (*in press,* Journal of Coastal Research)**

Salmon, M. & M. Reising*. 2014. (Commentary) Emergence rhythms of marine turtles: Is a time sense involved? (*in press,* Chelonian Conservation and Biology)

D. Selected Other Publications or Products/Grants

Chung, F.C., Pilcher, N. J., Salmon, M. & Wyneken, J. 2009. Offshore migratory activity of hawksbill *(Eretmochelys imbricata* L) hatchlings. I. Quantitative analysis of activity, with comparisons to green turtles (*Chelonia mydas* L). Chelonian Conservation and Biology 8:28-34.

Chung, F. C., Pilcher, N. J., Salmon, M. & Wyneken, J. 2009. Offshore migratory activity of hawksbill *(Eretmochelys imbricata* L) hatchlings. II. Swimming gaits, swimming speed, and morphological comparisons. Chelonian Conservation and Biology 8:35-42.

Smith, M.M. & Salmon, M. 2009. A Comparison between the habitat choices made by hatchling and juvenile green turtles (*Chelonia mydas*) and loggerheads (*Caretta caretta*). Marine Turtle Newsletter 126:9-13.

Salmon, M., Hamann, M., Wyneken, J. & Schuable, C. 2009. Early swimming activity by hatchling flatback sea turtles (*Natator depressus*): A test of the "predation risk" hypothesis. Endangered Species Research 9:41-47.

Salmon, M., Hamann, M., & Wyneken, J. 2010. The development of early diving behavior by juvenile flatback sea turtles (*Natator depressus*). Chelonian Conservation and Biology 9:8-17.

Merrill, M.M. & Salmon, M. 2010. Magnetic orientation by hatchling loggerhead sea turtles (*Caretta caretta*) from the Gulf of Mexico. Marine Biology 158:101-112.

Mott, C.M & Salmon, M. 2011. Sun compass orientation by juvenile green sea turtles (*Chelonia mydas*). Chelonian Conservation and Biology 10:73-81.

Young, M., Salmon, M., & Forward, R. 2012. Visual wavelength discrimination by the loggerhead turtle, *Caretta caretta*. Biological Bulletin (Woods Hole) 222:46-55.

E. Synergistic Activities

I serve on the Master's committees of several graduate students working with other faculty; I am chair of the Scholarship Committee and try to match student projects with sources of outside funding.

F. Collaborators and Other Affiliations

Collaborations with faculty at Duke University, University of Malaysia, James Cook University (Australia)

G. Courses Taught

I no longer teach courses but give guest lectures in classes taught by colleagues.

H. Community Engagement or Out-Reach

I work closely with personnel at the Gumbo Limbo Nature Center, and the National Save the Sea Turtle Foundation (NSTSTF), where I also serve as science editor for their natural history magazine, *Environmental Outreach.* I am a frequent contributor to that magazine and actively recruit other scientists who also write articles of interest to its readership.

Thanks to my efforts, the NSTSTF recently contributed $85,000 to the renovation of the FAU Marine Laboratory, with more funding to come next year.

MARY JANE SAUNDERS, Ph.D.

A. Professional Preparation

B.A. Biology	Boston University	1972
M.S. Botany	University of Massachusetts	1980
Ph.D. Botany	University of Massachusetts	1982
Postdoctoral	University of Georgia	1982-1983

B. Appointments

Florida Atlantic University	Professor	2010-
	President	2010-2013
Cleveland State University	Provost	2007-2010
	Interim Provost	2006-2007
College of Science	Interim Dean and Dean	2004-2006
Biomedical and Heath Institute	Director	2003-2004
Department of Biological, Geological and Environmental Sciences	Professor	2003-2010
National Science Foundation	Deputy Division Director	2000-2001
	Program Officer	1999-2000
University of South Florida		
Institute of Biomolecular Science	Director	1993-2001
Biology Department	Asst., Assoc. Professor	1986-2003
Louisiana State University		
Botany Department	Assistant Professor	1983-1986

C. Selected Peer-Reviewed Publications

Ludlow III, J. M.; Xie, T.; Guo, Z.; Guo, K.; Saunders, M. J.; Moorefield, C. N.; Wesdemiotis, C.; Newkome, G. R. Part 257*. "Self-assembly of a hexa*kis*terpyridinyl-functionalized tribenzo-27-crown-9 ether into a novel expanded tetrahedral construct", TBD, 2014.

Sarkar, R.; Kai, G.; Moorefield, C. N.; Saunders, M. J.; Wesdemiotis, C.; Newkome, G. R. Part 252*. "One-step, Multicomponent, Self-assembly of a First-Generation Sierpiński Triangle: From a Fractal Design to Chemical Reality," *Angew. Chem. Int. Ed*., 2014, accepted, in press; DOI 10.1002/anie201407285.

D. Selected Other Publications or Products/Grants and E. Synergistic Activities

Administrative Experience

President Florida Atlantic University

A large public, comprehensive institution, FAU is currently serving more than 30,000 undergraduate and graduate students on seven campuses along more than 100 miles of Florida's southeastern coastline in Broward, Palm Beach and St. Lucie counties. Established in 1961 as a member of Florida's State University System, FAU offers more than 180 degree programs through10 colleges. FAU has an annual budget of $600 million and 4,000 full and part time employees. Personal accomplishments include:

- Led the process of creating the 2012-17 Strategic Plan, which establishes Florida Atlantic University's three signature themes: Marine and Coastal Issues, Biotechnology, and Contemporary Societal Issues.
- Doubled "first-time-in-college" applications from 12,000 to 24,000 in 2011; incoming

class in Fall 2012 was the largest in FAU history and had highly competitive SAT and ACT scores; FAU became the most selective institution in the SUS. The student body reached an all-time high of 30,000-plus in Fall 2012.

- Led the Southern Association of Colleges and Schools (SACS) reaffirmation process, which earned the University the highest possible overall evaluation and special praise for our Quality Enhancement Plan, "Distinction through Discovery."
- Launched the Charles E. Schmidt College of Medicine, including establishing preceptorships with 900 physicians, partnerships with 8 hospitals for Med 3+4 clinical rotations, and a consortium with 5 hospitals for 340 new post-graduate residencies.
- Opened the following new academic facilities in 2011 and 2012 (on time, under cost and LEED-certified):
    - Engineering East Building; LEED Platinum; $46.4 million
    - Culture & Society Building; LEED Gold; $25.6 million
    - Henderson School Expansion; LEED Gold; $6 million
    - Davie West; LEED Gold; $36.2 million
    - HBOI Link Building Renovation; LEED Gold; $9.5 million
    - Innovation Village Student Residence Complex, Phase I; LEED Silver; $99 million (Occupancy 100%)
    - FAU Stadium; LEED Silver; $63.5 million
    - Harbor Branch Research Lab II: LEED Silver; $19.3 million
- Initiated the construction of the following facilities in:
    - Freshman Residence Hall; $41.7 million
    - Expansion of Louis & Anne Green Memory & Wellness Center; $1.8 million
    - Parking Garage III; $13.3 million
    - Expansion of Centre Marketplace; $4 million
    - Expansion of Recreation Center; $1 million
- Grew sponsored research funding from $37.5 million in 2009-10 to $43.2 million in 2010-11 to $48 million in 2011-12, for a three-year total of $128.7 million.
- Balanced budgets of $600 million every year.
- Created the Center for eLearning to increase the University's competitiveness in the rapidly expanding online education arena.
- Established the Center for Teaching and Learning, a multi-departmental initiative to ensure the academic success of every student and provide faculty with teaching tools and resources.
- With university and business partners, launched Life Sciences South Florida and MedUTech, two promising new high-tech industry/university economic development initiatives.

G. Courses Taught

BSC 1005 Life Sciences Fall 2014

BSC 4930 Plant Cell Biology Spring 2015

BSC 6930 Plant Cell Biology Spring 2015

H. Community Engagement or Out-Reach

Increased outreach to the business community through creation of the Division of Community Engagement as FAU President.

Abbreviated Curriculum Vitae 2014

Timothy Charles Theisen, Ph.D.
Faculty Instructor, Department of Biological Sciences
Florida Atlantic University
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http://www.science.fau.edu/biology/faculty_staff/Theisen.htm

A. Professional Preparation:

- Ph.D. (2007) FAU, Davie, Florida Atlantic University, Integrative Biology (fisheries and marine science)
- B.S. (2000) FAU, Davie, Florida, Biology (marine)

B. Appointments:

- **2007 - Present:** Faculty Instructor, FAU, Department of Biological Sciences
- **2003 - 2007:** Research Assistant, FAU
- **2001 - 2007**: Teaching Assistant, FAU

C. Selected Peer-Reviewed Publications:

- **Theisen TC** and Baldwin JB (2012) Movements and depth/temperature distribution of the ectothermic Scombrid, *Acanthocybium solandri* (wahoo), in the western North Atlantic. Marine Biology **157**(10), 2249-2258.
- **Theisen TC** (2009) Report on the status of walleye pollock (*Theragra chalcogramma*) and its fisheries in the eastern Bering Sea and Gulf of Alaska. Seafood Watch seafood report, Monterey Bay Aquarium, San Francisco.
- **Theisen TC**, Bowen B, Lanier W and Baldwin JB (2008) High connectivity on a global scale in the pelagic wahoo, *Acanthocybium solandri* (tuna family Scombridae). Molecular Ecology **17**, 4233-4247.
- **Theisen TC** (2008) Report on the status of Pacific cod (*Gadus macrocephalus*) and its fisheries. Seafood Watch seafood report, Monterey Bay Aquarium, San Francisco.

D. Selected Other Publications or Products/Grants:

- Bowen B and **Theisen TC** (2008) Global population structure of the wahoo. Pelagic Fisheries Research Program Principal Investigators Workshop, Waikiki, Hawaii. Presentation by Bowen B.
- **Theisen TC** and Baldwin JB (2006) Movement patterns and environmental preferences of wahoo, *Acanthocybium solandri.* 59th Annual Meeting, Gulf and Caribbean Fisheries Institute, Belize City, Belize. Presentation by Theisen TC.
- **Theisen TC (PI)** and Whitehurst M (Co-PI). Validation of a new protocol for field measurements of standard metabolic rate in fish. Charles E Schmidt College of Science Faculty Seed Grant, $4,850.00. 2014–2015.
- Baldwin JB (PI) **and Theisen TC (Co-PI).** Movements and depth/temperature distribution of wahoo (*Acanthocybium solandri*) in the western North Atlantic. Institute for Wildlife Science Foundation, $15,000.00. 2009-2011.
- Baldwin JB (PI) and **Theisen TC**. Optimization of a satellite tagging protocol to describe movement patterns and habitat utilization of wahoo, *Acanthocybium solandri*, $15,000.00. 2007-2009.

- **Theisen TC**. Palm Beach County Fishing Foundation Award, $3,000.00. 2006.
- **Theisen TC**. FAU Graduate Scholarship in Marine Science Award, $5,000.00. 2006.
- **Theisen TC**. FAU Graduate Scholarship in Conservation Biology Award, $3,000.00. 2005.

E. Synergistic Activities:

Service:

- Personnel Review Committee
- Bylaws Review Committee
- Promotion and Tenure Policies Review Committee
- Committee to Review Changes to Molecular Genetics and Molecular Biology Courses
- Hiring Committee, Lab Manager and Assistant Lab Manager

Professional Associations:

- American Fisheries Society
- Gulf and Caribbean Fisheries Institute
- Jupiter Inlet Offshore Fishing Club (honorary)

Research Experience:

- Deployment of pop-up satellite tags (PSAT's) onto marine fish; implementation of a program utilizing PSAT's to investigate movement patterns and temperature / depth profiles of marine fish
- Collection of DNA from tissues, generation and analyses of DNA sequence data to describe population genetic structure and phylogeography of highly mobile, pelagic marine fish
- Collection of DNA from tissues, generation and analyses of DNA sequence data and wildlife tag data to investigate distribution of terrapins within Florida Bay
- Analyses of factors affecting growth rates in cultured coral species to be used for regeneration of damaged natural coral reefs

Field Experience:

- Collection of live fish, reptiles, and invertebrate specimens for preservation and for tag and release
- Collection of tissue samples for DNA analyses from a variety of organisms
- Removal of otoliths and other hard parts from marine fish for age and growth studies
- Removal of gonads from marine fish for reproductive studies

F. Collaborations and Other Affiliations:

G. Courses Taught:

Lecture Courses: BSC 5931 Genetic Sequencing and Analyses; PCB 4723 Comparative Animal Physiology; OCB 4043 Marine Biology; PCB 4023 Molecular and Cell Biology; PCB 3063 Genetics

Laboratory and Field Courses: ZOO 6456L Natural History of Fishes; BSC 4403L Biotechnology Laboratory I; BSC 4428L Biotechnology Laboratory II; OCB 4043L Marine Biology Lab; MCB 3023L Microbiology Lab; ZOO 2203L Invertebrate Zoology Lab

Seminar Courses: ZOO 6459 Graduate Seminar in Ichthyology

Guest Lectures: BSC 6936 Ecosystem Based Management; BSC 6390 Integrative Biology

H. Community Engagement or Out-Reach:

ABBREVIATED FACULTY CV

Herbert Weissbach, Ph.D.

A. Professional Preparation

June 1953	B.S., College of the City of New York
Feb. 1955	M.S., (Biochemistry), George Washington University
Feb. 1957	Ph.D., George Washington University (Thesis: Studies on 5-Hydroxyindole Metabolism)
1958	Postdoctoral, University of California, Berkeley, California

B. Appointments

1997-present	Director, Center for Molecular Biology and Biotechnology and Distinguished Research Professor, Dept. of Biological Sciences, Florida Atlantic University, Boca Raton, FL
1983-1996	Vice President Hoffmann-La Roche Inc.
1983-1996	Director Roche Institute of Molecular Biology
1969-1983	Associate Director Roche Institute of Molecular Biology
1968-1969	Acting Chief, Laboratory of Clinical Biochemistry, National Institutes of Health, Bethesda, Md.
1953-1968	Chemist, National Heart Institute, Bethesda, MD

C. Selected Recent Peer-Reviewed Publications

Moench, I., Prentice, H., Rickaway, Z., Weissbach, H. Sulindac confers high level ischemic protection to the heart through late preconditioning mechanisms. Proc. Natl. Acad. Sci. USA. (2009) **106 (46)**, 19611-19616.

Brunell, D., Weissbach, H., Hodder P., Brot, N. A High Throughput Screening Compatible Assay for Activators and Inhibitors of Methionine Sulfoxide Reductase A. Assay Drug Dev Technol. (2010) **8 (5)**, 615-620.

Brunell, D., Sagher, D., Kesaraju, S., Brot, N., Weissbach, H. Studies on the metabolism and biological activity of the epimers of sulindac. Drug Metab Dispos. (2011) **39(6),** 1014-1021.

Prentice, H. M. & Weissbach, H. Two novel approaches providing cardiac protection against oxidative stress. In: Novel Stategies in Ischemic Heart Disease. (Ed. Lakshmanadoss, U.), (2012) Pp, 229-246, InTech.

Ayyanathan, K., Kesaraju, S., Dawson-Scully, K., Weissbach, H. (2012) Combination of Sulindac and Dichloroacetate Kills Cancer Cells via Oxidative Damage. PLoS One 7(7): e39949.

Minnerly J, Zhang J, Aldunate R, Weissbach H, Jia K (2013) Methionine Sulfoxide Reductase A Mediates Dietary Restriction-Induced Lifespan Extension in Caenorhabditis elegans. Aging Sci 1: 110.

Sur, A., Kesaraju, S., Prentice, H., Ayyanathan, K., Baronas-Lowell, D., Zhue, D., Hintone, D. R., Blanks, J., and Weissbach, H. Pharmacological protection of retinal pigmented epithelial cells by sulindac involves PPARα. Proc. Natl. Acad. Sci. USA. (2014) (In Press).

D. Selected Other Publications or Products/Grants

Weissbach, H., Brot, N. Catalytic antioxidants and methods of use. Florida Atlantic University October 2006: US Patent 7,129,374.

Weissbach, H., Brot, N. Catalytic antioxidants and methods of use. Florida Atlantic University August 2008: US Patent: 7,414,139.

Weissbach, H., Resnick, L., Binninger, D. Treatment or prevention of cancer and precancerous disorders. Florida Atlantic University September 2012: US Patent: 8,258,181.

Weissbach, H., Resnick, L., Binninger, D. Treatment or prevention of cancer and precancerous disorders. Florida Atlantic University January 2013: US Patent: 8,357,720.

Weissbach, H., Brot, N. Protection of normal cells. CHS Pharma, Inc. July 2013: US Patent: 8,487,128

Weissbach, H., Resnick, L., Binninger, D. Treatment or prevention of cancer and precancerous disorders. CHS Pharma, Inc. December 2013: US Patent: 8,603,985.

Ongoing Research Support

State of Florida - State Appropriation Grant. Weissbach (PI). 07/01/14. **CMBB-Jupiter Instrument Facility**

NIH-1R03DA32473-1. Weissbach (PI). 04/01/11-03/31/14. **Studies on peptide methionine sulfoxide reductases: High Throughput Assay for Activators and inhibitors of MsrA**

FAU Foundation. Weissbach (PI). 01/01/97 to present. **Studies on MsrA and sulindac**

Completed Research Support

FAU- President's Award. Weissbach (PI). 01/01/10-12/31/12. **Elucidate the mechanism by which sulindac selectively enhances the killing of cancer cells under oxidative stress**

NIH-1R15CA122001-01A1. Weissbach (PI). 04/01/07-03/31/10. **Sulindac enhances the killing of cancer cells but protects normal cells under oxidative stress**

SURECAG State Grant. Weissbach (PI). 06/01/08-04/30/10. **Attempts to further the commercialization of sulindac as a therapeutic agent**

Selected Honors and Awards

Member (Governor's appointment) - Biomedical Research Advisory Council (BRAC), State of Florida

Elected Member, National Academy of Sciences

Elected Member, American Academy of Microbiology

Elected Member, National Academy of Inventors

E. Synergistic Activities

Training Programs Developed:

Biotechnology Certificate Program

The Professional Science Masters Degree (PSM) in Biotechnology

University Committees

Member - Institutional Biosafety Committee

Member - Ph.D. Admission Committee, Integrative Biology and IBAN Program

Member – Executive Committee of the Charles E. Schmidt College of Science,

Member – NTE Promotion Committee, Charles E. Schmidt College of Science

F. Collaborators and Other Affiliations

G. Courses Taught

H. Community Engagement or Out-Reach

Recent Invited Lectures

2010 Invited Speaker, 2010 Julius Schultz Visiting Professor Lectures, University of Miami, School of Medicine, Miami, Florida

2011 Invited Speaker @ the 2011 Distinguished Speaker Series, Torrey Pines Institute, Port St Lucie, Florida

2012 Invited Speaker, Lifelong Learning @Florida Atlantic University, Jupiter, FL

2013 Invited Speaker, USDA Port St. Lucie FL

2014 Invited Speaker, 2014 Vaccine & Gene Therapy Institute of Florida, Port St Lucie, Florida

JEANETTE WYNEKEN, Ph.D. ABBREVIATED FACULTY CV

A. Professional Preparation

1988 Ph.D. in Biology, Dept. of Ecology, Ethology and Evolution, Univ. of Illinois
1978 B.A. in Biology (minors: Chemistry, Philosophy), Illinois Wesleyan Univ.

B. Appointments 2000-present

2014(August)-	Professor, Department of Biological Sciences, Florida Atlantic University, Boca Raton, Florida
2006-2014 (through July)	Associate Professor, Department of Biological Sciences, Florida Atlantic University, Boca Raton, Florida
2008-2011	Graduate faculty, Clemson Univ. (Ph.D. committee)
2007-2009	Graduate faculty, Univ. Alabama Birmingham (Ph.D. committee)
2000-2006	Assistant Professor, Department of Biological Sciences, Florida Atlantic University, Boca Raton, Florida
1995-2007	Instructor, Harbor Branch Oceanographic Inst., Fort Pierce, Florida
1995-2009 (summer term)	Adjunct Assist. Professor, Florida Institute of Technology, Melbourne, Florida
1998-2003	Instructor, Graduate faculty, Duke University Marine Laboratory, Beaufort, North Carolina
1996-2000	Research Assistant Professor, Florida Atlantic University, Boca Raton, Florida

C. Selected Peer-Reviewed Publications

Stacy BA, CJ Innis, P-Y Daoust, J Wyneken, M Miller, H Harris, MC James, EF Christiansen, A Foley. Solitary Large Intestinal Diverticulitis in Leatherback Turtles (*Dermochelys coriacea*). Vet Pathol doi: 10.1177/0300985814549211

Mansfield KL, Wyneken J, Porter WP, Luo J. 2014 First satellite tracks of neonate sea turtles redefine the 'lost years' oceanic niche. Proc. R. Soc. B 281: 20133039. http://dx.doi.org/10.1098/rspb.2013.3039

Bovery CM, J Wyneken. 2013. Sea Turtles in Florida's Atlantic Waters. Marine Fisheries Review.75(3):1-12.

Perrault JR, DL Miller, J Garner, J Wyneken. 2013. Mercury and selenium in leatherback sea turtles (*Dermochelys coriacea*): hazard quotients, population comparisons, implications for hatching success and directions for future research. Science of the Total Environment 463–464 (2013):61–71

Mansfield KL, J Wyneken, D Rittschof, M Walsh†, CW Lim†, P Richards, 2012. Satellite tag attachment methods for tracking neonate sea turtles. Marine Ecology Progress Series. 457: 181–192

D. Selected Other Publications or Products/Grants

Conrad, JR, J Wyneken, JA Garner and S. A. Garner. 2011. Experimental assessment of aggressive dune vegetation impact and its control on leatherback sea turtle (*Dermochelys coriacea*) nest success. Endangered Species Research. 15: 13–27.

Rivera ARV, J. Wyneken, R W. Blob. 2011. Forelimb kinematics and motor patterns of swimming loggerhead sea turtles (*Caretta caretta*): are motor patterns conserved in the evolution of new locomotor strategies? Journal of Experimental Biology 214:3314-3323

Wyneken. J. 2013. Contemporary Computed Tomography and Magnetic Resonance Imaging of Reptile Anatomy. Chapter 9. *In*. Current Therapy in Reptile Medicine and Surgery. D.R. Mader and S. Divers, eds. Elsevier Health Sciences. St. Louis. Pp 93-106.

Wyneken J, KJ Lohmann & J Musick eds. 2013. *The Biology of Sea Turtles* Volume III. CRC Press/Taylor and Frances Group. Boca Raton, 457 pp.

Wyneken, J., M. Godfrey, & V. Bels, eds. 2008. *The Biology of Turtles*. CRC Press/Taylor and Frances Group. 389 pp.

Grants and contracts: I received more than $350,000 in external funding 2007-2014

E. Synergistic Activities

I have more than a decade of experience as advisor to graduate students (Masters and doctoral advisor) in Biological Sciences, and have served on graduate committees of students in Biological sciences, Integrative Biology, and Environmental Sciences at FAU; I served on a number of thesis and dissertation committees at other major US and foreign institutions, occasionally as co-advisor. I have more than 25 years of experience studying the morphology, ecology, behavior, and physiology of reptiles and particularly, marine turtles. These studies resulted in a number of very successful collaborations.

I integrate my research into my classes including Biology of Sea Turtles, Comparative Vertebrate Morphogenesis, Research in Marine Biology seminar and Marine Conservation Biology.

F. Collaborators and Other Affiliations

I have collaborated with 72 different professionals on peer-reviewed publications since coming to FAU, 53 in the past 5 years.

Ph.D. External Committee Memberships:
Anthony Rafferty (Monash University, Australia) external reviewer of Ph.D. 2012
Carla M. L. Pereira (Univ. of Queensland, Australia) external reviewer of Ph.D. 2013
Angela Rivera (Clemson University) 2011
Anne Marie LaBlanc (University of Alabama-Birmingham) 2009

G. Courses Taught 2009-2014

Comparative Vertebrate Morphogenesis, Lecture Zoo4690
Adv. Comparative Vertebrate Morphogenesis Lecture (new course) Bsc6936-003
Comparative Vertebrate Morphogenesis Lab Zoo4690L
Adv. Comparative Vertebrate Morphogenesis Lab (new course) Bsc6936-004
Directed Independent Study - Sea Turtle Research –BSC4905
Directed Independent Study – Reptile Anatomy –BSC4905
Marine Conservation Biology (new course) Bsc6936-013, -014, -015
Environmental Sex Determination (new course) BSC 6936
Ecological Development (new course) BSC 6936-005
Research Seminar in Marine Science BSC6905-032, -033 -034
Environmental Change/Marine Organisms & Ecosystems in Changing Climates (co-taught with M. Koch) (new course) BSC6936-016/ BSC6905-016

H. Community Engagement or Out-Reach

Each year I give 4-8 general and professional lectures in reptile anatomy and physiology, sea turtle biology, oceans and climate, marine animal dispersal, and conservation. In the past 5 years provided my expertise as science advisor National Geographic Magazine's feature on leatherback turtles, (TV4, UK) *Inside Nature's Giants* (python anatomy, and sea turtle anatomy). Locally I have given three lectures for the Loggerhead Marinelife Center's volunteers, 3 lectures to Gumbo Limbo Nature Center, three lectures to local Rotary Clubs and three general talks to lectures to Harbor Branch Oceanographic Institution.

ABBREVIATED FACULTY CV

Xing-Hai Zhang

A. PROFESSIONAL PREPARATION

University of Calgary, Canada	Plant Molecular biology	Ph.D.	1994
Michigan Technological University, USA	Plant Molecular biology	Post-doctoral	1994-1996

B. APPOINTMENTS

2009-present Associate professor, Department of Biological Sciences, Florida Atlantic University, FL.
2003-2009 Assistant professor, Department of Biological Sciences, Florida Atlantic University, FL.
1997-2003 Research associate, USDA, Photosynthesis Unit/University of Illinois, Department of Crop Sciences, Urbana, IL.

C. SELECTED PEER-REVIEWED PUBLICATIONS

Zhang X.-H., Keating P., Wang X.-W., Huang Y.-H., Martin J., Hartmann J.X. and Liu A. (2014) Production of functional native human interleukin-2 in tobacco chloroplasts. **Molecular Biotechnology**, 56: 369–379.

Barone P., **Zhang X.-H.** and Widholm J.M. (2014) Tryptophan and Indole Analog Mediated Plastid Transformation. In *Chloroplast Biotechnology: Methods and Protocols* (Maliga P., ed). Methods in Molecular Biology, vol. 1132, Springer Science+Business Media New York, pp 187–203.

Webb J. and **Zhang X.-H**. (2013) Organ disparate allocation of plasticity in phosphorus response as an underlying mechanism for the sawgrass-to-cattail habitat shift in Florida Everglades wetlands. **International Journal of Plant Sciences**, 174: 779–790.

Koch M., Bowes G., Ross C. and **Zhang X.-H.** (2013) Climate change and ocean acidification effects on seagrasses and marine macroalgae. **Global Change Biology**, 19: 103–132.

Li Q., Lin Y.-C., Sun Y.-H., Song J., Chen H., **Zhang X.-H.**, Sederoff R.R. and Chiang V.L. (2012) Splice variant of the SND1 transcription factor is a dominant negative of SND1 members and their regulation in *Populus trichocarpa*. **Proceedings of the National Academy of Sciences, USA**. 109: 14699–14704.

Shi R., Sun Y.-H., **Zhang X.-H**. and Chiang V.L. (2012) Poly(T) adaptor RT-PCR. In *Next-Generation MicroRNA Expression Profiling Technology: Methods and Protocols* (Fan J.-B., ed). Methods in Molecular Biology, vol. 822, Humana Press, New York, pp 53–66.

D. SELECTED OTHER PUBLICATIONS OR PRODUCTS/GRANTS

*Sun Y.-H., *Shi R., ***Zhang X.-H.**, Chiang V.L. and Sederoff R. (2012) MicroRNAs in trees. **Plant Molecular Biology**, 80: 37–53. (*equal contribution)

Lin L., Webb J. and **Zhang X.-H.** (2011) Involvement of arbuscular mycorrhizal symbiosis in the distribution of sawgrass and cattail in Florida Everglades. **Wetlands**, 31: 263–272.

Zhang X.-H., Webb J., Huang Y.-H., Lin L., Tang R.-S. and Liu A. (2011) Hybrid Rubisco of tomato large subunits and tobacco small subunits is functional in tobacco plants. **Plant Science**, 180: 480–488.

Tsai F.-Y., **Zhang X.-H**., Ulanov A. and Widholm J.M. (2010) The application of the yeast N-acetyltransferase *MPR*1 gene and the proline analog L-1 azetidine-2-carboxylic acid as a selectable marker system for plant transformation. **Journal of Experimental Botany**, 61: 2561–2573.

Patent Widholm J.M., Barone P. and **Zhang X.-H.** (December 7, 2010) Use of Tryptophan Indole and Anthranilate Analogs as Plant Transformation Selection Agents, US Patent number 7,847,152 B2.

Grant PI: Koch M., Co-PIs: **Zhang X.-H.** and Bowes G., Ocean acidification, temperature and light effects on carbon-use mechanisms, calcification, and growth of tropical macroalgae: Drivers of winners and losers., National Science Foundation, $422,788; 2014-2017.

E. SYNERGISTIC ACTIVITIES

2007-present	Mentor, NSF Undergraduate Research and Mentoring program at FAU.
2009	Judge, Science Olympiad (cell biology), regional, South Florida.
2007	Mentor, High School eCybermission Internship (US Army).

F. COLLABORATORS AND OTHER AFFILIATIONS

George Bowes, University of Florida, Gainesville, FL.
Vincent L. Chiang, North Carolina State University, Raleigh, NC.
C.C. Chinnappa, University of Calgary, Calgary, Canada.
Nwadiuto Esiobu, Florida Atlantic University, Davie, FL.
Marguerite Koch, Florida Atlantic University, Boca Raton, FL.
Shili Miao, South Florida Water Management District, West Palm Beach, FL.
Archie R. Portis, USDA, Urbana.
Cliff Ross, University of North Florida, Jacksonville, FL.
Ronald Sederoff, North Carolina State University, Raleigh, NC.
Herbert Weissbach, Florida Atlantic University, Jupiter, FL.
Jack Widholm, University of Illinois, Urbana, IL.

G. COURSES TAUGHT

Genetics (PCB 3603), 2014

Principle of Plant Physiology (BOT 4503/BSC 6936), 2004-2014

Plant Physiology Laboratory (BOT 4503L/BSC 6936), 2004-2014

Plant Biotechnology (BOT 4734C/BSC 6936), 2005, 2007, 2009, 2011-2014

H. COMMUNITY ENGAGEMENT OR OUT-REACH

2012-present Adviser, Biotechnology program, Spanish River High School, Boca Raton, FL.

Reviewer for “Plant Molecular Biology Reporter”, “Applied Biochemistry and Biotechnology”, “Molecular Biotechnology”, “Plant Growth Regulation”, “Archives of Biochemistry and Biophysics”, “International Journal of Plant Sciences”, “Biological Invasions” and other journals.