Distinction through Discovery Undergraduate Research Grants Program

**Purpose:** To encourage undergraduate students from all disciplines to participate in independent research and creative projects in collaboration with FAU faculty. The research or creative activity conducted by the student generally takes diverse forms of directed research, such as independent study, work on an honors thesis or part of a larger ongoing study under the direct supervision of a faculty member, rather than work conducted to fulfill regular course or seminar requirements.

**Student and Faculty Eligibility:**
- Any full-time, continuing, undergraduate student in good standing (academic and disciplinary) at Florida Atlantic University
- Students may receive only one Undergraduate Research Grant every twelve months.
- Faculty mentors may receive no more than two grants per grant cycle for students they mentor. (Additional grants may be awarded if funds are available.)

**Deadlines:** Grant package deadlines are due by October 15th for Fall/Spring funding, and **NEW for 2016, April 15th** for Summer/Fall funding. Should these dates fall on a weekend day or holiday, the deadline will become the next business day.

**Grants:** Grant allocations are categorized based on the following
1. Individual students engaged in research or creative activity under the mentorship of a FAU faculty member may apply for a grant of up to $500 to support their work.
2. Group projects, consisting of two or more students working on the same or similar projects under the mentorship of a FAU faculty mentor may apply for a grant of up to $1,000.

Applicants will be asked to identify the maturity of project (Exploratory, Developing or Advanced) to facilitate the review process. Please see Appendix A for definitions.

**Grant Expenditures:** Grant funds must be applied to tangible research expenditures. Applicants should discuss research needs with their faculty mentor before submission of their proposed budget. Any purchases, such as equipment and remaining supplies, must remain at FAU after the project is completed as property of the mentor’s department. Please see Budget section for more details.

**Grant Period:** Funds associated with the Undergraduate Research Grant must be spent within one year from the date the grant is awarded. The project can continue past this date.

**Judging criteria:** All grants will be judged by a panel of faculty, staff and students who will evaluate the merit of the proposal based on an evaluation rubric (see also Appendix E):

a) **Strength of Proposal** - Proposals must be clear, concise, and understandable for reviewers from varying disciplines (broad backgrounds). Strong proposals should also meet the following criteria:
   - Clear focus on research question or scholarly problem addressed in this study: The grant explicitly states what the project will accomplish. There is a clear central idea, hypothesis, or objective.
   - If a group project is selected, each group member must have a clear role/task supporting the overall research question(s).
   - Background theory: provides an evaluation of previous work conducted in the area related to the question or the problem.
• Sound methodology: Methodology clearly conveys the steps that will achieve the purpose of this project and how data/information will be obtained.

• Contribution to the field or discussion of potential impact: There is an explanation of
  o the importance of the proposed project, “in the big scheme of things”
  o the value of the project’s impact
  o The project’s contribution of an original, intellectual, or creative work to the discipline

b) Timeline/Plan of Work- The student outlines the time necessary to complete the project successfully. It is justified that the project can be reasonably completed in that time (including allocating time for research compliance requirements), and that the student will present at a FAU Research Symposium.

c) Appropriateness of Budget - The requested budget is justified and necessary for the completion of the project. The budget provides detail associated with what will be purchased (item and quantity) and an explanation of the needs evidenced by the methodology section, as well as detail on where and how the funds will be spent (see Appendix C for samples).

d) Faculty Mentor’s Letter- The mentor endorses the project and the merit of the student conducting the project, and assures the reviewers that no other funds exist for parts/all of the project. The mentor provides appropriate research compliance information as it applies to this project (see Appendix D for more information).

Research Compliance/EHS: Please refer to Appendix B for more information. Please keep in mind that IRB/IACUC protocol and IBC approval may take 6 – 8 weeks and must be submitted by your Faculty Mentor. EH&S trainings and certifications are offered once per month. Please register for required training as soon as possible. If you are unsure which trainings you need, check with your Faculty Mentor.

We highly recommend students conducting any research or scholarly activities participate in the CITI (Collaborative Inter-Institutional Training Initiative). This provides access to courses that are designed to be used by institutions and organizations to provide comprehensive training in a variety of areas.

Award Notification: Within one month to six weeks of the closing date of the Undergraduate Research Grant package guidelines, grant awardees will be notified by an email sent to both the student and faculty mentor. Grant funds will be released to the department of the FAU faculty member for disbursement once all research compliance issues have been resolved. It is expected that compliance issues be addressed in a timely manner (within 2 months of the award notification).

Grant Recipient Requirements: Individuals awarded grants must:
1. Be able to complete the project as an enrolled undergraduate at FAU.
2. Present this work at the annual Undergraduate Research Symposium, in April each year.
3. Participate in pre- and post-grant award surveys regarding experience of research project.
4. Reference the grant in future presentations and/or publications resulting from this work.
APPENDIX A: Grant Maturity

**Exploratory** - Beginning or Exploring a new research idea, NOT expanding an ongoing project in a new direction (see below for that)

**Developing** - Further developing or Expanding the scope of a project, where the project has likely been ongoing for less than one calendar year (at the time of submission of this grant package)

**Advanced** - Research projects that have likely been ongoing for more than one year (at the time of submission of this grant package)
APPENDIX B: Research Compliance Information

About IACUC

Florida Atlantic University’s Institutional Animal Care and Use Committee (IACUC) has been established in accordance with the Animal Welfare Act and Public Health Service Policy on the Humane Care and Use of Animals. The committee is composed of individuals dedicated to the humane care of animals used in research and teaching, and provides oversight and assistance in ensuring compliance to all laws, regulations, and policies governing the care and use of research and teaching animals. FAU’s IACUC is composed of scientists, non-scientists, veterinarians and community members who are appointed by the Vice President for Research, the Institutional Official responsible for the animal care and use program. FAU’s animal care and use program is regulated by both the U.S. Department of Agriculture and the U.S. Public Health Service. University faculty, staff, and students using animals in research, teaching or display must have IACUC approval to do so.

About IRB

Florida Atlantic University’s Institutional Review Board (IRB) is a federally mandated committee that oversees the ethical conduct of human subjects research at an institution. Florida Atlantic University’s IRB serves an important role in the protection of the rights and welfare of human subjects involved in research. The IRB reviews and approves protocols for research involving humans and ensures that appropriate steps are taken to protect their rights and welfare. FAU’s IRB is comprised of faculty members representing a variety of backgrounds, training and experience, as well as community members who are appointed by the Vice President for Research, the Institutional Official.

If your research meets the following two definitions then you are involved in research with human subjects: "Research" means a systematic investigation designed to develop or contribute to generalizable knowledge. "Human subject" means a living individual about whom an investigator conducting research obtains: 1.) data through intervention or interaction with the individual, or 2.) identifiable private information.

<table>
<thead>
<tr>
<th>Institutional Animal Care and Use Committee (IACUC)</th>
<th>Institutional Review Board (IRB)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Include but are not limited to:</strong></td>
<td><strong>Subjects that do not need IACUC</strong></td>
</tr>
<tr>
<td>Rodents (mice, rats)</td>
<td>approval include but are not limited to:</td>
</tr>
<tr>
<td>Marine Mammals</td>
<td>Amoebas</td>
</tr>
<tr>
<td>Sharks</td>
<td>Clams</td>
</tr>
<tr>
<td>Fish</td>
<td>Drosophila melanogaster (fruit fly)</td>
</tr>
<tr>
<td>Birds</td>
<td>In vitro cell preparations</td>
</tr>
<tr>
<td>Non-human primates</td>
<td>using established cell lines</td>
</tr>
<tr>
<td>Turtles and Tortoises</td>
<td>Insects, worms, jellyfish, starfish</td>
</tr>
<tr>
<td>Rabbits</td>
<td></td>
</tr>
<tr>
<td><strong>Subjects that do not need IACUC approval include but are not limited to:</strong></td>
<td></td>
</tr>
<tr>
<td>Amoebas</td>
<td>Interviews</td>
</tr>
<tr>
<td>Clams</td>
<td>Surveys</td>
</tr>
<tr>
<td>Drosophila melanogaster (fruit fly)</td>
<td>Focus groups</td>
</tr>
<tr>
<td>In vitro cell preparations using established cell lines</td>
<td>Medical chart reviews</td>
</tr>
<tr>
<td>Insects, worms, jellyfish, starfish</td>
<td>Participant observation studies</td>
</tr>
<tr>
<td></td>
<td>Data and tissue banks</td>
</tr>
<tr>
<td></td>
<td>Clinical or exercise studies</td>
</tr>
</tbody>
</table>

Human subjects research can take many forms. Some examples include:

For more information visit FAU’s Research Integrity website at the following link: [http://www.fau.edu/research/researchint/](http://www.fau.edu/research/researchint/)
About EHS

The goal of Florida Atlantic University’s Environmental Health and Safety is to provide and ensure a safe and healthy environment for students, faculty, staff and visitors through comprehensive service oriented programs. EH&S is also the primary contact for federal, state, and local regulatory agencies regarding matters of health, safety and the environment.

With regard to Undergraduate Research, undergraduate compliance checks will be limited to training requirements, and any occupational health program requirements, i.e. bloodborne pathogens (HBV vaccination), respiratory protection (doctor’s clearance), etc. related to the research to be completed. Additionally, during compliance checks of research laboratories EH&S will ask for a list of all personnel in the lab so that training status can be verified.

Many safety training courses are available through EH&S to assist in developing safety skills that will help when conducting research when using animals, chemicals, biological materials and much more. For most training classes, EH&S requires that initial training be done in-person in the classroom; thereafter, most refresher training can be accomplished online. Unless it is an extreme hardship, online training will not be allowed prior to classroom training; however, approval of the project can be granted upon the individual registering for the next available required classroom training(s). The descriptions of the training programs are available on the website.

Questions to ask about your research project to determine if you may need EH&S review/certification/trainings:

1. Does your research involve Biological Materials/Toxins, Human Blood, Select Agents or Recombinant DNA?
2. Does your research involve radioactive materials, X-rays or lasers?
3. Does the project involve Diving, Snorkeling or the use of Boats?
4. Does the project involve the use of Hazardous Chemicals or Nanomaterials?
5. Does the project involve the production of flame, smoke or heat or any combination of the three?
6. Does the project involve field work (contact dward@fau.edu)?
7. Does the project involve the use of chartered Helicopters or Airplanes (contact dward@fau.edu)?

About IBC

The Institutional Biosafety Committee (IBC) has been delegated the authority to set University policy with regard to biological and recombinant DNA safety. The IBC must comply with the National Institutes of Health (NIH) Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules. The IBC is responsible for overseeing the use of all biological agents and recombinant DNA methods employed in research and teaching projects on Florida Atlantic University's campuses. If your research involves the use of Recombinant DNA, Biological Agents, or Select Agents, please contact Darlene Ward at dward@fau.edu for further assistance. About IBC
APPENDIX C: Sample Budgets and Justifications

Budget Sample 1:

Sample Line-Item Budget

<table>
<thead>
<tr>
<th>Item description</th>
<th>Supplier</th>
<th>Price</th>
<th>Quantity Needed</th>
<th>Total List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-coated PAMPA Plate System</td>
<td>BD Biosciences</td>
<td>$390.11/ 5 pack</td>
<td>1</td>
<td>$390.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(96 wells/pack)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propranolol hydrochloride ≥99% (TLC), powder</td>
<td>Sigma-Aldrich</td>
<td>$31.10/1 gram</td>
<td>1 gram</td>
<td>$31.10</td>
</tr>
<tr>
<td>Lucifer Yellow CH dilithium salt</td>
<td>Sigma-Aldrich</td>
<td>$132.00/25mg</td>
<td>25 mg</td>
<td>$132.00</td>
</tr>
<tr>
<td>TOTAL COST</td>
<td></td>
<td></td>
<td></td>
<td>$553.21</td>
</tr>
</tbody>
</table>

Budget justification:

1. PAMPA Plate System: My research pertains to the findings of peptides that permeate through a cell membrane. Therefore, I require a parallel artificial membrane permeability assay “PAMPA”, to test the penetrating capabilities of the peptides separated by high performance liquid chromatography “HPLC”. After I separated the conotoxins, we established approximately 2000 samples. Approximately half of these samples registered were hydrophobic. These hydrophobic peptides are what I am interested in testing through Pampa. I have identified approximately 900 peptides as being hydrophobic, and I already have one PAMPA package which contains 5 plates that have 96 wells per plate. This gives me 460 wells that I can place samples into for testing. But this would only be enough to test half of my hydrophobic samples. It is imperative that I have another PAMPA package so I can test all of the samples identified as hydrophobic. I need so many wells because every sample has to be separated and tested individually in order to specifically see which sample has the potential to penetrate a cell membrane.

2. Lucifer Yellow: I need the chemical compound Lucifer yellow to act as one of my controls. This compound is used specifically as a non-permeable control group.

3. Propranolol hydrochloride: Contrary to the Lucifer Yellow I have Propranolol Hydrochloride as our other control due to its ability to penetrate cell membranes because of its lipophilic characteristics. These two controls are needed so I know that the pampa's artificial membrane is working properly and allowing only compounds that are permeable to pass through the membrane and inhibiting all non-permeable compounds from passing through the membrane.

Overage:

Since the total request goes over the allocated $500 budget, my research advisor has committed to providing the additional $53.21 in materials as evidenced by his letter of recommendation.
### Budget Sample 2:

<table>
<thead>
<tr>
<th>Items description</th>
<th>Supplier</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS-Garmin ETrex 20</td>
<td>Forestry Suppliers</td>
<td>1</td>
<td>199.95</td>
</tr>
<tr>
<td>Suunto KB-14 Azimuth Compass Zone 1</td>
<td>Forestry Suppliers</td>
<td>1</td>
<td>99.95</td>
</tr>
<tr>
<td>Millimeter graph paper</td>
<td>Forestry Suppliers</td>
<td>1 pack</td>
<td>15.00</td>
</tr>
<tr>
<td>ArcGIS annual license</td>
<td>ESRI</td>
<td>1</td>
<td>100.00</td>
</tr>
<tr>
<td>Field notebook</td>
<td>Forestry Suppliers</td>
<td>1</td>
<td>15.00</td>
</tr>
</tbody>
</table>

**Total amount requested:** 429.90

### Budget Justification

1. GPS-Garmin ETrex 20: The GPS Garmin ETrex will be purchased and used for collecting spatial data for mapping research sites.
2. Suunto KB-14 Azimuth Compass Zone 1. Since much of the research will involve navigating through research sites and will be used for orienteering & walking survey transects.
3. Millimeter graph paper: will be purchased for data collection and for drawing maps.
4. ArcGIS annual license: This individual student license will be purchased as software used in the discipline for making project maps.
5. Field notebook: I will purchase a field notebook for data collection on-site of field notes.

### Generic Budget Sample 3: for travel to research site.

<table>
<thead>
<tr>
<th>Items Needed</th>
<th>Vendor</th>
<th>Quantity</th>
<th>Price</th>
<th>Budget Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round trip airfare to _______</td>
<td>FAU Travel service</td>
<td>1</td>
<td>215.00</td>
<td>Travel to research archive</td>
</tr>
<tr>
<td>Hotel</td>
<td>Days Inn</td>
<td>1</td>
<td>160.00</td>
<td>Lodging (4 nights) while working at archive</td>
</tr>
<tr>
<td>Photocopying</td>
<td>Archive</td>
<td>100</td>
<td>10.00</td>
<td>Copies of critical documents</td>
</tr>
</tbody>
</table>

**Total amount requested:** 385.00
APPENDIX D: Faculty Mentor’s Letter of Recommendation Requirements

Dear Faculty,

Your undergraduate student is applying for an Undergraduate Research Grant program to support their project. We need your assistance in writing a letter of recommendation so that the selection committee is better able to judge the grant package guidelines received. Please ensure that your letter addresses the following:

1. The importance of the research and how it contributes to the student’s development and to the discipline or practice
2. The feasibility of the proposed project and timeline presented (evaluation of the project)
3. The maturity of the research project (Exploratory, Developing, or Advanced – Appendix A)
4. The capability of the student in pursuing and completing the research in the time-frame identified (evaluation of the student)
5. Your willingness to provide oversight of the project including meeting with the student regularly during the course of the research project and reviewing their work in preparation for presentation at the Annual Undergraduate Research Symposium
6. The justification of funding as it applies to its impact on this specific project and assurance that no other funding is available or an explanation of current funding for the project. For example, how will the grant support parts/all of the project not covered by any grants available to the faculty mentor?

7. **Requirement – Certification of Research Compliance** is required if the intended research includes methodology involving an area regulated by Federal, State or University laws and policy (including the use of human or animal subjects, diving and boating safety, work carried out in a wet-lab involving the use of chemicals and/or potential blood-borne pathogens).

**Note:** If this project includes methodology involving an area of compliance listed above, the faculty member must certify in the letter that:

a. Their area(s) of content expertise related to this undergraduate student research project or identify and include a third party faculty to provide the expertise necessary to mentor this student. Please include the name and email address of this faculty expert in your letter;

b. The student(s) is included in all appropriate compliance protocols and provide protocol number in your letter; and

c. The student(s) has been properly certified through appropriate EHS training and provide certificates, if applicable.

Once you have completed your letter, please provide it to your student to include in the pdf package or send it directly to ouri@fau.edu by October 15th for Fall/Spring proposals. Should these dates fall on a weekend day or holiday, the deadline will become the next business day.

Thanks so much for your mentorship of this student and your efforts towards growing a culture of undergraduate research and inquiry at FAU.