

Patented Sponge Product Curbs Cancer Cell Division



Aphrocallistes beatrix

Although researchers from the Harbor Branch Marine Biomedical and Biotechnology Research Program (MBBR) routinely undertake expeditions that carry them far

from their Fort Pierce base of operations, one exciting discovery proves you don't have to stray far from home to find something interesting. *(story continues on next page)*



PATENTED SPONGE PRODUCT CURBS CANCER CELL DIVISION, CONT'D.

well as the cells of a breast cancer cell line with proven resistance to current chemotherapies. Colon cancer and pancreatic cancer combined kill more than 80,000 Americans every year, and novel treatments to combat these diseases are urgently needed.

The potential of aphrocallistin as a future anti-cancer agent prompted collaborators at Orlando's Sanford Burnham Institute for Medical Research to pursue laboratory synthesis of several analogs. Evaluation of the cancer-fighting potential of these analogs was headed up by another member of the MBBR team, Assistant Research Professor Esther Guzmán, Ph.D. The results of this work suggest some of the synthetic forms of the drug may be more than 20 times more effective than the original sponge-derived product in inhibiting cancer cell proliferation.

The need for more of the natural sponge product to study alongside the synthetic analogs required additional collection of the source sponge. A 2009 follow-up collection, also made using the *JSL II*, occurred during a NOAA-funded deep-coral assessment expedition that took place off of southeast Florida. Research Professor John Reed served as Co-Principal Investigator during the expedition.

This past November, the team was awarded a patent for the marine natural product aphrocallistin—a chemical that is showing promise as a potential anti-cancer therapeutic agent. The compound was isolated from a sponge identified as *Aphrocallistes beatrix* collected a mere 35 miles off of Fort Pierce. The specimen—belonging to a class of sponges called glass sponges because their skeletons are composed of glass-like skeletal elements—was taken at a depth of more than 725 m (2,380 ft) using the *Johnson-Sea-Link II* manned research submersible. The collection site was located atop mounds of the deep-water coral species *Lophelia pertusa*.

The discovery of the active marine product aphrocallistin is credited to MBBR Director and Research Professor Amy Wright, Ph.D., shown above, and her MBBR colleagues. Dr. Wright has been a key part of the Harbor Branch marine drug discovery program since its inception, beginning her career here as a postdoctoral fellow in 1985.

Laboratory assays indicate that aphrocallistin inhibits the proliferation of pancreatic and colon cancer cells as

The inventors for US Patent Number 8,058,430 "Biologically Active Aphrocallistin Compounds" are: Amy E. Wright, Susan H. Sennett, Shirley A. Pomponi, Peter J. McCarthy, Esther A. Guzmán

Dr. Esther Guzmán

FAU Researcher of the Year



Assistant Research Professor Esther Guzmán, Ph.D., of the Marine Biomedical and Biotechnology Research Program (MBBR) has been building a reputation as a leader in the field of cancer cell biology since arriving at Harbor Branch as a postdoctoral investigator in 2005, and this success is now being appreciated by others outside of the field. Last month, Florida Atlantic University named her its 2012 Researcher of the Year at the assistant professor level.

Dr. Guzmán is being recognized for her efforts to find marine natural products that aid the treatment, prevention and understanding of pancreatic cancer, the fourth leading cause of cancer deaths in the U.S., with particular focus on the connection between pancreatic inflammation and cancer onset. Her work has attracted nearly \$2.5 million in research funding over the past five years, including a number of highly competitive National Institutes of Health grants. She also has produced 11 frequently cited peer-reviewed publications and is an inventor on patents both issued (see previous page) and under review.

Dr. Guzmán is the second FAU Researcher of the Year from Harbor Branch, joining her MBBR colleague Research Professor Amy Wright, Ph.D., who was honored in 2009.

Executive Director's Report



In February, the first of what will be an annual Indian River Lagoon scientific meeting was held at Harbor Branch. This year's event, the IRL Symposium, featured more than 70 scientific presentations from well over a dozen research and resource management organizations with an interest in the IRL, and about 200 other participants. It was a proud day for all of us at Harbor Branch, and a natural next step in the evolution of our work on the Indian River Lagoon.

We've been working in the IRL since Harbor Branch was founded, and it was the focus of one of our first collaborative research efforts, the Indian River Lagoon Coastal Zone Study, in 1973. Two of our partners in that effort, the Smithsonian Marine Station and Florida Institute of Technology, were members of this year's IRL Symposium steering committee. In addition to studies of the water quality, seagrasses and mangroves, and organisms from bacteria to bottlenose dolphins, we're moving toward development of a sensing network to enhance our ability to observe and understand IRL processes.

As part of a state university, we have a responsibility to operate in the public interest beyond our role as a steward of marine resources. We honor both of these commitments by convening those who study the IRL to facilitate knowledge exchange and collaborative engagement. We can do so much more together than we can alone.

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Brilliant Dive Service Commitment Complete



On January 1, 2012, John Reed completed 24 years of service as Harbor Branch Dive Safety Officer (DSO) and chairman of the Diving Control Board. He also served as diving supervisor for the Harbor Branch Division of Marine Science and other areas since 1976. Understanding the significance of this milestone requires knowing a little more about the positions and Reed's dedication.

Scuba diving is essential to marine science, and while commercial diving is governed by Occupational Safety and Health Administration regulations, scientific diving adheres to policies and procedures established by the American Academy of Underwater Sciences (AAUS). According to this governance, research organizations must have a Diving Control Board that meets regularly to provide program oversight, a DSO who manages day-to-day operations and a peer-reviewed Dive Safety manual. Reed has served on numerous AAUS committees and its Board of Directors since 1988. He has been nominated several times for the acclaimed Conrad Limbaugh Award, and in 2011 for the NOGI (New Orleans Grand Isle) award, which has been called diving's oldest and most prestigious recognition.

As DSO, Reed has been responsible for reviewing and approving dive plans that must accompany every research dive, detailing dive location(s), activities and contingencies such the nearest provider of emergency medical care. He has trained more than 70 Harbor Branch scientific divers, supplementing their general certifications with the skills, techniques, safety and

rescue protocols that ensure safe and productive expeditions. Reed was responsible for the training and certifications for cardiopulmonary resuscitation, emergency oxygen administration, automated external defibrillator operation and first aid. The outstanding safety record of the Harbor Branch dive program is a testament to his efforts.

Reed's teaching flows from a wealth of experience. He has conducted more than 2,000 scientific scuba dives, as well as 35 deep-water lockout dives from the *Johnson-Sea-Link* submersibles to depths of 300 feet using a helium-oxygen gas mixture. These efforts hint at the prolific nature of his research and conservation career, the accomplishments of which make his commitment to the dive program and other Harbor Branch service activities all the more astounding. In terms of impact on Harbor Branch, John Reed has few peers.

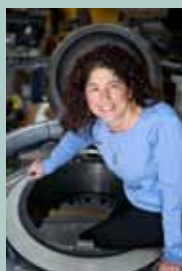


John Reed holds samples collected using the Johnson-Sea-Link submersible



"We all owe John a debt of gratitude for making our diving program one of the best and safest in the country."

- Dennis Hanisak, Ph.D.



"The Harbor Branch diving program owes its impressive safety record to John's leadership and supervision."

- Shirley Pomponi, Ph.D.



"I could not ask to dive with a better lead diver or dive buddy than John Reed: He is the very best."

- Amy Wright, Ph.D.



MARINE & OCEANOGRAPHIC ACADEMY WINS NATIONAL OCEAN SCIENCE FLORIDA MANATEE BOWL

The B Team from Fort Pierce's Westwood High School's Marine & Oceanographic Academy (MOA) was crowned regional champion of the National Ocean Sciences Bowl (www.nosb.org) on March 3rd. A high school competition testing the knowledge of a wide range of ocean-related topics, the "Florida Manatee Bowl" attracted 16 teams from Jacksonville to Miami to Harbor Branch. By the slimmest of margins, the MOA B Team defeated the MOA A Team, which had won the 2011 regional competition, in the final round, and will advance with 24 other regional champions to the 15th Annual National Ocean Sciences Bowl, April 19-22 in Baltimore, Maryland.

The other top teams were Pinecrest's Miami Palmetto High School (third place), and Miami's MAST Academy's Team A (fourth place).

NOSB seeks to interest students in the ocean sciences as a college major and potential career. Since its inception 15 years ago, the NOSB Florida Manatee Bowl has been co-hosted by Harbor Branch and the University of Miami's Rosenstiel School of Marine and Atmospheric Science, with the event alternating each year between Fort Pierce and Miami. Moderators and judges for the event are drawn from both institutions.

Dennis Hanisak, Ph.D., Harbor Branch's director of education and coordinator of this event, calls the Florida Manatee Bowl "an opportunity for Florida's high school students to showcase their interest and understanding of one of our greatest resources, our oceans."

MOA B Team (L-R): Jeremy Johnson, Brooke Gaylord, Danielle Gordan, Samantha Oxley, Coach Scott Hurley and Shelby Busenbark.



Renowned environmentalist Nathaniel Reed and HBOI Foundation Chairman and President Joe Duke at the Foundation's Love Your Lagoon event

Foundation News



BOARD ELECTS NEW MEMBER, OFFICERS

The annual meeting of the Harbor Branch Oceanographic Institute Foundation Board in January was marked by transition, including the election of new member Michael W. Toner (*shown left*) and the retirement

of Jim Seitz as Board Chairman and President. Toner is a retired Executive Vice President of General Dynamics. He was responsible for the Marine systems group, which includes Bath Iron Works, Electric Boat, NASSCO and AMSEA, from 2003 until his retirement in December 2008. He had been a vice president of General Dynamics since January 2000 and president of Electric Boat from January 2000 to October 2003. He spent his entire career (43+ years) in shipbuilding. Toner has been involved in all production, planning and support activities from the start of a Trident submarine's construction to its delivery. Toner earned a bachelor's degree in nuclear science from the New York Maritime College and a master's degree in engineering from the University of Connecticut in 1970, and an executive-level MBA from the University of New Haven in 1982.

As Chairman and President from 2009-2012, Seitz played a key leadership role as Harbor Branch became integrated with Florida Atlantic University, and was instrumental in the negotiations that delivered Harbor Branch property along the Indian River Lagoon from the threat of development to preservation by the State of Florida. He is succeeded by Joe Duke.

Incoming Chairman and President Joe Duke was elected to the board in 2008. Duke, an industrial designer, entrepreneur and director of The Everglades Foundation, also served as a trustee for Woods Hole Oceanographic Institution for many years. Duke has been involved with Harbor Branch for nearly 30 years.

Also at the annual meeting, Michael Minton was elected Vice Chairman, John McConnell was re-elected Treasurer and Bill Stewart was re-elected Secretary. Other board members include C. Amos Bussmann, Richard Carnell, Dr. Margaret Leinen (ex officio), Marilyn C. Link (emerita), Sherry Plymale, Dean Saunders, Dr. Charles Finkl, Karl M. Steene and Toner.

Friends of Harbor Branch

FRIENDS WELCOMES CINDY WILLSON

Cindy Willson recently was named the new Membership and Special Events Coordinator for Friends of Harbor Branch (FoHB). Originally from Seattle, she most recently was Executive Director of the Frontera Audubon Society in Texas' Rio Grande Valley. In addition to marketing nonprofits, Willson's experience includes fundraising, public relations and program planning. She also has been director of a performing arts theater, has owned and restored a historic inn and is a landscape designer, master gardener and master naturalist.

Besides managing the day-to-day operation of the FoHB membership office, Willson is dedicated to growing membership and to enhancing the membership experience. FoHB is a premier group of annual donors who make a difference in the global research conducted by Harbor Branch researchers. Members learn about ocean science and technology firsthand through events and "behind the scenes" tours that provide special access to Harbor Branch and its faculty.

To support Harbor Branch's commitment to increased community engagement, Willson is developing additional tours, events and interactive experiences, such as the April 13 evening with science editor of *The Washington Post* and author Marc Kaufman, who will give a presentation entitled, "Is There Life Beyond Earth?"

To enrich the value of FoHB membership, she has arranged special events and benefits such as a reciprocity agreement with the Association of Science-Technology Centers that will allow Friends free general admission at more than 250 research organizations and museums around the world beginning May 2012.

Additional membership benefits include:

- advance invitations to presentations such as the *Ocean Science Lecture Series* and other trips, tours and lectures
- an exclusive morning coffee with Harbor Branch Executive Director Margaret Leinen, Ph.D.
- opportunities to participate in science immersion experiences and VIP tours hosted by Harbor Branch researchers
- home delivery of the *Harbor Branch Bulletin*
- discounts at the Ocean Discovery Center gift shop

For more information, or to share your ideas for potential new Friends activities, contact Cindy at 772-242-2226 or cwillso1@fau.edu.



Cindy Willson



Love Your Lagoon

LOVE YOUR LAGOON – A NIGHT TO REMEMBER

More than 175 lovers of the Indian River Lagoon (IRL) gathered at the HBOI Foundation's inaugural Love Your Lagoon dinner on February 10 to show their support for one of our region's most precious natural resources. Held on the plaza defined by the new Marine Science Laboratory II Building, the Edwin A. Link Building and the Harbor Branch canal, the event featured cocktails, music and the flavors of sustainably sourced seafood and local produce. An inspiring program honored renowned environmentalist and steadfast IRL supporter Nathaniel P. Reed.

"The Indian River Lagoon plays such a critical role in our region, and as a research institution located in the heart of this ecosystem, Harbor Branch is at the forefront of research and advocacy for this incomparable environmental resource," said Love Your Lagoon event chairman and Foundation board member Michael Minton.

The event raised nearly \$40,000, and all proceeds will be used to support Harbor Branch IRL research and to perpetuate the IRL Symposium, a research forum that was held the previous day and also is expected to become an annual event.

Special thanks go to event co-chairs Michael and Misty Minton and their host committee: Mike and Mimi Brown, Joe and Jennifer Duke, Ron and Kathy Edwards, Marilyn Link, Ed and Jacqui Thurlow-Lippisch, John and Marilyn McConnell and Tom and Sherry Plymale.

The event was made possible by the generosity of the following donors: PNC-Harbor Foundation; Evans Properties, Inc.; Joe and Jennifer Duke; John and Marilyn McConnell; Michael and Misty Minton; Dean, Mead, Minton & Zwemer; Jim and Bonita Seitz; Marilyn C. Link in memory of Shirley L. Minton; George and Joyce Moss; Saunders Real Estate; Eleanor G. Sexton; Bill and Laurie Stewart and Scripps Treasure Coast Newspapers. River Raffle donors included Motorized Kayak Adventures, Casa del Rio, Bill and Carol Barrows, Costa d'Este Beach Resort, Anita Prentice and Trew & Sons Jewelers.



Sherry Plymale, John McConnell and Dr. Margaret Leinen



Marsha Powers, Nicole Mader, Kevin Powers and Jenny and Michael Flaugh



Amy Galante, Jenny Flaugh and Jacqui Thurlow Lippisch



Dr. Joshua and Ashley Voss



Michael and Shannon Houser, Dr. Margaret Leinen and John McConnell



Ed Lippisch and Debbie and Keith Langley



Janet Alford



Marylou and Travis Robins, and Misty and Michael Minton



Michael and Shannon Houser



Michael and Jenny Flaugh



Dena Matthews, Cheryl Handy and Gwen Morris



Dr. Valerie Paul and Dr. Calvin Arnold

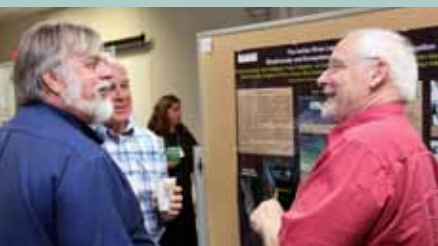
IRLS 2012 ended with a panel discussion on interfacing restoration research with policy in the Indian River Lagoon. From left to right: Amy Adams, Cape Canaveral Scientific, Inc.; Dr. Albrey Arrington, Loxahatchee River District; Mark Perry, Florida Oceanographic Society; Douglas Bournique, Indian River Citrus League & St. Johns River Water Management District Governing Board; Troy Rice, IRL National Estuarine Program; Paul Millar, South Florida Water Management District; not pictured: Dr. John Windsor, Florida Institute of Technology, who lead the panel discussion



Indian River Lagoon Symposium: A COLLABORATIVE WIN



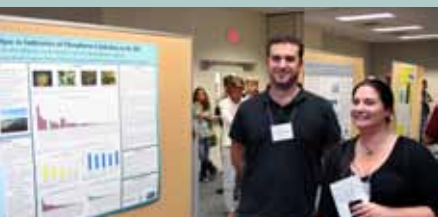
John Scarpa, Ph.D.



Dennis Hanisak, Ph.D. and Paul Hargraves, Ph.D.



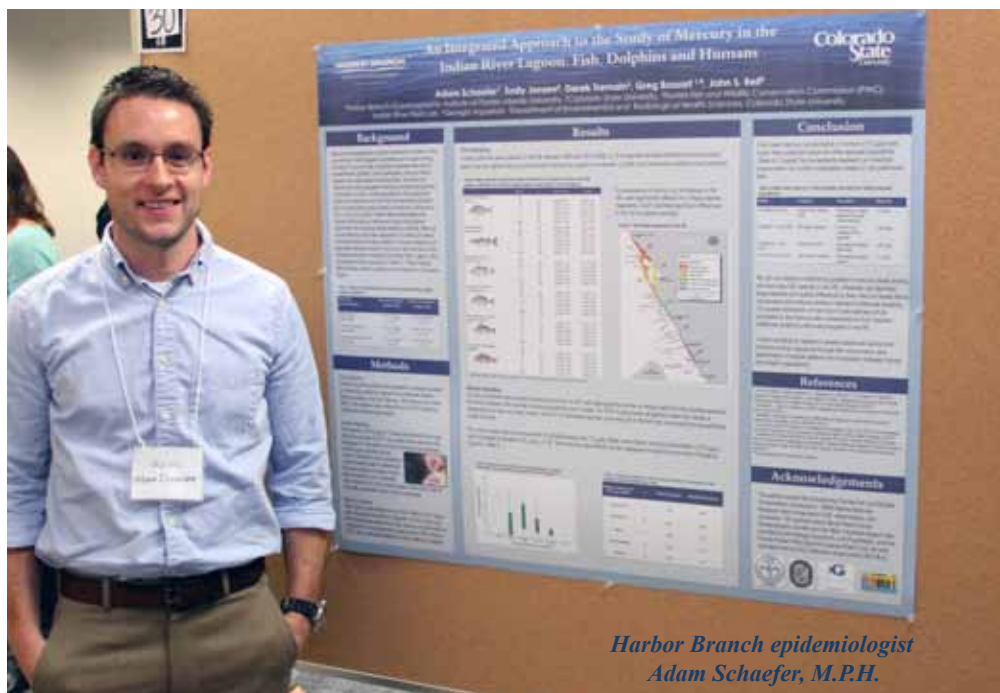
Luncheon



David Debortoli and Gabby Barbarite

Nearly 300 people attended the 2012 Indian River Lagoon Symposium, a full day of oral and poster presentations and panel discussions held at Harbor Branch in February and sponsored by the HBOI Foundation. The theme, "The Indian River Lagoon – Looking Forward," provided a framework for exchange and discussion of current IRL knowledge, research, monitoring and management issues among

researchers, students and agency decision makers and representatives. A primary discussion topic was restoration of the IRL, with emphasis on oyster reefs, mangroves and marshes, all vitally important habitats in the lagoon. In the coming months, www.indianriverlagoon.org will become the primary place for the public to learn about the work presented at this Symposium and future editions.



Harbor Branch epidemiologist Adam Schaefer, M.P.H.

Postdoc Population Swells

With a number of recent arrivals, the population of postdoctoral investigators at Harbor Branch is reaching new highs. The postdoctoral fellowship is an opportunity for newly minted Ph.D.s to lay career groundwork by focusing on research and publishing – productivity that also benefits the sponsoring institution. At Harbor Branch, postdoc appointments are supported by grant proposals or, for those within the FAU Postdoctoral

Investigator Program in Marine Science, Engineering and Technology (MarSET), Florida specialty license plate funds provided by the Harbor Branch Oceanographic Institute Foundation, Inc. MarSET postdocs have at least two faculty mentors representing both Harbor Branch and one or more FAU colleges, typically the Charles E. Schmidt College of Science or the College of Engineering and Computer Science.



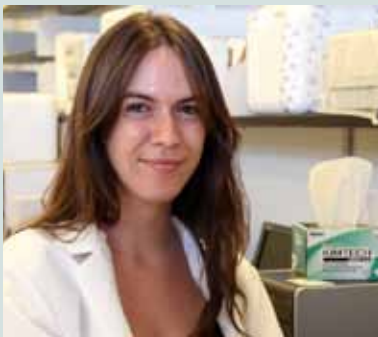
Nikki Dix, Ph.D.
Fisheries and Aquatic Sciences



Lauri Green, Ph.D.
Biology with an emphasis in marine ecology



Kayanne McCook-Russell, Ph.D.
Organic Chemistry



Heidi Pagan, Ph.D.
Molecular Biology



Vasilis Trygonis, Ph.D.
Fisheries Acoustics and Oceanography



Brunilda Vera, Ph.D.
Marine Natural Products Chemistry

The other current Harbor Branch postdoctoral investigators are Dr. Gero Nootz (Ocean Visibility and Optics Lab), Dr. Mikki McComb (Marine Ecosystem Health), Dr. Holly Nance (Community, Population &

Genetic Ecology), Dr. Georgios Kallifatidis, Dr. Floyd Russell and Dr. Priscilla Winder (Marine Biomedical and Biotechnology Research).

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Florida Atlantic University, a member of Florida's State University System, was established by legislative act in 1961. In addition to its original 850-acre campus in Boca Raton, FAU has campuses in Fort Lauderdale, Davie, Dania Beach, Jupiter, Port St. Lucie and Fort Pierce. Fully accredited by the Southern Association of Colleges and Schools, FAU is currently servicing 28,000 regularly enrolled, degree-seeking students through its 10 colleges. FAU's Harbor Branch Oceanographic Institute is dedicated to exploring the world's oceans--integrating the science and technology of the sea with the needs of humankind. Harbor Branch is involved in research and education in the marine sciences; biological, chemical, and environmental sciences; marine biomedical sciences; marine mammal conservation; aquaculture; and ocean engineering.



Wild Dolphins APP for iPad



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Harbor Branch

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ACTIVE START TO 2012 FOR MARINE MAMMAL CREW

It's been a busy year for Harbor Branch's Marine Mammal Research and Conservation Program (MMRC), with interventions involving a humpback whale stranded on the beach in Ft. Pierce, and two mother-calf dolphin pairs and another young dolphin entangled in monofilament fishing line. Program Manager Steve McCulloch, who serves as a capture lead for interventions authorized by the National Marine Fisheries Service, says that interventions are carefully considered and conducted only as a last resort. The MMRC team includes Juli Goldstein, D.V.M., Steve Burton and Kenny Kroell. YOU can help prevent entanglements: dispose of monofilament fishing line properly, do beach cleanups and show your support by purchasing a Protect Wild Dolphins Florida license plate.



Steve McCulloch directing the dolphin intervention.