5th Annual

LIFE SCIENCES SOUTH FLORIDA

UNDERGRADUATE

RESEARCH SYMPOSIUM

SATURDAY, APRIL 1, 2017

9AM to 3PM

PALM BEACH STATE COLLEGE

EISSEY CAMPUS

3160 PGA BLVD, PALM BEACH GARDENS, FL 33410

BIOSCIENCE TECHNOLOGY COMPLEX, SC127

RSVP at http://www.palmbeachstate.edu/forms/registration/Default.aspx?id=209

2017 Symposium Agenda

8:30am: Registration Opens (Bioscience Lobby):

- **Student** Check in & Poster/Oral Setup
- **Judge** Check-in Opens

8:45am: Breakfast Opens (BioScience, SC127 Auditorium)
9:15am: LSSF Remarks (LSSF Mission, Saif Ishoof, VP of Engagement, FIU)
9:20am: Opening Remarks (President Ava L. Parker, J.D., Palm Beach State College)
9:25am: Introduction of Keynote Speaker by PBSC Associate Dean Robert Van Der Velde
9:35am: Keynote Speaker, Karen Marcus, President of Sustainable PBC
10:05am: Presenter & Judge Instructions, Associate Dean Van Der Velde

10:10am-12:45pm: Student Presentations / Judging

- **Poster Presentations** (Done by ~11am): Rooms SC161 & SC114
  - SC 161: Posters # 1-50
  - SC 114: Posters #51-80
- **Oral Presentations**: (Done by ~12:45pm): Rooms SC169 & SC170
  - SC 169: Odd # Talks (# 1, 3, 5, 7, 9, 11, 13, 15, 17, 19)
  - SC 170: Even # Talks (# 2, 4, 6, 8, 10, 12, 14, 16, 18, 20)

**All Judges submit forms by 12:30pm to room SC143 (Alexina Alonso & Dr. Alexandra Gorgevska)*

11:00am-12:30pm: Tabling & PBSC Program Showcase (SC Lobby & SC150)
12:30pm- 1:45pm: Lunch/Speakers (SC127)

- 1:05pm: Introduction of Guest Speaker by Associate Dean Van Der Velde
- 1:10pm: Guest Speaker, Dr. Brian Paegel, TSRI Department of Chemistry
- 1:30pm: Introduction of Student Speaker by Associate Dean Van Der Velde
- 1:35pm-1:45pm: LSSF Student Success Story (Michael Butts, Process Scientist, Ocean Ridge Biosciences)

1:55-2:15pm: Awards Ceremony (Dr. Becky Mercer, Biotech & STEM Ed Director, PBSC)

- Judge & Volunteer Gifts
- Student Awards & Individual Photos
- Printer Raffle Drawing

2:15-2:20pm: Closing Remarks (Associate Dean Van Der Velde)
2:25pm: Group Photo/ Institution Photos
3:00pm: Dismissed

Office of the President
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Ava L. Parker, J.D., President

Dear Partners in Life Science Undergraduate Education,

I am delighted to welcome you to Palm Beach State College for the 5th Annual Life Sciences South Florida (LSSF) Undergraduate Research Symposium.

The LSSF, founded in 2010, has been instrumental in stimulating awareness of Science, Technology, Engineering and Math (STEM) industries via robust innovation and professional development. Through the development of collaborations with partner organizations, LSSF has worked to attract and retain life science businesses in South Florida, making it one of the fastest growing regions for technological innovation.

A STEM education is critically important to allow students to become innovators, educators, researchers, and leaders in this era of active growth. Today's event is fundamental for us as educators to provide our students with more than just an opportunity to present: it's a chance to interact, discuss and debate with colleagues from other institutions, and to further promote innovation, discovery, and collaboration.

Approximately 100 brilliant students are participating in the symposium this year, making it the largest event in our five year history. I encourage you to walk through and view the original scientific presentations in the poster section and listen to the selected student oral presentations as they present to the dedicated faculty judges. I am confident that you will be enlightened by the outstanding depth and breadth of knowledge that our South Florida students possess in the STEM fields.

Palm Beach State College is honored to host the 5th annual program in collaboration with LSSF and partner South Florida academic institutions to offer students the opportunity to exchange their scientific prowess and knowledge. It is only through these robust interactions that innovative discoveries are advanced for the benefit of our region.

We extend our wholehearted congratulations to the students presenting today and wish all of them success as they pursue their academic and professional goals.

Sincerely,

Ava L. Parker, J.D.
President

2017 LSSF Keynote Speaker

Karen Marcus

President, Sustainable PBC

She served as Palm Beach County Commissioner from 1984 to 2012. During her tenure, she gained a reputation as a strong force for sustainable practices to ensure the county's long-term success.

While Commissioners are elected by voters from their respective districts, Marcus championed a "countywide perspective" for the PBC Commission's work. Thanks to Marcus's efforts, northern Palm Beach County residents, businesses, and visitors enjoy both a robust economy and a rich range of parks, green spaces, recreational areas and other quality-of-life assets. In 2012, the Palm Beach County Commission voted to name 154 county-owned acres east of Route 1 in Jupiter the Karen Marcus Ocean Park Preserve. At the time, Marcus said, "It makes me feel like what I did made a difference. Land preservation and recreation are important to me, and this will give that to county residents."

Marcus has also served as President, Florida Association of County Commissioners and President, Florida Regional Planning Council Association. Prevented by term limits from seeking re-election in 2012, she formed a consulting company KMarcus Resource Group. Her firm advises clients on economic and environmental issues in Palm Beach County. Marcus currently serves on the Boards of Jupiter Maltz Theater, Loggerhead Marine Life Center, Abacoa POA, Friends of MacArthur Park, the Everglades Law Center, and Roger Dean Stadium Advisory Board. She co-founded Sustainable PBC with Lisa Interlandi in 2014 to "encourage sustainable solutions for the county's long-term future so that our children and great-grandchildren will have the same opportunity to enjoy the Florida we love and cherish."

2017 LSSF Guest Speaker

Brian Paegel, Ph.D.

Associate Professor, Department of Chemistry
The Scripps Research Institute, Florida Campus

Scripps Research Joint Appointments
Assistant Professor, Department of Molecular Therapeutics
Faculty, Graduate Program

Research Focus
All of contemporary biology and most chemistry is compartmentalized. For example, beakers, flasks or microplate wells spatially segregate individual chemical reactions. Likewise, membranes compartmentalize individual cells and subcellular organelles, tissues and organs organize the metabolism of multi-cellular organisms, and even organisms themselves are merely the vehicles for selfishly replicating genes in a population. Reaction vessels, seemingly innocuous entities, actually play starring roles in activities ranging from drug discovery laboratory automation and technology development to natural selection and the origins of life on Earth. We are broadly interested in the rational construction of microscopic reaction vessels and the interesting chemical and biological operations that we can conduct within their confines.

Education
B.S., Chemistry, Duke University, 1998
Ph.D., Chemistry, University of California, Berkeley, 2003

Professional Experience
2015-2017 Associate Professor, Molecular Therapeutics, The Scripps Research Institute
2009-2015 Assistant Professor, Chemistry, The Scripps Research Institute
2009-2015 Assistant Professor (Joint Appointment), Molecular Therapeutics, The Scripps Research Institute
2004-2008 Postdoctoral Fellow with Dr. Gerald Joyce, Molecular Biology, The Scripps Research Institute

Awards & Professional Activities
NSF CAREER Award (2013)
NIH Director's New Innovator Award (2011)
NIH Pathway to Independence Award (2007)
NIH NRSA Postdoctoral Fellow (2004)

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2017 LSSF Student Speaker

Michael Butts

Winner, 2012 LSSF Symposium (oral presentation)

PBSC Biotechnology A.S. graduate

Michael earned his Associate of Science degree in Biotechnology from Palm Beach State College in 2012. During his tenure at the College, he gained skills in molecular biology, such as DNA and RNA isolation, polymerase chain reaction (PCR), agarose gel electrophoresis, western blotting of proteins, plate-based enzyme assays, culture of mammalian cells, using Excel to graph and organize data, keep an organized and legible laboratory notebook. His molecular biology and cell culture skills, along with his outgoing personality led him to be accepted into a summer internship and ultimately be hired as an Associate Scientist at Cytonics Corporation in Jupiter, Fl. Michael presented his internship work at Cytonics at the 2012 Life Sciences South Florida (LSSF) Undergraduate Research Symposium held at Miami Dade College and won **First Place** in the Oral competition for his talk entitled, *Polyethylenimine as an Effective Transfection Reagent for Mammalian Cells.* Michael is a strong advocate for science and for life science education, and is committed to serving as an ambassador for Palm Beach State College. Michael is currently working in the field of genomics and biomarker discovery at Deerfield Beach biotechnology company Ocean Ridge Biosciences as a Process Scientist.

Top photo: Michael speaks to an auditorium of high school juniors and seniors from Tecnologico de Monterrey, Mexico about his biotech's involvement in green projects.

Left photo: Michael speaks to college students at Ocean Ridge Biosciences about explained the utility and general process of our genomic-based services, including RNA sequencing, microarrays for microRNA and gene expression, and multiplex immunoassays.

Welcome NEW LSSF Member

Florida Memorial University

LSSF would like to extend a warm welcome to our newest member, Florida Memorial University! Florida Memorial University (FMU) is a private four-year, co-educational liberal arts institution, accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS-COC).

Located in Miami Gardens, Florida, FMU offers 41 undergraduate degree programs and 4 master's programs. With this comprehensive selection of majors and numerous extracurricular activities to hone their skills in academics, leadership and public service, a college experience at FMU results in highly sought-after graduates and solid world citizens. We are so glad that they have joined the work of LSSF!

At this year's 5th Annual LSSF STEM Undergraduate Research Symposium, five FMU undergraduates are joining us and their research topics include: *the effects of runoff on water quality of urban ponds*; *in vitro anticancer activity of indanocine analogues; cardiac fibroblasts functionality under the influence of TH2 cytokines; halogenated analogues of acetylsalicylic acid (aspirin) and effects on the growth and development of solanum lycopersicum var. cerasiforme; and sub-chronic of 6-hydroxydopamine on mitochondrial quality control* will be presented by these committed FMU students. FMU faculty are attending this year, and serve as judges of other student presentations.

Be sure to give a hearty LSSF welcome to our new friends from FMU!

LSSF New Category: Student Innovation

A new category for the LSSF Symposium this year is Student Innovation. These projects highlight the innovation and creativity of life science students in South Florida member institutions with either a product under development, patent-pending technology, technological process or device, or company.

The following students will be showcasing their innovative projects/companies during the lunchtime showcase. These talented individuals are part of StartUp FIU.

1. **Carolina Hoyos**, Founder of Benbo
   "The most interactive, simple and easy to use business networking app that will help you create, customize exchange and scan business cards"

2. **Jose Maldonado**, Founder of Pilot VR
   "All-in-one affordable VR system aimed at physical therapy"

3. **Andrea Saldriagas**, Founder of Master Honey
   "We empower low-income women to start their own micro beekeeping business and sell us the urban honey they produce for commercialization"

Industry and Graduate School Showcase

During the lunch program this year we will showcase the following:

PBSC's Ophthalmic Medical Technology Program

PBSC Engineering Technology 3D Printing & Scanning

Regional Life Science Companies

Graduate Schools and Training Opportunities

A special Thank You to those volunteering their Saturday to serve our students during the showcase!

2017 LSSF Presentation and Judging Assignments (Oral)

Name	Institution	Presentation Format	Talk/ Poster #	Oral Presentation Time	Room # SC	Judges
Fabio Frech	Barry University	Oral	1	10:10am	SC 169	Leo Lagos, Alessandra Manzon, Russell Betts
Toriean Gordon	Barry University	Oral	2	10:10am	SC 170	Marilyn Sherman, Nilo Marin, Emmanuel Vrotsos
Zachary Lee	Florida Atlantic University	Oral	3	10:25am	SC 169	Leo Lagos, Yu-Wai Peter Lin, Megan Carroll
-	-	Oral	4	10:25am	SC 170	n/a
Mariangelica Banasco & Samantha Rodriguez	Florida International University	Oral	5	10:40am	SC 169	Mare Cudic, Roberto Cabezas, Ava Bittner
Gene Yllanes	Florida International University	Oral	6	10:40am	SC 170	Patchara Pongam, Christopher Blanar, Sankaranarayana Chandramohan
Diarra Dia	Florida Memorial University	Oral	7	10:55am	SC 169	Rose Mary Stiffin, Robert Smith, Vetaley Stashenko
Brittney Osborne	Florida Memorial University	Oral	8	10:55am	SC 170	Charles Gunnels, Andrew Trupin, Maria Pina
Alex Deulio	Indian River State College	Oral	9	11:10am	SC 169	Brenda Schoffstall, Alexis Tapanes-Castillo, Aisha Khan
Jorge Monroy	Indian River State College	Oral	10	11:10am	SC 170	Carolyn Margolin, Teresa Petrino-Lin, Jonathan Banks
Valerie Dominguez	Miami Dade College	Oral	11	11:25am	SC 169	Jaime Tartar, Alessandra Manzon, Sankaranarayana Chandramohan
Maria Giraldo	Miami Dade College	Oral	12	11:25am	SC 170	Leo Lagos, Marilyn Sherman, Yu-Wai Peter Lin
Ezana Assefa	Nova Southeastern University	Oral	13	11:40am	SC 169	Helen Wiersma-Koch, Rose Mary Stiffin, Brenda Schoffstall
Alisha Trivedi	Nova Southeastern University	Oral	14	11:40am	SC 170	Tracy Baker, Russell Betts, Christopher Blanar
Rebecca Stremel	Palm Beach State College	Oral	15	11:55am	SC 169	Thaddeus McRae, Vasileios Anagnostopoulos, Carolyn Margolin
Arthur Zahreciyan	Palm Beach State College	Oral	16	11:55am	SC 170	Soumia Souchak, Tracy Baker, Maria Pina
Jose Calera	St. Thomas University	Oral	17	12:10pm	SC 169	Carlos Ramos, Ava Bittner, Charles Gunnels
Leana Ramos	St. Thomas University	Oral	18	12:10pm	SC 170	Enrique Salero, Megan Carroll, Robert Smith
Alyssa Laffitte	University of Miami	Oral	19	12:25pm	SC 169	Pilar Maul, Leo Lagos, Carlos Ramos
Xiaoyao Qiao	University of MIami	Oral	20	12:25pm	SC 170	Teresa Petrino-Lin, Tod Fairbanks, Jaime Tartar

Presentation and Judging Assignments (Posters)

Name	Institution	Presentation Format	Talk/ Poster #	Oral Presentation Time	Room # SC	Judges
Jocelyn Baquier	Barry University	Poster	1	10:10am-12:40pm	SC 161	Paul Horton, Enrique Salero, Vetaley Stashenko
Samantha Britz	Barry University	Poster	2	10:10am-12:40pm	SC 161	Alessandra Manzon, Aisha Khan, Andrew Trupin
Julian Dasilva	Barry University	Poster	3	10:10am-12:40pm	SC 161	Helen Wiersma-Koch, Alexis Tapanes-Castillo, Soumia Souchak
Ricardo Gomez	Barry University	Poster	4	10:10am-12:40pm	SC 161	Roberto Cabezas, Patchara Pongam, Mare Cudic
Jose Gomez	Barry University	Poster	5	10:10am-12:40pm	SC 161	Jonathan Banks, Emmanuel Vrotsos, Thaddeus McRae
-	-	Poster	6	10:10am-12:40pm	SC 161	Vasileios Anagnostopoulos, Nilo Marin, Carolyn Margolin
Gabriela Lin	Barry University	Poster	7	10:10am-12:40pm	SC 161	Rose Mary Stiffin, Pilar Maul, Ava Bittner
Arin Blake	Barry University	Poster	8	10:10am-12:40pm	SC 161	Alessandra Manzon, Tod Fairbanks, Robert Smith
Roland Schiller	Barry University	Poster	9	10:10am-12:40pm	SC 161	Ava Bittner, Nilo Marin, Jonathan Banks
Cynthia Socarras	Barry University	Poster	10	10:10am-12:40pm	SC 161	Robert Smith, Paul Horton, Carlos Ramos
William Grossman	Broward College	Poster	11	10:10am-12:40pm	SC 161	Marilyn Sherman, Christopher Blanar, Enrique Salero
Camelia Garcia	Florida Atlantic University	Poster	12	10:10am-12:40pm	SC 161	Vasileios Anagnostopoulos, Roberto Cabezas, Enrique Salero
Jonathan Rivera	Florida Atlantic University	Poster	13	10:10am-12:40pm	SC 161	Christopher Blanar, Keysner Boet, Vasileios Anagnostopoulos
Danielle Bartz	Florida Atlantic University	Poster	14	10:10am-12:40pm	SC 161	Helen Wiersma-Koch, Russell Betts, Megan Carroll
Joubin Jebelli	Florida Atlantic University	Poster	15	10:10am-12:40pm	SC 161	Rose Mary Stiffin, Yu-Wai Peter Lin, Ava Bittner
Vanessa Walters	Florida Atlantic University	Poster	16	10:10am-12:40pm	SC 161	Marilyn Sherman, Soumia Souchak, Vetaley Stashenko
Nicholas Lauta	Florida Gulf Coast University	Poster	17	10:10am-12:40pm	SC 161	Vasileios Anagnostopoulos, Teresa Petrino-Lin
Charles Wallace	Florida Gulf Coast University	Poster	18	10:10am-12:40pm	SC 161	Megan Carroll, Yu-Wai Peter Lin, Vetaley Stashenko
Ryan Williams	Florida Gulf Coast University	Poster	19	10:10am-12:40pm	SC 161	Soumia Souchak, Paul Horton, Andrew Trupin
Brian Garcia Rodriguez	Florida International University	Poster	20	10:10am-12:40pm	SC 161	Emmanuel Vrotsos, Brenda Schoffstall, Andrew Trupin
Gretel Arcia Gonzalez	Florida International University	Poster	21	10:10am-12:40pm	SC 161	Tracy Baker, Patchara Pongam, Christopher Blanar
Danielle Hatt	Florida International University	Poster	22	10:10am-12:40pm	SC 161	Yu-Wai Peter Lin, Roberto Cabezas, Pilar Maul
Alexander Piedra	Florida International University	Poster	23	10:10am-12:40pm	SC 161	Jaime Tartar, Russell Betts, Carolyn Margolin
Ripley Raubenolt	Florida International University	Poster	24	10:10am-12:40pm	SC 161	Patchara Pongam, Tod Fairbanks, Keysner Boet
Frances Zengotita	Florida International University	Poster	25	10:10am-12:40pm	SC 161	Vetaley Stashenko, Nilo Marin, Paul Horton
Patria Henry	Florida Memorial University	Poster	26	10:10am-12:40pm	SC 161	Roberto Cabezas, Megan Carroll, Helen Wiersma-Koch
Jelonia Rumph	Florida Memorial University	Poster	27	10:10am-12:40pm	SC 161	Andrew Trupin, Brenda Schoffstall, Jonathan Banks
Neugenia Joseph	Florida Memorial University	Poster	28	10:10am-12:40pm	SC 161	Ava Bittner, Thaddeus McRae, Patchara Pongam
Amanda Antosh	Indian River State College	Poster	29	10:10am-12:40pm	SC 161	Russell Betts, Carolyn Margolin, Teresa Petrino-Lin
Allison Wright	Indian River State College	Poster	30	10:10am-12:40pm	SC 161	Carlos Ramos, Soumia Souchak, Brenda Schoffstall
Andrew Cassaniti	Indian River State College	Poster	31	10:10am-12:40pm	SC 161	Mare Cudic, Keysner Boet, Robert Smith
Frank Manthey	Indian River State College	Poster	32	10:10am-12:40pm	SC 161	Sankaranarayana Chandramohan, Jaime Tartar, Alexis Tapanes-Castillo
Ashley Petticrew	Indian River State College	Poster	33	10:10am-12:40pm	SC 161	Carolyn Margolin, Leo Lagos, Carlos Ramos
Gabriel DeAvila	Indian River State College	Poster	34	10:10am-12:40pm	SC 161	Pilar Maul, Aisha Khan, Charles Gunnels
Jordan Marshall	Indian River State College	Poster	35	10:10am-12:40pm	SC 161	Maria Pina, Mare Cudic, Alessandra Manzon
Alexandre Roy	Indian River State College	Poster	36	10:10am-12:40pm	SC 161	Robert Smith, Vasileios Anagnostopoulos, Pilar Maul
Leonardo Albertini	Miami Dade College	Poster	37	10:10am-12:40pm	SC 161	Thaddeus McRae, Jaime Tartar, Aisha Khan
Summer Alsadah	Miami Dade College	Poster	38	10:10am-12:40pm	SC 161	Emmanuel Vrotsos, Sankaranarayana Chandramohan, Aisha Khan
Sajune Blanchard	Miami Dade College	Poster	39	10:10am-12:40pm	SC 161	Jonathan Banks, Maria Pina, Vetaley Stashenko
Gabriel Blanco	Miami Dade College	Poster	40	10:10am-12:40pm	SC 161	Alexis Tapanes-Castillo, Enrique Salero, Sankaranarayana Chandramohan

Presentation and Judging Assignments (Posters continued)

Name	Institution	Presentation Format	Talk/ Poster #	Oral Presentation Time	Room # SC	Judges
Madeline Demateo	Miami Dade College	Poster	41	10:10am-12:40pm	SC 161	Aisha Khan, Helen Wiersma-Koch, Ava Bittner
Daniel Diaz	Miami Dade College	Poster	42	10:10am-12:40pm	SC 161	Enrique Salero, Mare Cudic, Marilyn Sherman
Maria Jose Garavito	Miami Dade College	Poster	43	10:10am-12:40pm	SC 161	Vetaley Stashenko, Tracy Baker, Paul Horton
Lorena Gonzalez	Miami Dade College	Poster	44	10:10am-12:40pm	SC 161	Teresa Petrino-Lin, Nilo Marin, Alessandra Manzon
Ivana Iser	Miami Dade College	Poster	45	10:10am-12:40pm	SC 161	Tod Fairbanks, Charles Gunnels, Tracy Baker
Katrina Kostenko	Miami Dade College	Poster	46	10:10am-12:40pm	SC 161	Alexis Tapanes-Castillo, Thaddeus McRae, Nilo Marin
Denise Machado	Miami Dade College	Poster	47	10:10am-12:40pm	SC 161	Maria Pina, Vasileios Anagnostopoulos, Rose Mary Stiffin
Denis Ortega	Miami Dade College	Poster	48	10:10am-12:40pm	SC 161	Yu-Wai Peter Lin, Emmanuel Vrotsos, Megan Carroll
Roodelyne Pierrelus	Miami Dade College	Poster	49	10:10am-12:40pm	SC 161	Pilar Maul, Leo Lagos, Russell Betts
Naomi Suazo	Miami Dade College	Poster	50	10:10am-12:40pm	SC 161	Carlos Ramos, Emmanuel Vrotsos, Alexis Tapanes-Castillo
Lindsay Craig	Nova Southeastern University	Poster	51	10:10am-12:40pm	SC 114	Nilo Marin, Thaddeus McRae, Keysner Boet
Eileen Davidson	Nova Southeastern University	Poster	52	10:10am-12:40pm	SC 114	Alexis Tapanes-Castillo, Yu-Wai Peter Lin, Emmanuel Vrotsos
Andrew Gonedes	Nova Southeastern University	Poster	53	10:10am-12:40pm	SC 114	Keysner Boet, Roberto Cabezas, Helen Wiersma-Koch
Chelsea Mathews	Nova Southeastern University	Poster	54	10:10am-12:40pm	SC 114	Aisha Khan, Teresa Petrino-Lin, Leo Lagos
Reaghan May	Nova Southeastern University	Poster	55	10:10am-12:40pm	SC 114	Paul Horton, Brenda Schoffstall, Charles Gunnels
Kendall Mockridge	Nova Southeastern University	Poster	56	10:10am-12:40pm	SC 114	Sankaranarayana Chandramohan, Maria Pina, Patchara Pongam
Brooke Munion	Nova Southeastern University	Poster	57	10:10am-12:40pm	SC 114	Brenda Schoffstall, Pilar Maul, Aisha Khan
Melanie Perez	Nova Southeastern University	Poster	58	10:10am-12:40pm	SC 114	Soumia Souchak, Emmanuel Vrotsos, Enrique Salero
Stacey Spadafore	Nova Southeastern University	Poster	59	10:10am-12:40pm	SC 114	Enrique Salero, Megan Carroll, Roberto Cabezas
-	-	Poster	60	10:10am-12:40pm	SC 114	n/a
Marsha Zaman	Nova Southeastern University	Poster	61	10:10am-12:40pm	SC 114	Teresa Petrino-Lin, Tod Fairbanks, Alessandra Manzon
Kendra Melos	Palm Beach State College	Poster	62	10:10am-12:40pm	SC 114	Jaime Tartar, Rose Mary Stiffin, Mare Cudic
Emily Mirkin	Palm Beach State College	Poster	63	10:10am-12:40pm	SC 114	Charles Gunnels, Marilyn Sherman, Maria Pina
Natasha Astudillo	St. Thomas University	Poster	64	10:10am-12:40pm	SC 114	Christopher Blanar, Paul Horton, Charles Gunnels
Raul Banos	St. Thomas University	Poster	65	10:10am-12:40pm	SC 114	Andrew Trupin, Christopher Blanar, Vasileios Anagnostopoulos
Luis Cendan	St. Thomas University	Poster	66	10:10am-12:40pm	SC 114	Carolyn Margolin, Mare Cudic, Keysner Boet
Jennifer Cerda	St. Thomas University	Poster	67	10:10am-12:40pm	SC 114	Vetaley Stashenko, Rose Mary Stiffin, Yu-Wai Peter Lin
Laynet Cornelio	St. Thomas University	Poster	68	10:10am-12:40pm	SC 114	Tracy Baker, Ava Bittner, Roberto Cabezas
Marrisa Lee	St. Thomas University	Poster	69	10:10am-12:40pm	SC 114	Thaddeus McRae, Jonathan Banks, Leo Lagos
Milagros Mulero	St. Thomas University	Poster	70	10:10am-12:40pm	SC 114	Carlos Ramos, Patchara Pongam, Russell Betts
Kelly O'Reilly	St. Thomas University	Poster	71	10:10am-12:40pm	SC 114	Keysner Boet, Teresa Petrino-Lin, Thaddeus McRae
Kasey Rivera	St. Thomas University	Poster	72	10:10am-12:40pm	SC 114	Megan Carroll, Tod Fairbanks, Marilyn Sherman
Daniel Russo	St. Thomas University	Poster	73	10:10am-12:40pm	SC 114	Andrew Trupin, Alessandra Manzon, Sankaranarayana Chandramohan
Claudia Cabrera	University of Miami	Poster	74	10:10am-12:40pm	SC 114	Brenda Schoffstall, Carolyn Margolin, Helen Wiersma-Koch
Dilraj Cambow	University of Miami	Poster	75	10:10am-12:40pm	SC 114	Patchara Pongam, Sankaranarayana Chandramohan, Soumia Souchak
Zoe Cosner	University of Miami	Poster	76	10:10am-12:40pm	SC 114	Nilo Marin, Robert Smith, Christopher Blanar
Esmail Miyanji	University of Miami	Poster	77	10:10am-12:40pm	SC 114	Charles Gunnels, Tracy Baker, Tod Fairbanks
Divya Sha	University of Miami	Poster	78	10:10am-12:40pm	SC 114	Mare Cudic, Jonathan Banks, Soumia Souchak
Frederic Vallejo	University of Miami	Poster	79	10:10am-12:40pm	SC 114	Russell Betts, Helen Wiersma-Koch, Jaime Tartar
Éamonn Byrnes	Florida Atlantic University	Poster	80	10:10am-12:40pm	SC 114	Paul Horton, Keysner Boet, Jonathan Banks

Judging Assignments (in order of affiliation)

Note: O = Oral Presentations. P = Poster Presentation.

Judge	Home Institution	Judging Presentations #:
Yu-Wai Peter Lin	Barry University	O3, O12, P15, P18, P22, P48, P52, P67
Teresa Petrino-Lin	Barry University	O10, O20, P17, P29, P44, P54, P61, P71
Brenda Schoffstall	Barry University	O9, O13, P20, P27, P30, P55, P57, P74
Russell Betts	Broward College	O1, O14, P14, P23, P29, P49, P70, P79
Nilo Marin	Broward College	O2, P9, P25, P44, P46, P51, P76
Thaddeus McRae	Broward College	O15, P5, P28, P37, P46, P51, P69, P71
Emmanuel Vrotsos	Broward College	O2, P5, P20, P38, P48, P50, P52, P58
Tracy Baker	Florida Atlantic University	O14, O16, P21, P43, P45, P68, P77
Mare Cudic	Florida Atlantic University	O5, P4, P31, P35, P42, P62, P66, P78
Vasileios Anagnostopoulos	Florida International University	O15, P12, P13, P17, P36, P47, P65
Leo Lagos	Florida International University	O1, O3, O12, O19, P33, P49, P54, P69
Charles Gunnels	Florida Gulf Coast University	O8, O17, P34, P45, P55, P63, P64, P77
Alessandra Manzon	Florida Memorial University	O1, O11, P2, P8, P35, P44, P61, P73
Marilyn Sherman	Florida Memorial University	O2, O12, P11, P16, P42, P63, P72
Rose Mary Stiffin	Florida Memorial University	O7, O13 P7, P15, P47, P62, P67
Megan Carroll	Indian River State College	O3, O18, P14, P18, P26, P48, P59, P72
Paul Horton	Indian River State College	P1, P10, P19, P25, P43, P55, P64, P80
Patchara Pongam	Indian River State College	O6, P4, P21, P24, P28, P56, P75, P70
Helen Wiersma-Koch	Indian River State College	O13, P3, P14, P26, P41, P53, P74, P79
Keysner Boet	Miami Dade College	P13, P24, P31, P51, P53, P66, P71, P80
Roberto Cabezas	Miami Dade College	O5, P4, P12, P22, P26, P53, P59, P68
Carolyn Margolin	Miami Dade College	O10, O15, P23, P29, P33, P66, P74
Soumia Souchak	Miami Dade College	O16, P3, P16, P19, P30, P58, P75, P78
Jonathan Banks	Nova Southeastern University	O10, P5, P9, P27, P39, P69, P78, P80
Ava Bittner	Nova Southeastern University	O5, O17, P7, P9, P15, P28, P41, P68
Christopher Blanar	Nova Southeastern University	O6, O14, P11, P13, P21, P64, P65, P76
Robert Smith	Nova Southeastern University	O7, O18, P8, P10, P31, P36, P76
Jaime Tartar	Nova Southeastern University	O11, O20, P23, P32, P37, P62, P79
Sankaranarayana Chandramohan	Palm Beach State College	O6, O11, P32, P38, P40, P56, P73, P75
Tod Fairbanks	Palm Beach State College	O20, P8, P24, P45, P61, P72, P77
Alexandra Gorgevska	Palm Beach State College	Alternate
Becky Mercer	Palm Beach State College	Alternate
Carlos Ramos	Palm Beach State College	O17, O19, P10, P30, P33, P50, P70
Vetaley Stashenko	Palm Beach State College	O7, P1, P16, 18, P25, P39, P43, P67
Andrew Trupin	Palm Beach State College	O8, P2, P19, P20, P27, P65, P73
Pilar Maul	St. Thomas University	O19, P7, P22, P34, P36, P49, P57
Maria Pina	St. Thomas University	O8, O16, P35, P39, P47, P56, P63
Alexis Tapanes-Castillo	St. Thomas University	O9, P3, P32, P40, P46, P50, P52
Aisha Khan	University of Miami	O9, P2, P34, P37, P38, P41, P54, P57
Enrique Salero	University of Miami	O18, P1, P11, P12, P40, P42, P58, P59

2017 LSSF ORAL PRESENTATIONS

Oral Presentation #1

Pathological stress in zebrafish hearts using extreme hypoxia exposure

Fabio Frech, Gabriela Hernandez, Johan Sanchez, and Brenda Schoffstall Ph.D.
Department of Biology, College of Arts & Sciences, Barry University, Miami Shores, FL.

Abstract

Although human cardiomyocytes are capable of some cell division, this response can neither repair damaged hearts, nor efficiently compensate for pathological stress. However; *Danio rerio* (zebrafish) cardiomyocytes are capable of proliferation to repair pathological damage. Here, we report a new zebrafish cardiac stress model using extreme hypoxia exposure as a negative stressor to induce pathological cardiomyocyte damage. We have developed a chemical-free model, using a simple anaerobic incubation tank to induce hypoxia. Our measurements demonstrate that after 2 hours' exposure in the hypoxia chamber, dissolved oxygen (DO) in individual fish tubes are reduced by an average of 81%, when compared to water exposed to normal atmospheric conditions. Following re-exposure to normal oxygen levels, we dissect hearts to study specific effects on cardiac tissue, either immediately following damage or during the reperfusion and repair process. We have used fluorescent labels to detect nitroreductase activity and reactive oxygen species (ROS) production—both indicators of hypoxic damage—to study effects on hearts immediately following hypoxia under the described conditions. Epicardial, pericardial, and myocardial tissues appear to exhibit detectable ROS production, while only myocardial tissue appears to demonstrate nitroreductase activity. Our novel hypoxia/reperfusion model will be used in future investigations to follow cardiac regeneration over time and identify molecular mechanisms that may act as a "switch" to turn on proliferation in zebrafish cardiomyocytes to repair the hypoxic damage. Findings could promote investigation of targeted molecular therapies to treat human cardiac disease. Support: NIH-NIGMS RISE Award, R25 GM059244-16, Barry University.

Oral Presentation #2

Laterality in an arthropod: the fruit fly *Drosophila melanogaster*

Toriean Gordon; Beatriz Alvarez; Tyler Bonner; Seth.DeRuggiero; Demarkis Dormer; Isabella Duarte; Angela Duff; Naomi Garcia; Alexia.Hunter; Anthony Jackson; Kyle McHugh; Lilyveth Mesa; Genesis Munoz; Jeremiah Paul; Donald.Streater; Isaias Trujillo; Alexis Williams; Anastasia Zharova; Michael Robinson Ph.D.
Department of Biology, College of Arts & Sciences, Barry University, Miami Shores, FL.

Abstract

Laterality is the preference of an organism for one side of their body one type of which is handedness (i.e., the preferences for the use of a certain hand). Laterality has been identified across a number of animal taxa and it probably has a strong relationship with brain function leading to efforts to understand the causes and consequences of laterality. We investigated laterality in

wingless fruit flies (*Drosophila melanogaster*) using Y-mazes and allowing individual flies to turn left or right. Individual flies were observed up to six times. Across the population, there was a small but significant preference for left-turns during the first trial (109 left vs. 99 right; binomial test: $p = 0.043$). Each fly with more than one trial was scored with an index of the proportion of left-turns (i.e., always turned right = 0, always turned left = 1). The mean index across flies indicated a significant tendency to turn left ($\bar{x} = 0.550 \pm 0.305$; one-sample t-test: $n = 171$; $p = 0.032$). The most clear result was that individual flies have a preferred laterality. Fewer than 39% switched their turn decision from the first trial to the second which was significantly lower than the 50% as predicted by random turning (Fisher's exact test: $p = 0.004$). The preference to turn left is similar to the laterality of another species of fly that prefers to display its left side during agonistic encounters. (Funding was provided by the NIH-NIGMS MBRS RISE: R25 GM059244-16 awarded to Barry University.)

Oral Presentation #3

Comparison of floatation and candling for estimating Snowy Egret and Tricolored Heron egg age

Zachary J. Lee, David A. Essian, Dale E. Gawlik, Ph.D.
Florida Atlantic University

Abstract

Nest success is a common demographic metric for determining the status of avian populations. Application of egg aging techniques such as floating and candling may improve estimates of nest success and better predict population change. We compared the variance and accuracy of both techniques to calculated values of egg age for snowy egrets (n=178 eggs) and tricolored herons (n=76 eggs) nesting at Lake Okeechobee in 2016. Nests were selected haphazardly and each egg therein was floated and candled weekly until hatched. We back-calculated nest initiation date by subtracting published incubation length from the known hatch date and adjusting for egg laying order. We compared the variance and mean difference between calculated nest initiation date and estimates obtained from floating and candling. The eggs of the two species are indistinguishable so the data were pooled. Floating (-0.358 ± 0.217 SE) was more precise and accurate at determining nest age than was candling (2.13 ± 0.256 SE). Floating and candling were comparably easy to perform but clouds and canopy coverage could limit the feasibility of candling. Thus, egg floatation is the recommended method for estimating the age of small heron eggs in the wild. While no new data is being collected, the data continues to be analyzed to determine whether the observed differences are significant.

Oral Presentation #5

The use of *Dictyota* as a bioindicator of differential nutrient availability in high and low relief reefs in the Florida Keys.

Samantha Rodriguez, Mariangelica Banasco*, Alain Duran, Laura Palma, Deron E. Burkepile, Ph.D., and Ligia Collado-Vides, Ph.D.*

Florida International University, Miami, Fl.

Understanding the impact of nutrients in the functioning of widely thought oligotrophic ecosystems is critical in order to predict changes and proposed management strategies. In coral reefs, primary producers, such as macroalgae, uptake nutrients (e.g. nitrogen and phosphorous) and keep energy flowing towards higher trophic levels. Thus, the availability of nutrients in an oligotrophic ecosystem such as coral reefs, depends on the recycling via animal wastes. We used *Dictyota*, a genus commonly found among coral reefs in the Florida Keys Marine Sanctuary, to measure nutrient availability, carbon (C), nitrogen (N), and phosphorous (P), among sites with distinct rugosity and fish abundance. It was expected that sites with higher rugosity would have more fish abundance, which would result in higher nutrient availability for primary producers. We collected *Dictyota* samples during July and August of 2016, the wet season in south Florida. Samples were processed independently for CNP at the FIU seagrass research lab. It was found that reefs with high rugosity, maintained the highest concentrations of carbon, nitrogen, and phosphorus while lower rugosity sites showed the lowest. Our results show a correlation between rugosity and nutrient availability. This can be explained by the fact that rugosity has a positive impact on fish abundance, which, in turn, provides high amounts of nutrient availability for primary producers. These results demonstrate the importance of links between habitat heterogeneity and nutrient cycling in an oligotrophic ecosystem.

Oral Presentation #6

T-rex: a multipurpose all-terrain robotic platform

Gene Yllanes, and Anthony Abrahao

Florida International University, Miami, Fl.

Abstract

A robotic platform is under development at Florida International University's Applied Research Center (FIU ARC) for inspection and deployment in high-level waste (HLW) tasks. Funded by the Department of Energy Office of Environmental Management (DOE-EM) and the Department of Defense (DOD), this research is focused on developing small robotic tools to assist in deactivation and decommissioning of former nuclear production facilities such as the Savannah River Site or Hanford Site. The platform works wirelessly over a 2.4GHz frequency, is capable of running for 5 hours continuously and utilizes an Intel Edison Compute Module for communication and controls. Now that the power and controls system of this robot are performance-tested, the development of a robotic arm is in development.

Oral Presentation #7

Title: Synthesis, Partial Characterization, and *In Vitro* Anticancer Activity of Indanocine Analogues Bearing Indanone-Aldehyde Rings Putatively Targeting Tubulin

Diarra Dia, Dr. Rose Mary Stiffin, Dr. Kenneth Doxsee, Dr. James Hutchison, Dr. Mohammed Nayel, Dr. Cesar Ramirez, Dr. Alexandro Lima, Dr. Duane Miller, Dr. Xiangming Kong, Aissata Dia, Josymar Travieso, Lelani Bellieni, and Charlissa Whyms, Florida Memorial University, Miami Gardens, Fl.

Abstract

In search of potential therapeutics for cancer, the aim of this study was to describe the solid-state, base-catalyzed synthesis and partial characterization of a series of 2- indanone and 1-indanone derivatives coupled to various substituted benzaldehydes and to evaluate their anti-cancer activity using the NCI 60 Cancer Cell Line. It was hypothesized that the synthesized compounds (iden-1/2-ones) had anti-cancer activity and the halogenated indenones will have higher anti-cancer activity than the non-halogenated indenones. The synthesis of the compounds was done by using Aldol condensation, in which various indanones were coupled with various aromatic aldehydes, using stoichiometric amounts of NaOH as the solid phase catalyst. Spectral data to confirm the structures of the compounds (GC-MS, ^{1}H – NMR, and ^{13}C – NMR) were conducted. Purity was also determined using Thin Layer Chromatography (TLC) and melting point. The anticancer effects were evaluated according to the National Cancer Institute (NCI) screening protocol. The tested compounds were over 95% pure and showed moderate to good (50 – 90% growth inhibition) anticancer activity in one-dose (10 µM). The most active compound of the series was (2Z) – 2 – [(2, 4 – dimethoxy) methylidene – 3H – 4 – bromo] – Inden – 1 – one, which showed mean growth percent of 68.49% in one-dose assay. It was found that halogenated indenones had higher anti-cancer activity than non-halogenated one's. It is unclear as of yet what the target is within the cells; however, the compound bears a striking resemblance to indanocine, a compound that was purported to be a tubulin inhibitor, binding similar to colchicine.

Oral Presentation #8

Synthesis and characterization of halogenated analogues of acetylsalicylic acid (aspirin) and effects on the growth and development of S*olanum lycopersicum* var. *cerasiforme*

Brittney Osborne, and Dr. Rose Mary Stiffin Advisor, Ph.D.
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Abstract

Acetylsalicylic acid (ASA) commonly known as aspirin is an analgesic, antipyretic, and anti-inflammatory over-the-counter drug that has been used throughout the centuries to treat common aliments in individuals. Salicin, which lead to salicylic acid (SA) and the development of ASA, was isolated from the bark of *Salix alba* (white willow tree). SA is a phytohormone in plants that plays a fundamental role in the regulation of physiochemical and biochemical developments throughout the lifespan of the plant. A significant amount of over-the-drugs in development have halogens present in them. The majority of halogenated drugs contain fluorine, and followed by chlorine; bromine is rare in drugs, and lastly iodine. Although ASA is non-halogenated, studies have shown that halogenated compounds show greater efficacy than their non-halogenated

counterparts. ASA, when administered to *Solanum lycopersicum* var. *cerasiforme* (Cherry Tomato), a species of tomato, has shown both positive as well as negative effects on growth and development. The synthesis and characterization of halogenated analogues of ASA will be explored and investigations carried out on their effects on the growth and development of *S. cerasiforme.* This study suggests that the position or inclusion of a halogen on ASA will affect both the physiochemical and biochemical hormonal properties of *S. cerasiforme.*

Oral Presentation #9

Isolation and Characterization of Novel *Xanthomonas fragariae* bacteriophage

A. Deulio[1], M. Miller[2], C. Holland[1], H. Wiersma-Koch[1], B. Turechek[3], and T. D'Elia[1]
[1] Indian River State College, Fort Pierce, FL.
[2]Palm Beach Atlantic University, West Palm Beach, FL.
[3]USDA-ARS, U.S. Horticultural Research Laboratory, Fort Pierce, FL.

Abstract

Bacterial angular leaf spot (ALS) is a potentially devastating disease of strawberries and is caused by the gram negative bacterium *Xanthomonas fragariae*. In order to evaluate potential control and prevention strategies, bacteriophages capable of infecting *X. fragariae* were isolated using enrichment methods. Leaves from 24 affected plants and 24 soil samples were collected from a strawberry crop which tested positive for ALS in Fort Pierce, Florida. Three isolates of *X. fragariae* collected from the same infected field were used to prepare enrichment cultures of the soil and leaves. A total of three individual plant samples and one soil sample tested positive for bacteriophages. Four unique phages from the separate samples were identified based on plaque morphology. Both the diameter and turbidity of the plaques varied for the isolated phages. Genomic DNA was isolated from each purified phage and digested with five restriction enzymes. Gel electrophoresis of the samples revealed three unique genotypes. The phage displayed a wide host range at the strain level, infecting 7 of 8 *X. fragariae* strains tested. The phages were unable to infect other species of *Xanthomonas* tested. Electron microscopy of the three distinct phage revealed similar Podoviridae morphologies consisting of isometric heads and short noncontractile tails. Biological characterization is a crucial first step in determining the potential effectiveness of phage as a biocontrol agent.

Oral Presentation #10

Stock origins of Steller sea lions in Alaska: Chiswell Island rookery

Jorge Monroy[1], Tatiana Ferrer, M.Sc. [2], and Greg O'Corry-Crowe[2], Ph.D. [2]
[1]Indian River State College, Fort Pierce, FL.[2]Harbor Branch Oceanographic Institute - Florida Atlantic University, Fort Pierce, FL.

Abstract

Stretching across the North Pacific Ocean rim from Japan to California, Steller sea lions (*Eumetopias jubatus*) breed annually and return to rookeries to raise their young (O'Corry-Crowe et al. 2006). Population structure has been investigated in Steller sea lions along the Alaskan coast, separating eastern and western rookeries into two distinct metapopulations and managed as an

Eastern and Western Stock, with the Western stock listed as endangered. Using mitochondrial DNA (mtDNA) and microsatellites, most were clearly assigned to their respective population (O'Corry-Crowe et al. 2014). Stellar sea lions are polygynous with territorial males (bulls) mating with several females, and it is presumed that there is high rookery and mate fidelity. However, current research has found the inadequacy of simple models on positive density-dependent dispersal for exploring range expansion. Recently, a potential new trend was detected: females may travel to rookeries in different metapopulations to mate with other bulls and return to their original home to give birth, or males may mate with a female from another rookery before returning home (O'Corry-Crowe et al. 2014). This study will allow a deeper look into this "new trend". Focusing on the Chiswell Islands, a rookery in the Western Stock, n=126 tissue samples were extracted and a 531 bp mtDNA fragment was sequenced and analyzed. Adding these samples will aid in completing the story of selective breeding habits among the female Steller sea lions at Chisewell Islands, and ultimately help to tease apart female breeding dispersal patterns between the eastern and western rookeries.

Oral Presentation #11

Genomic DNA extraction and detection of Helicosporidium sp. isolates in fresh water lakes

Valerie Dominguez and Denise Machado
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Abstract

Helicosporidium algae, an invertebrate pathogen detected in various mosquito hosts that is commonly found in tropical climates. *Helicosporidium*, according to Jaroslav Weiser (1970), causes lysis of host's tissues and can also act opportunistically by entering a host through an open wound. The identification of various isolates of the pathogen can assist in the reconstruction of the phylogeny and with sufficient discovery of *Helicosporidium* isolates, the algae can be used as agents for biological control. The detection of the 18S rDNA and B-tubulin genes in *Helicosporidium*, was made possible by using gene specific primers (OomCox 1Levup + Fm 85 and 69F + 1577R) on extracted DNA from local bodies of water. Samples were collected from multiple locations in the south Florida area where mosquito population can be found. After collection and filtration of water samples, the extracted DNA was amplified using polymerase chain reaction utilizing Taq Polymerase. The analyses of several amplified DNA sequences demonstrated the detection of *Helicosporidium* in bodies of water and will be analyzed further using positive controls containing the target DNA sequence.

Oral Presentation #12

Parameter estimation in fermentation processes

Maria Giraldo, and Justina L. Castellanos, Ph.D.
Miami Dade College, Miami, FL

Abstract

Fermentation is an important technique used in the treatment of waste and production of products such as antibiotics. These processes can be described using mathematical models where some parameters are unknown. Experimental data is used for the latter. Parameter estimation falls into the field of Inverse Problems that are known to be mathematically ill-posed. The research is focused in the use and testing of the robustness of an optimization method to correctly find the parameters of seventeen fermentation models. The minimization of the Nonlinear Least Squares function arising from the problem is made using a Truncated Newton's Method (TRON, J.J More). The L-curve regularizing technique previously implemented in the optimization routine, is used to deal with the ill-posedness, Numerical experiments are conducted using synthetic examples for the models, i.e., data created fixing the parameters in order to compare the solutions of the algorithm with known values. The comparisons are made by both introducing random or truncated errors to the data and then computing the parameters by both, using the L-curve and not using it. We concluded that TRON with L-curve gives better results. In a future work, we will use a global minimization method to figure out whether the sequence of local minima approximate the exact solution each time better.

Oral Presentation #13

Sleep deprivation results in increased expression of cancer-related miRNA in humans

Ezana Assefa, Xavier Tatin, Aurelien Tartar Ph.D., and Jaime L. Tartar Ph.D.
Nova Southeastern University, Fort Lauderdale, FL.

Abstract

Introduction: A growing body of evidence shows that sleep loss has profound deleterious effects on health and has been specifically linked to the development of several cancers. Despite the health cost, there is little understanding of how sleep loss increases the risk for tumor development. The purpose of this study was to identify epigenetic mechanisms through which total sleep deprivation (TSD) altered expression of known cancer-related genes. To that end, we tested the effects of TSD miRNA expression associated with tumor development. Twenty-three participants (14 males, mean age = 20) underwent actigraphy-verified TSD for 24 hours in a controlled environment. miRNA was extracted from participants' plasma and processed for cDNA synthesis. Resulting cDNA pools were used as templates in qPCR reactions to estimate differential miRNA expression. Results indicated sleep deprivation caused significant differential expression of several specific miRNA tumor-related genes, including miR-15a, miR-96, and miR-296-5p. Further tests were focused on these miRNA species on a subset of participants. Results showed that, there was a significant upregulation of miR-15a ($p < 0.05$), miR-96 ($p < 0.05$), and miR-22 ($p < 0.05$), but not miR-296-5p ($p=0.12$). Overall, these findings show how acute sleep loss can alter cancer-promoting pathways. Increased expression of miR-15a and miR-22 have known tumor suppression properties, so it is possible these exert protective effects in response to TSD. Although miR-96 is

a known oncogene, it is also part a complex clock gene pathway, with diurnal expression. Therefore, TSD potentially disrupts the diurnal expression pattern of miR-96.

Oral Presentation #14

Low Vision Patients' and Providers' Satisfaction with Telerehabilitation

Alisha Trivedi, Tony Succar, Pat Yoshinaga, Angie Bowers, John Shepherd, Nicole C. Ross, Ava K. Bittner

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Abstract

A recent systematic review found no publications with results on the topic of telerehabilitation for low vision. Our goal was to develop, execute, refine and evaluate components to deliver LV telerehabilitation services. Three LV providers conducted telerehabilitation sessions from their office with eight visually-impaired adults in their homes. Subjects recently received a hand-held magnification device for reading, and self-reported difficulty with returning for follow-up rehabilitation training at their provider's office. We obtained providers' ratings for the use of hardware devices (i.e., iPad, Android tablets, Verizon MiFi) and commercially available, HIPAA compliant, secure videoconference software (zoom.us) during telerehabilitation sessions at which subjects received training on magnifier use for reading. All subjects agreed they were comfortable receiving telerehabilitation and being evaluated via videoconferencing; half of them strongly agreed with this statement. Three-quarters of subjects reported their hand-held magnifier use improved after the telerehabilitation session. All except one subject reported they were very interested in receiving telerehabilitation services again. Providers reported little to no difficulty with evaluating subjects' reading speed, reading accuracy and working distance. Video quality was rated from excellent to good by both the providers and subjects, but audio quality was reduced for some due to poor signal strength and use of Android tablets. All except one subject had never used videoconferencing prior to our study, and three (38%) had never used the Internet. Positive feedback from the participants and providers in this pilot study supports the feasibility and potential value of LV telerehabilitation.

Oral Presentation #15

Drug screening for disruption of NMII preventing substance abuse relapse

Rebecca Stremel[1, 2,3] *Laszlo Radnai, Ph.D. [1, 2] Thomas Vaissiere, Ph.D.[1, 2]& Courtney A. Miller Ph.D.[1, 2]*

[1]Department of Molecular Medicine; [2]Department of Neuroscience, The Scripps Research Institute, Jupiter, FL., [3]Palm Beach State College, Palm Beach Gardens, FL

Abstract

The formation of strong memories are correlated with the role of F-actin and myosin II in rats and mice. Depolymerization of F-actin by Latrucilin A, an inhibitory drug, has been shown to produce an immediate and specific loss of methamphetamine (METH) associated memory independent of retrieval. However, due to actin's pivotal role in a multitude of functions in the body we turned to

non-muscle myosin II (NMII), a subclass of the myosin family which plays an important role in cell division, most importantly cytokinesis. Given that NMII differentiates amongst most muscle myosin and is sought to play a restricted role in synaptic actin polymerization, disruption shows a decline in METH associated memory. Knowing that, we are developing a drug screening assay which continuously screen compounds to identify the concentration and dosage for efficacy in inhibition of METH associated memories. Blebbistatin (blebb) has been proven to inhibit myosin II therefore, blocking cytokinesis and producing binucleated cells in the process. Here we treat cos7 cells, a specific cell line that induces neural development, in a cytokinesis assay with Blebb and derivatives measuring its effectiveness as an inhibitory drug compound. After each compound surpasses the primary screen (cytokinesis assay), it must go through an ATPase assay for additional information regarding the inhibition properties of each compound. This project underway lays way to identify a drug that complies with FDA standards to be safely administered to humans at a low enough dosage eliminating signs of toxicity especially within the cardiac myosin.

Oral Presentation #16

Uncovering the underlying mechanisms for castration resistant prostate cancer

Arthur Zahreciyan[1], Chen Lai[2], Ji-Hak Jeong, Ph.D.[2], and Jun-Li Luo, Ph.D.[2],
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[2]The Scripps Research Institute, Jupiter, Fl.

Abstract

Inflammatory chemokines fall under a group of small signaling cytokines that direct immune response cells namely macrophages for cell degradation through signal transduction. The Luo lab is dedicated to the elucidation of the underlying mechanisms for constitutively activated inflammatory signaling in castration resistant prostate cancer that is the more aggressive, androgen independent, stem-cell like form developing from primary prostate cancer. They have successfully identified the forward circuit resulting in increased nuclear factor NF-kappa-B p65 expression that promotes castration resistant prostate cancer from primary prostate cancer from suppression of serine/threonine-protein phosphatase 2b and downregulation of homeobox protein Meis2. The investigation I am partaking in analyzes whether other transport proteins play a role in CRPC formation particularly Odorant binding protein 2a (OBP2a) and Tank binding kinase 1 (TBK1). This is fulfilled through the knockdown of the respective gene through transfecting Short hairpin RNA (shRNA) that targets the desired codifying gene then examining the knockdown efficiency through western blot/immunoprecipitation, and finally inoculating the modified androgen sensitive prostate cancer cell line into mice specimens, which are then castrated. The tumor growth is measured for decreased or increased resulting size and observed for metastasis.

Oral Presentation #17

Microbiome analysis of arugula rhizospheres in plants fertilized with aqueous vermicompost solutions

Jose Calera[1], Luis Cendan[1], Carlos Vazquez[1], Rachael Karns[2], Dora Pilar Maul, Ph.D.[1], Cole Easson, Ph.D.[2], and Jose Lopez, Ph.D.[2]

[1]St. Thomas University, Miami Gardens, FL; [2]Nova Southeastern University Oceanographic Center, Dania Beach, FL

Abstract

Vermicompost-based aqueous plant fertilizers dramatically increase the number of bacteria, fungi and other microorganisms in the rhizosphere. We conducted a study in which arugula (*Eruca sativa*) plants were fertilized with four different vermicompost-based liquid solutions. In addition to vermicompost, WT1 contained unsulfured molasses; WT2 contained corn syrup; WT3 contained unsulfured molasses plus a seaweed solution. Plant growth was determined by measuring height and dry weight of the arugula plants nine weeks after fertilization treatments began. Next, we performed a microbiome analysis of the rhizosphere for each treatment. The results show that the application of vermicompost-based fertilizers positively affected both plant growth and the diversity of bacterial communities in the arugula rhizosphere. It also promoted abundance of beneficial bacterial. Abundance of certain bacterial groups was associated with treatments: in WT1 and WT3 the prevalent denitrifying bacteria family was Rhodocyclaceae, while in WT2 it was Sinobacteraceae. An understanding of the influence of fertilizers on the microbial dynamics of the rhizosphere may lead to innovative ways to promote plant growth and development.

Oral Presentation #18

Is autism caused by differences in DLGAP1 antisense 2 RNA transcript levels?

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[2]University of Miami Miller School of Medicine, Miami, FL

Abstract

Autism spectrum disorder (ASD) is associated with mutations in genes that affect the balance between neuronal excitation and inhibition. Excitatory neurotransmission in the human brain is primarily mediated by glutamatergic neurons, which express Discs large homolog-associated protein 1 (DLGAP1) post-synaptically. Differences in DLGAP1 RNA transcript levels have recently been associated with ASD. The overall goal of this project is to analyze the effect of reducing DLGAP1 non-protein coding antisense RNA transcript 2 (AS2) levels in cultured glutamatergic neurons derived from autistic and control (non-autistic) patients. We hypothesize that reducing DLGAP1 AS2 in control neurons will cause them to develop more like autistic neurons. To test this hypothesis, specific *in vitro* culturing protocols were used to grow and differentiate ASD and control human neural progenitor stem cells into glutamatergic neurons. Molecular cloning techniques were used to make a lentiviral DNA construct containing a short hairpin RNA (shRNA) designed to target DLGAP1 AS2 RNA for degradation. Immunocytochemistry data from ASD and control non-ASD cells infected with a lentivirus carrying DLGAP1 AS2 shRNA, control scrambled shRNA, or GFP are currently being analyzed.

These results will provide insight into the role of DLGAP1 AS2 in neuronal morphology and differentiation, as well as synapse development.

Oral Presentation #19

Carbonic Anhydrase is Necessary for Tracheal Filling in Drosophila

Alyssa Laffitte and James Baker, PhD.
University of Miami, Miami, FL.

Abstract

Although the respiratory system evolved independently in flies and in humans, their respiratory systems share many traits, so we believe a complete understanding of the respiratory system in flies can help us understand how fluids are cleared during respiratory system function in humans. We are studying the *Drosophila melanogaster* respiratory system, specifically, the mechanisms by which they exchange fluid to gas in their trachea. *Drosophila* embryos develop with a fluid filled trachea, but at a certain point in development, the trachea spontaneously fills with gas. A group of enzymes capable of producing a gas in animals is carbonic anhydrase. Interestingly, a gene that produces carbonic anhydrases, CAH2, is expressed in the trachea at the time fluid to gas exchange occurs. Previous work in the lab has shown that embryos that are mutant for the CAH2 gene cannot complete the fluid to gas exchange; because of this, we hypothesize that carbonic anhydrase is necessary for tracheal filling. In this study, we attempt to show that carbonic anhydrase is, in fact, necessary for fluid to gas exchange to occur. We will inject acetazolamide, a carbonic anhydrase inhibiting drug, into *Drosophila* embryos before filling and observe how it affects filling. Acetazolamide is hydrophobic and insoluble in aqueous solutions, so we will use amphipathic nanoparticles to transport the drug. This work has changed our understanding of the mechanisms underlying fluid resorption in the trachea and may apply more generally to other forms of fluid transport across epithelia in animals.

Oral Presentation #20

Mediator Effects on Mediator Doped Polymer Electrolyte

Xiaoyao Qiao
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Abstract

Electrolyte is a vital component in supercapacitors. Safety of rechargeable batteries and supercapacitors is a critical issue of commercialization of electrical power sources. It is widely accepted that the ultimate solution of this issue is use of a polymer electrolyte instead of existing liquid electrolytes. With a polymer electrolyte even in extreme environment (e.g. high temperature and pressure) or in the cases of battery failures and fire, polymer electrolyte will not release any flammable gas or liquid. However, polymer electrolytes are usually much less conducting than liquid electrolytes. Mediators are a pair of compounds which can reciprocal transform by losing and gaining electrons. Thus, doping mediators in polymer electrolyte will improve the

conductivity. Use of the mediator doped electrolytes in the electrode matrix will benefit the transport process in supercapacitors. Polyvinylidene fluoride and lithium trifluoromethanesulfonate was selected as polymer electrolyte and $K_3Fe(CN)_6$ and $K_4Fe(CN)_6$ were mediators. Another couple of mediators is I_2 and NaI. Conductivity of the membranes were measured with a device as shown in Figure 1. Results of experimental study are presented in Figures 2 and 3. Electronic conductivity of membranes is enhanced from 10^{-7}S/cm level to 10^{-4} S/cm level by increasing the concentration of mediators from 0% to 5%. In the I_2/NaI mediator doped membrane the electronic conductivity continuously increase with increasing the concentration above 5%. Ionic conductivity of membranes is stayed on 10^{-2} S/cm level. Doping mediators in polymer electrolytes significantly improves the electrical conductivity of polymer electrolytes for the applications of rechargeable batteries and supercapacitors.

2017 LSSF POSTER PRESENTATIONS

Poster #1

Nocodazole inhibits myeloid leukemia cells and cancerous hepatocytes and their stem/progenitors via multiple signal pathways.

Jocelyn Baquier [1], Henry Darrell[1], Sebastien Brumaire[1], Laura Schoonover[2], Tang Hu[1].
[1]Department of Biology, College of Arts & Sciences, [2]College of Nursing and Health Sciences, Barry University, Miami Shores, FL.

Abstract

Nocodazole is known for inhibiting microtubule polymerization. However, its specific effect on human myeloid leukemia cells and cancerous hepatocytes, especially on their progenitors is largely unknown. In this study, we investigated the effect of Nocodazole on growth of human myeloid leukemia cells (MV4-11 and TF-1a) and liver cancer cells (HEP-G2). Addition of Nocodazole at concentrations of 5μM significantly inhibited growth of MV4-11, TF-1a, and HEP-G2 cells, measured by MTT assay and Trypan blue staining. The inhibitions were dose-dependent with maximal inhibition being observed at a concentration of 10uM of Nocodazole. The cell cytology examination displayed some apoptotic-like cell death which is confirmed by detection of activated caspase 8 proteins in response to Nocodazole. The Giemsa staining exhibited that Nocodazole also induced partial differentiation in TF-1a cells, evidenced by reduced nucleus/cytoplasm ratio. We were surprised to find that the stem/progenitors of MV4-11, HEP-G2 and TF-1a cells measured by clonal culture had a high sensitivity to Nocodazole. At a concentration of 0.01uM, Nocodazole inhibited 80-90% colony-forming cells derived from the cell lines. Paralleled to the decreased cell proliferation, expression of cdc2 and cdk2 were markedly inhibited. In addition, our preliminary data suggests that the mechanisms responsible for Nocodazole action also involve the transcription factors, E2Fs. These data suggest that Nocodazole inhibits cell growth via regulating multiple signal pathways and the high sensitivity of hematopoietic stem/progenitor cells to Nocodazole makes this agent a potential drug for disrupting damaged bone marrow stem cells before receiving healthy bone marrow transplantation. Supported by NIH-NIGMS RISE Grant, R25 GM059244-16 Barry University.

Poster #2

Extreme hypoxia and apoptosis programming in zebrafish cardiomyocytes

Samantha Britz, Fabio Frech, Gabriela Hernandez,and Brenda Schoffstall Ph.D.
Department of Biology, College of Arts & Sciences,
Barry University, Miami Shores, FL.

Abstract

Human cardiomyocytes are only capable of an inadequate proliferative and regenerative response to damaged cardiac tissue. In contrast, it is known that cardiomyocytes in damaged *Danio rerio* (zebrafish) hearts are capable of complete regeneration in response to pathological injury and stress. We have developed a simple anaerobic incubation tank to induce pathological hypoxia in zebrafish hearts. After exposing fish to a severely oxygen-depleted environment for 2 hours, we found that the dissolved oxygen (DO) in fish water is reduced by an average of 81%, when compared to water exposed to normal atmospheric conditions—presumably sufficient to cause detectable cardiomyocyte damage. When cardiomyocytes are damaged by prolonged hypoxia exposure, they are typically programmed for apoptosis, and should exhibit an increase in the level of mono- and oligonucleosomes in the cytoplasm prior to actual cell death and dissolution of the cell membrane. Following re-exposure to normal oxygen levels, we dissect hearts to study specific effects on cardiac tissue. Here, we demonstrate our efforts to assess the level of cardiomyocyte damage inflicted using our hypoxia model, by testing for evidence of apoptosis programming using an ELISA assay to detect cytoplasmic histone-associated DNA fragments. With the ability to achieve detectable cardiomyocyte damage using our hypoxia model, we can conduct future investigations of cardiac regeneration and cardiomyocyte proliferation in zebrafish. These findings may be translatable into discovery of molecular targets for therapies to stimulate human cardiomyocyte regeneration and repair. Support: NIH-NIGMS RISE Award, R25 GM059244-16, Barry University and the 2016 ASCB MAC Linkage Fellowship, B. Schoffstall.

Poster #3

Unmanned Aerial Vehicle-based Automobile License Plate Recognition System for Institutional Parking Lots

Julian Dasilva, Roland Schiller, Sanja Zivanovic Ph.D., and Ricardo Jimenez Ph.D.
Department of Mathematics and Computer Science, College of Arts & Sciences,
Barry University, Miami Shores, FL.

Abstract

Technology continues to grow at an exponential pace. Vehicle automation (both land and aerial) is now a reality, as unpiloted aircraft technology has shrunk down to a civilian level, and artificial intelligence is making leaps and bounds in multiple disciplines. Drones have many purposes, and they are a current trend across many industries. They can be used for delivery, sports, surveillance, professional photography, cinematography, military combat, natural disaster assistance, security, and the list grows exponentially every day. Programming opens an avenue to automate many processes of daily life and with the drone as aerial programmable eyes, security can become more efficient and cost effective. At Barry University, parking is becoming an issue as the number of

people visiting the school greatly outnumbers the available parking locations. This has caused a multitude of hazards in parking lots due to people illegally parking, as well as unregistered vehicles parking in reserved areas. Drone surveillance is utilized to detect unauthorized parking at Barry University. The surveillance process is completed in three steps: collecting visual data, processing data automatically, and sending automated responses and ques to the operator of the system. Essentially, an app is being created, so that with a click of a button, the drone will be able to survey a chosen parking lot and to return license plates of cars that are illegally parked.

Poster #4

Alternative ways of proving several differentiation rules from Calculus

Ricardo Gomez and Lubomir Markov, Ph.D.
Barry University, Miami Shores, Fl.

Abstract

In a recent note from the *American Mathematical Monthly,* it is demonstrated how one may prove the Product Rule for differentiation without the standard technique of adding and subtracting certain quantities, which is often counterintuitive to the student. We develop this idea further. First, two rules are proved from the definition of a derivative and from the rules for differentiation of sums and differences. Then we show that these rules suffice to prove the Product Rule and the Quotient Rule, and indeed the fact that they are equivalent. Furthermore we show that if one begins with the derivative of the tangent function (proved from the definition), then one easily obtains the derivatives of the remaining five trigonometric functions, unlike the usual approach via sines and cosines. The main advantage of developing the theory this way is the fact that one does not use the general Chain Rule, the proper justification of which is the most difficult of all proofs of the rules for differentiation.

Poster #5

Multimedia Campus Locator

Jose Gomez, Alfonso Logrono, Oliver Bautista, and James Haralambides, Ph.D.
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Barry University, Miami Shores, FL.

Abstract

The problem of allocated resources effectively at a complex organization such as a university is very challenging. Identifying specialized personnel and obtaining reliable information is particularly important for prospective students and their families for purposes of navigation, selection, admission, and registration. We are designing an application that allows students and visitors to locate offices, departments, buildings, and personnel on a university campus through a keyword-based search. Each keyword is associated with a list of appropriate synonyms and relevant expressions for increased flexibility. Keywords such as “financial aid” or “health services” are classified alphabetically as well as with respect to the group entity they characterize (building, office, department, etc.). User selection is followed by the activation of a window that displays pertinent information such as offices, individuals, and services provided at that location.

A multimedia window will display the location of the building as a highlighted segment on an interactive campus map. As the user hovers over the selection, a tooltip presents a summarized version of the services provided in the building. The user has the option to display an individual location on the map or a set of locations that satisfy search properties. If the highlighted region is selected, a pop-up window will provide a list of images for the building as well as a 360 degree animation of the surrounding areas. This increases the degree of familiarity of the campus for users of the system and reduces overhead as services are located faster and more accurately.

Poster #6

Roles of a Dynamin-related protein and interacting proteins in plant development

Gabriela Hernandez, Gayani Ekanayake, John M. Smith, Antje Heese
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Barry University, Miami Shores, FL.

Abstract

Studying how plants defend themselves against pathogens is highly important because many plants can be damaged by bacterial infections, which in turn can cause a decrease in crop production and biomass. Vesicular trafficking is the movement of cargo proteins from one organelle to another in the form of small membrane-bound vesicles. Our lab is interested in understanding the role of vesicular trafficking proteins in plant immunity and plant growth and development. We have recently shown that the vesicular trafficking protein Dynamin-Related Protein 2B (DRP2B) acts as molecular scissors during ligand-induced endocytosis of plant immune receptor Flagellin Sensing 2 (FLS2). In addition, DRP2B functions as a regulator for immune signaling and immunity against the virulent *Pseudomanas* bacteria. In a large scale co-immunoprecipitation assay, we have identified several vesicular trafficking proteins interacting with DRP2B including Vesicular Trafficking Protein 3 (VES3). We aimed to determine whether DRP2B and VES3 have roles in plant growth and development. Polymerase chain reaction (PCR) and cleaved amplified polymorphic sequences (CAPS) analysis were used to confirm that each *drp2b-2* and *ves3-1* are homozygous mutants. To check whether *drp2b-2* and *ves3-1* single mutants have potential developmental and growth defects, roots were grown and aerial tissues of the single mutants were weighed, and compared to wild-type Col-0. The *ves3* mutants were smaller in weight and had shorter roots compared to the wildtype Col-0 and *drp2b* mutant. In the long term, understanding how these vesicular trafficking proteins contribute to plant growth and development may help to improve biomass production. Supported by: RISE: NIH-NIGMS RISE Grant, R25 GM059244-16, Barry University and Cell Biology Summer fellowship from the University of Missouri-Columbia.

Poster #7

Loss of estrogen receptor alpha causes metabolic and endothelial dysfunction in male mice

Gabriela S. Lin[1], Thomas J. Jurrissen[2], Michelle L. Gastecki[2], Rebecca J. Welly[2], Nathan C. Winn[2], Dennis B. Lubahn[2], Victoria J. Vieira-Potter[2], Jaume Padilla[2]

[1]Barry University and [2]University of Missouri-Columbia

Abstract

It is well established that estrogen signaling through estrogen receptor alpha (ERα) plays a protective role against metabolic and cardiovascular dysfunction in females, however, less is known about the putative role of ERα in males. Consequently, we investigated whether it plays a similar role in metabolism and cardiac function in male mice. Sixteen month-old C57BL/6J wild type (WT; n=6) and mutated/non-functional ERα (knockout, KO; n=7) male mice underwent metabolic tests for glucose and insulin tolerance, body composition analysis, as well as aortic stiffness tests (in vivo and ex vivo), and ex vivo aortic vasomotor function tests. ERα KO mice exhibited impaired glucose and insulin tolerance compared to the WT. Despite no significant differences in body mass, KO mice displayed increased body fat percentage (KO: 24.8±2.83% vs. WT: 16.8±0.46%; $p<0.05$) and decreased lean mass (KO: 70.4±2.63% vs. WT: 78.1±0.41%; $p<0.05$) compared to WT. In addition, acetylcholine-induced vasorelaxation, an index of endothelial function, was blunted in ERα KO compared to WT mice (maximal relaxation KO: 27.3±5.9% vs. WT: 57.8±5.1%, $p<0.05$), whereas no differences between groups was noted in sodium nitroprusside-induced relaxation ($p>0.05$) and measures of aortic stiffness ($p>0.05$). Collectively, these findings demonstrate that disruption of ERα causes metabolic and cardiac dysfunction in males, thus supporting the notion that estrogen signaling through ERα is critical for maintenance of cardiometabolic health in both males and females. Support: NIH-NIGMS RISE Award, R25 GM059244-16, Barry University and the 2016 ASCB MAC Linkage Fellowship, B. Schoffstall.

Poster #8

An ex-vivo tissue explant zebrafish model for the study of biofilm formation and eradication

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Department of Biology, College of Arts & Sciences,

Barry University, Miami Shores, FL.

Abstract

Biofilm is an accumulation of multi-species and multicellular microbial mass embedded in polysaccharide matrix with adhesive abilities. Complex biofilm has remarkable ability to impede normal immune responses and aggressive medical interventions, leading to difficulties in treating infections of wounds, heart valves, and bone tissue. We must utilize in vitro, in vivo, and ex vivo models to gain understanding of biofilm formation and eradication. We have previously established that the RP62A (WT) *Staphylococcus epidermidis* strain was able to form robust biofilm, compared to 1457(WT), which formed smaller biofilm mass, and mutant 1457 aapΔ/icaΔ, which was unable to form biofilm. We previously established a wound model using Danio rerio (zebrafish), both in in vivo setting and ex-vivo tissue explant culture, within which formation,

growth, and treatment of biofilm can be analyzed. After inflicting penetrating burn injuries to zebrafish, wounds were inoculated with RP62A (WT), 1457 (WT), or 1457 aapΔ/icaΔ strains of *S. epidermidis*. We photographically documented the process of biofilm formation in inoculated wounds within zebrafish explant cultures. We found evidence of bacterial growth in all three strains; however, only the RP62A strain formed robust, macroscopic biofilm. All Gram stains demonstrated presence of classic staphylococcal bacteria and Gram negative rods, which are representative of endogenous or environmental bacteria. Gram stain of RP62A biofilm exhibited evidence of cluster formation held together with polysaccharide matrix. Future studies will focus on investigating chemical or pharmaceutical means to disrupt biofilm formation in zebrafish in vivo and in ex-vivo tissue explant culture. Support: NIH-NIGMS RISE Award, R25 GM059244-16, Barry University.

Poster #9

A Mobile Degree Audit System

Roland Schiller, Julian Dasilva, and James Haralambides, PhD
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Barry University, Miami Shores, FL.

Abstract

We are creating an automated degree audit system for mobile devices. Currently, degree audit forms must be filled out manually by advisors whose tasks include evaluating university catalogs, general education requirements, co-requisite requirements, and requirements set in the major and minor disciplines. The system is rule-based; it has online access to a student's transcript as well as all applicable master lists of courses that fulfill degree requirements in each of the appropriate categories. The application prototype is developed for the Computer Science Major (CS) with a dedicated Mathematics Minor. Courses are classified in the following categories: General Education, CS core courses, CS electives, Math courses in the minor, co-requisites, and general electives. Degree requirements for all of the above categories are incorporated in the system and are organized chronologically according to the catalog year in which they apply. The application allows students that use their mobile devices to logon with their university credentials and obtain an electronic as well as printed copy of their unofficial degree audit document. A list of courses that fulfill all remaining requirements is optionally provided to assist students and advisors during the next registration period. In cases of courses taken that do not fall in any of the predefined categories, a list of recommendations for substitution and subsequent advisor approval is offered by the system. The system can be utilized equally by students, advisors, and administrators by setting appropriate access privileges. The application will be updated at regular intervals to accommodate changes in degree requirements.

Poster #10

Accent perceived discrimination and intention to quit among college students: The moderating role of hardiness

Cynthia Socarras, Guillermo Wated, Ph.D., and Sabrina Des Rosiers, Ph.D.
Barry University, Miami Shores, FL

Abstract

In 2008, the Viacom Media Network and associated press conducted a survey and found that 80% of college students say they frequently or sometimes experience daily stress (Schuder, 2014). Stressors are physical, psychological, or social forces that put demands on all internal and external aspects of an individual (Hopper, 2014). Individuals stigmatized by accent are likely to be exposed to risk factors such as perceived discrimination and stressful social environments, which can increase their vulnerability to the effects of stress (Allison, 1998; Meyer, 2003; Williams et al., 1994). Over the past few years, hardiness has emerged as a buffer in the relationship between stressors and different outcomes particularly in the academic environment (Maddi, 2006). Hardiness is a personality trait commonly defined as a collection of personality characteristics that help individuals cope with stressful life events (Kobasa, 1982). The purpose of the present study was to evaluate the moderating role of hardiness between discrimination based on accent and intention to quit in college students. Participants were 65 (77% women and 23% men) emerging adults enrolled in universities across the country with ages ranging from 18 - 29 (M = 21.42, SD = 2.57). Results indicated that hardiness did not moderate the relationship between accent perceived discrimination and intention to quit. However, there was a significant relationship between accent perceived discrimination and intention to quit (r = .42, p < .001). These findings have important implications for improving student's retention.

Poster #11

Effects of age on circadian rhythms in the jumping spider *Menemerus bivittatus*

William J. Grossman and Thaddeus R. McRae, Ph.D.
Broward College, Pembroke Pines, FL.

Abstract

Menemerus bivittatus, the gray wall jumper, is a pantropical jumping spider that hunts by sight during daylight hours. Juveniles and adults live almost exclusively on the walls of buildings, and prey on small flies, moths, and other insects, occasionally eating spiders of other species. Maximum prey size is limited by body size of the spider, so adults can access a wide range of prey items while small juveniles are limited to the smaller prey items. This could result in a need for juveniles to spend more time actively hunting than adults spend. On the other hand, adult spiders have additional metabolic costs associated with reproduction. Females must secure enough food to produce eggs, and males spend time actively searching for and courting females--an energetic activity. Thus, it is an open question whether adults or juveniles would be expected to differ in activity levels throughout the day. Using wild-caught spiders we recorded activity in five-minute intervals over five days. To test for effects of age on circadian cycles of activity, we are comparing mean time spent active, duration of active periods, and timing of peak activity between adult and juvenile spiders. Spiders used range in age from young juveniles that had recently left their

mother's shelter to adults of reproductive age. Preliminary results suggests that juveniles may spend more time active than adults. We will present our final results and conclusions after finishing data collection and analysis.

Poster #12

Expression and Optimization of Recombinant Human Galectin-1 for Binding Studies as a Potential Target for Cancer Therapy

Camelia Garcia, Maria C. Rodriguez, Ph.D., Yaima Rivero, Forrest Fitzgerald, and Mare Cudic, Ph.D., Florida Atlantic University, Miami, FL.

Abstract

Galectin-1 (gal-1), a β-galactoside binding protein, has become an important subject of research because of its overexpression by cancer cells and involvement in tumor promoting activities. Such activities are a consequence of a carbohydrate recognition domain (CRD) becoming functional by forming a homo-dimer through non-covalent bonding, thus leaving gal-1 fully accessible for cross-linking with multiple *N*- and *O*-glycoprotein ligands on the surface of cancer cells. However, the exact mechanisms are still poorly understood and need to be further evaluated at the molecular level. Since these binding studies require relatively large quantities of gal-1, we have developed and optimized a protocol for large-scale expression and purification of human gal-1 for use in upcoming binding studies. Our project has focused on expression and purification of gal-1 in order to explore its ligand binding properties and subsequently develop potential inhibitors. The human gal-1 cDNA (LSGAL1) gene segment was amplified using PCR and cloned into a label-free plasmid vector. The protein was expressed recombinantly in *E. coli*, and purified *via* α-lactose-agarose affinity chromatography, verified using gel electrophoresis, and concentrations determined by absorbance readings. Our future goals are to utilize the recombinant gal-1 in label-free binding studies, such as isothermal titration calorimetry (ITC), to further explore the ligand binding properties of the CRD which is essential in order to advance gal-1 CRD specific inhibitors as a cancer therapy.

Poster #13

How did I get here? Selective activation of head direction cells

Jonathan M. Rivera, Joan C. Lora, MSc., Robert W. Stackman Jr., Ph.D.
Florida Atlantic University, Boca Raton, FL

Abstract

The ability to navigate from place to place is compromised in individuals with cognitive impairments such as Alzheimer's disease. Head direction cells (HDC) provide a sense of direction within respective environments and are implicated in goal-directed navigation. Current methods of identifying HDC are limited to *in vivo* electrophysiological recordings in rodent models. Each HDC is tuned to a distinct head orientation, on the x-plane irrespective of body position, and fires maximally when the animal's head is pointing in the preferred firing direction. In order to learn about HDC function, we quantified expression of neuronal activation marker (c-Fos), and L-amino transporter (Lat4) in neurons found within HDC dense anterodorsal thalamic nucleus (ADN). We hypothesize that access to more head directions will lead to an increase in c-Fos expression. Additionally, we hypothesize that these two proteins are colocalized within ADN neurons

following varying amounts of head direction exposure. Results indicate that mice with access to 360° in an open field arena express significantly higher amounts of c-Fos within the ADN when compared to those with reduced access to head directions in clear or opaque treadmills. These findings indicate increased activation of cells within ADN when more head directions are explored. We observed a high degree of colocalization of c-Fos and Lat4 within ADN neurons allowing us to use Lat4 as a tool to manipulate neuronal activity. Identifying genetic markers specific to ADN helps provide an essential understanding of the spatial navigation system, and supports development of therapies for cognitive disorders affecting navigation.

Poster #14

Diet and temporal partitioning by the common octopus and the Atlantic longarm octopus in a South Florida habitat

Danielle Bartz[1,2], Chelsea Bennice[2], William Brooks[2]
[1]Honors Thesis Program, [2]Department of Biological Sciences, FAU

Abstract

Niche partitioning is used by sympatric species to reduce competition within the ecosystem. Sympatric species are species that spatially overlap, meaning they live in the same area. In this study, we are examining two dimensions of niche partitioning (diet and temporal) amongst the common octopus (*Octopus vulgaris*) and the Atlantic longarm octopus (*Macrotritopus defilippi*), which spatially overlap in a shallow South Florida Intracoastal habitat. We hypothesize that the two species are utilizing diet and/or temporal partitioning to facilitate coexistence. To determine the diet for each species, we collected and identified newly discarded prey remains from the octopuses' dens. In concert with sample collection, we used supplemental video and images to identify prey. A 24h octopus monitoring camera was used to determine octopus foraging activity. Our preliminary results demonstrate that the common octopus is eating bivalves (55%), gastropods (32%) and crustaceans (13%), and foraging during crepuscular and nocturnal hours. The Atlantic longarm octopus is eating crustaceans (90%) and bivalves (10%), and foraging during diurnal hours. These preliminary results suggest that the two species exhibit diet overlap and use temporal partitioning as a means of coexistence. Further data collection and analysis are required to solidify the findings of our preliminary results. This is the first study to examine the niche partitioning mechanisms used by these two species at this location. This study will provide additional findings to cephalopod niche partitioning literature and novel information on the ecology of the Atlantic longarm octopus.

Poster #15

Cytotoxicity studies of marine natural products in different prostate cancer cell lines

Joubin Jebelli, Paul Scesca, William Trevino, Bryan Fleurantin, James Kumi-Diaka, Lyndon West

Florida Atlantic University, Boca Raton, Fl.

Abstract

Prostate cancer is the second most common form of cancer and the third leading cause of cancer death in American men. An estimated 161,360 new cases of prostate cancer and an approximated 26,730 deaths are expected to occur in 2017. The chemical and biological diversity of marine habitats are innumerable. They can be utilized as candidates for development of drugs for the treatment of prostate cancer. In early preliminary studies, effects of several different marine secondary metabolites were investigated on prostate cancer cell lines. The compounds were extracted and purified using a series of reverse phase chromatographic separations. Currently, we are investigating the cytotoxic effects of our secondary metabolites on the DU-145 and LNCaP prostate cancer cell lines. In this preliminary study, the following bioassays will be used to assess the impact of the metabolites of interest, on the carcinogenesis of the selected cancer cells: Trypan blue exclusion assay; MTT; NBT (nitro-blue tetrazolium); and fluorescent microscopy to assess the mode of treatment-induced cell death. The results/data generated from the study will lay the platform for further in-depth studies on potential therapeutic application of these metabolites, in the fight against prostate cancer.

Poster #16

Protein replacement therapy to treat neuronal structural defects caused by mutation of the autism risk gene *Pten*

Vanessa Walters, Dr. Ori Cohen, and Damon Page, Ph.D.

Florida Atlantic University, Jupiter, FL

Abstract

Mutations in *PTEN* cause macrocephaly/autism syndrome, which is defined by overgrowth of the head and brain (macrocephaly and megalencephaly, respectively) and autism spectrum disorder (ASD). *PTEN* encodes a phosphatase that is regulator of the PI3K-AKT-mTOR signaling pathway, which is crucial for cell growth and proliferation. The aim of this study is to restore Pten levels using a novel protein replacement strategy and evaluating the effects on cellular proliferation and morphology. We utilize a well-established mouse model of macrocephaly/autism syndrome (*Pten* haploinsufficient mice) to generate cultures of primary neurons which display structural defects (e.g. neurite overgrowth) as compared to neurons derived from wild type animals. We hypothesize that restoration of Pten levels in neurons derived from *Pten* haploinsufficient mice will restore normal functioning of the PI3K-AKT-mTOR signaling pathway, which in turn will reverse the morphological abnormalities seen in these cells.

Poster #17

Production of biologically active molecules using an organometallic catalyst

Nicholas Lauta, Ryan Williams, and Daniel Paull, Ph.D.
Florida Gulf Coast University, Fort Myers, Fl.

Abstract

The intent of this project is to design a new organometallic catalyst that can be used to produce biological molecules of interest using di-substituted ketenes. The catalyst being synthesized is palladium based and is green because it is easily recoverable. Di-substituted ketene reactions are very difficult to control with selectivity and therefore are not commonly used to produce bioactive targets, while their mono-substituted counterparts are pervasive in this regard. This catalyst has demonstrated the ability to effectively catalyze reactions using di-substituted ketenes with enantioselectivity. One target class that this catalyst has shown promise in synthesizing are beta-lactams, which form the core structure of penicillin and all similar antibiotics. Initial testing of the catalyst has shown promise to provide an easy and efficient method for selectively synthesizing penicillin analogues. Our beta-lactams products will be given to our collaborators in the biological sciences at FGCU to be tested for the extent and specificity of their antibiotic character. With bacteria rapidly becoming resistant to antibiotics, improved and more diverse combatants are constantly required. Another area of study for this catalyst is the recyclability, which shows promising results. This catalyst also has the potential for numerous other uses that are currently being investigated and will be discussed along with disclosure of our synthesis of this unique catalyst.

Poster #18

The Effect of Novel Ionic Liquids on the Enzyme Catalysis of Histidase

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Advisors: John T. Reilly, Ph.D. and Arsalan Mirjafari, Ph.D.

Abstract

Histidase, an enzyme found in skin, reacts with histidine to form trans-urocanic acid. Ionic liquids (ILs) are an intriguing class of tunable, environmentally-friendly solvents whose physiochemical properties make them important media for the stabilization and activation of enzymes. The ILs used in this study can be classified as Protic, Aprotic and novel Protic-Aprotic. Protic Ionic Liquids (PILs) possess a positively-charged Hydrogen available for donation while Aprotic Ionic Liquids (AILs) do not. The novel Protic-Aprotic liquids, or Bridged Ionic Liquids (BILs), possess the two distinct extremes. This project aims to investigate the effect of PILs, BILs and AILs on the enzyme catalysis of Histidase. Using an ultraviolet-visible spectrophotometer (Model Shimadzu UV 2450) with a temperature-controlled cell holder (Model TCC240) the formation of the characteristic trans-urocanic acid peak at 277 nm was measured. V_{max} and K_m were determined through non-linear regression (Dynafit) of the Michaelis-Menten plot, and type of inhibition was determined using linear regression of a Dixon plot. Triplicate runs of five different concentrations of histidine with three different concentrations of each IL were used. At present, one BIL produced little effect

on catalytic activity whereas the other four BILs exhibited an increase in inhibition with one BIL greatly decreasing catalytic activity. All PILs inhibited enzyme activity to different degrees. AILs continue to be investigated. The K_m and V_{max} of all the inhibitors were compared to a "baseline" which did not include any IL.

Poster #19

Utilizing a novel catalyst in the production of biologically active molecules

Ryan Williams, Nicholas Lauta, and Daniel Paull, Ph.D.
Florida Gulf Coast University, Fort Myers, Fl.

Abstract

This research project aims to design and synthesize a novel organometallic catalyst that can be used in reactions that utilize di-substituted ketenes as substrates. Many reactions utilize mono-substituted ketenes, which are more unstable and therefore reactive, however, this limits the scope of the products that can be formed from these reactions. Di-substituted ketenes are more stable, less reactive, and using them will greatly increase the range of products we can synthesize; currently, there are no facile methods of using di-substituted ketenes in reactions to form the important biological molecules we aim to produce. This catalyst is designed to make the di-substituted ketenes react selectively with the other reactants in solution. The point of making this catalyst is so that ketenes can be a feasible reactant to use for the synthesis of novel biologically active molecules. A primary example of our biologically active target molecules includes beta-lactams, which are important precursors for antibiotics, potential anti-cancer drugs, and beta-amino acids. I aim to design the most efficient synthesis of this catalyst with minimal steps, and to generate high yields with minimal byproducts, which are environmentally harmful. We have designed and synthesized the catalyst and identified it using various spectroscopic methods, and we are close to fully optimizing the synthetic method. Preliminary testing has demonstrated our catalyst's ability to efficiently synthesize bioactive molecules in ways we had predicted through selective reactions with various test substrates. More extensive testing needs to be done, but early testing shows great results.

Poster #20

Rotavirus Entry into Polarized Columnar Madin-Darby Canine Kidney Cells

Brian Garcia, Eric Salgado, Stephen Harrison
Florida International University, Miami, FL; Department of Molecular Medicine, Boston Children's Hospital, Harvard Medical School, Boston, MA

Abstract

The Rotaviruses are non-enveloped, double stranded RNA viruses composed of an inner, double-layered particle (DLP) made of viral proteins VP2 and VP6, which enclose the viral RNA, polymerase, and capping protein, and an outer coat of VP7 that surrounds the DLP and anchors VP4 spikes onto the virus particle. Together all of these components are referred as the triple-layered particle (TLP). Viral entry begins when VP4 spikes interact with host cell glycolipids to direct engulfment of the virus into a cellular vesicle. VP7 then dissociates from the DLP and frees VP4 allowing it to undergo conformational changes that ultimately perforate the membrane.

Previous studies have followed rotavirus entry into cells using spinning disc confocal microscopy. The limitations of this particular microscopy system have restricted imaging to relatively flat and morphologically simple cells. However, the enterocytes that are infected by rotavirus are polarized columnar cells with distinct structural features at their basolateral and apical surfaces. To overcome this limitation we have used lattice-light sheet microscopy to acquire high frequency, 3-D, live-cell movies of viral entry in Madin-Darby Canine Kidney (MDCK) cells, which become polarized when grown on glass coverslips. The MDCK line of interest has been transfected to stably express AP2-GFP fusion protein that forms fluorescent puncta at clathrin-coated pits. Using these MDCK cells we intend to corroborate on previous observations that rotavirus entry is independent of clathrin-mediated endocytosis, characterize the path of viral entry, and examine entry kinetics in the cell type to compare with data obtained in previous experiments using non-polarized cells. This material is based on work supported by the Howard Hughes Medical Institute and facilitated through their undergraduate summer research program, Exceptional Research Opportunities Program (EXROP).

Poster #21

Validation of StockMarks® for Dogs Genotyping Kit for canine DNA profiling in forensics

Gretel Arcia Gonzalez, Dr. DeEtta Mills
Department of Biological Sciences, Florida International University, Miami, FL

Abstract

Given that pet dogs live in close proximity to their owners, it is not uncommon to find canine DNA at crime scenes. As forensic technology advances, new non-human DNA profiling kits have been developed. The purpose of this research study was to assess the reliability and robustness of the StockMarks® for Dogs Genotyping Kit (Applied Biosystems, Foster City. CA) in the amplification of microsatellite markers recommended by the American Kennel Club. Buccal swabs were obtained from ten dogs, some of which were related. Several tests were performed to evaluate the STR multiplex, such as sensitivity testing, reproducibility studies, and mixture analysis. Current limitations of the kit include the lack of a sex-determining marker, which was added as part of this research project. All canines were successfully profiled with 1.0 ng of extracted DNA using the StockMarks® kit, and known familial relationships were confirmed. The lowest amount of DNA the multiplex could successfully type was 0.05 ng. The reproducibility study showed that consistent and reliable profiles were generated for all DNA samples. For the mixture analysis, the lowest ratio that robustly amplified the minor component was the 1:5 ratio. Amelogenin based determination of gender was successful. Future research includes a performance assessment of Maxwell Robotic Extraction Instrument and the StockMarks® Kit in the extraction and amplification of DNA from canine fecal samples. An in-house kit for use at FIU International Forensic Research Institute using the reliable markers from the StockMarks Multiplex and the added Amelogenin sex marker will be developed.

Poster #22

A Comparative Analysis of Organic and Inorganic Carbon Content in *Halimeda* and *Penicillus* (Chlorophyta Bryopsidales) in a Subtropical Coastal Lagoon.

Danielle Hatt and Ligia Collado-Vides, Ph.D.,
Department of Biological Sciences, Florida International University, Miami, FL.

Abstract

Florida Bay is a coastal tropical lagoon dominated by calcareous sediments that support healthy seagrass ecosystems. Species of the genera *Halimeda* spp. and *Penicillus* spp. are the two most abundant green algae found in Florida Bay that contribute to the production of sand. Three sites, Sprigger Bank, Bob Allan and Duck Key, within Florida Bay were surveyed four times a year to include seasonal variation from 2007 to 2015. The algae collected from randomly placed quadrats were cleaned, dry weighed and incinerated. The ashes obtained are reported as a proxy of inorganic carbon, and organic carbon is reported as the total dry weight minus the ashes. Interspecific differences of organic carbon and inorganic carbon were compared at Sprigger Bank, the only site with presence of both genera. Spatial differences were conducted using the genus *Penicillus,* which is found across all sampled sites. Interspecific comparison demonstrates that higher total mass and higher content of inorganic carbon is present in *Halimeda* than in *Penicillus*. Total mass, inorganic and organic carbon of *Penicillus* was dependent on site, with the highest values present at Sprigger Bank. These results are used to develop the working hypothesis that variables such as salinity, temperature and nutrients might be affecting the presence and abundance of the different species across Florida Bay. It is expected that changes in water flow and quality proposed by the Coastal Everglades Restoration Program could have an impact in the sand production in the bay if those changes result in a differential species distribution.

Poster #23

Baseline Adhesion Testing of Intumescent Coatings

Alexander Piedra, Jesse Viera, and Joseph Sinicrope
Florida International University, Miami, FL.

Abstract

ASTM procedures are conducted on intumescent coatings to assess their adhesive strength. Tape Test 3359 and Pull-Off Test D4541 are applied on two unique coatings. Testing is conducted both before and after heat subjection while a muffle furnace is used to expose samples to various high temperatures. Coatings are applied in both ideal and non-ideal conditions to account for environmental factors. A wet film thickness gauge is used to ensure consistent application of the coating on the substrate. The selected substrate material of steel represents the application environment of interest. Results regarding environmental factors show a potentially higher importance over heat resistance capabilities. Adhesion results and several significant factors of the experiment are discussed and a subjectively stronger candidate is chosen for further analysis.

Poster #24

Investigating the effect of sorbed humic acid on the mobility of uranium

Ripley Raubenolt (DOE Fellow), Ravi Gudavalli Ph.D. (Mentor)
Florida International University, Miami, Fl.

Abstract

The F-Area seepage basins at Savannah River Site (SRS) has received approximately 1.8 billion gallons of low-level waste solutions containing nitric acid, radionuclides, and dissolved metals due to plutonium separation operations. The waste solutions became a source of contamination for groundwater and soil at the site, with U(VI) and other radionuclides above their maximum contaminant levels (MCL). The use of humic acid (HA) as a remediation technology has shown to be a potential approach for controlling mobility of radionuclides. HA has a strong sorption capacity and develops a strong bond at slight acidic pH with uranium, thus limiting uranium's mobility by flushing SRS groundwater. Column experiments were conducted using SRS soil from the F/H Area to examine the sorption and desorption properties of HA and uranium in SRS soil. Approximately 80% of uranium was immobilized due to interaction with 670 mg/kg of HA sorbed on the soil.

Poster #25

Role of Ionic Strength on Sorption of Neodymium on Dolomite

Frances Zengotita and Dr. Hilary Emerson Ph.D.
Florida International University, Miami, Fl.

Abstract

The Waste Isolation Pilot Plant (WIPP) is a deep geologic repository for permanent disposal of radioactive waste from the nation's nuclear defense program. In the most likely WIPP Release scenario, human intrusion (cuttings, cavings, spallings) can lead to direct and/or long-term brine release with the most transmissive layer in the Rustler formation above the repository. The chemical behavior of actinide series elements (the most long-lived byproduct of the waste created from development of nuclear weapons) is a major concern for the WIPP due to their long half-lives and unknown mobility in the WIPP environment. In this work, we are investigating the sorption processes of neodymium on the dolomite mineral through batch and column experiments. Neodymium is used as a nonradioactive, chemical analogue to Am and Pu(III). The results for these experiments are still being collected and analyzed, but preliminary batch data show that the sorption of Nd appears to increase slightly with increasing ionic strength. Specifically, ionic strength appears to begin affecting sorption between 1.0 and 5.0 M. We are still investigating the mechanisms leading to increased sorption with ionic strength.

Poster #26

The affect runoff has on the water quality in an urban pond

*Jessica Jackson, **Patria Henry**, Janique Miller and Malayjia Parrish*
Florida Memorial University, Miami Gardens, Fl

Abstract

Florida Memorial University has an urban pond positioned at the entrance of the campus. There has been no previous research done on the man-made pond so its quality and contents is somewhat of a mystery. There are five pipes that run into the pond carrying runoff from the rainfall and many organisms that inhabit the aquatic ecosystem provided. If water samples from the urban pond are tested for water quality parameters after rainfall the pH, water hardness, and temperature will decrease whereas nitrate, phosphate, dissolved oxygen, conductivity, carbon dioxide, and turbidity levels will increase. The study is important because the water quality directly affects species diversity and life. The experiment began with labeling each testing site in the urban pond A-F. The control of this experiment was the designated area without the runoff pipes within the urban lagoon. Data was collected Monday-Thursday around 1pm. At each testing site the parameters tested was dissolved oxygen, pH, temperature, phosphate, nitrate, turbidity, conductivity, carbon dioxide, water hardness, light intensity and the water level. If it rained on any of the days while collecting water the water from the runoff pipes was collected. After the samples of water were collected from each site, it was taken back into the lab for further testing. Being that the days were divided, at times, each sites show phosphate, nitrate, and some days there were none. Also, the lagoon was treated which also threw off data readings in some sites.

Poster #27

Cardiac Fibroblasts Functionality under the Influence of TH2 cytokines

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Johns Hopkins University, Baltimore, MD; Florida Memorial University, Miami Gardens, FL

Abstract

Recent studies have found that the cytokine IL-33 activates Th2 response via Innate Lymphoid Cells (ILCs). IL-33 also induces eosinophilic pericarditis and is involved in the pathology of autoimmune myocarditis. Furthermore, exogenous IL-33 induces its endogenous production by cardiac fibroblast (CFs). However, CFs do not have ST2, which is the surface receptor for IL-33. This project aimed to investigate the role of CFs and innate lymphoid cells in a pro-inflammatory loop involved in pericarditis and myocarditis. In this loop we hypothesize: CF-derived IL-33 activates ILC type 2, resulting in the release of cytokines that can further activate CFs; in turn creating a pro-inflammatory cycle. Sca1+ CFs were FACS sorted from mice hearts (WT Balb/c) and cultured in vitro for 6 days with focal ILC type 2-derived cytokines: IL5, IL9 and IL13. The readout of IL33 production was determined by ELISA, and the phenotype of CFs were analyzed through flow cytometry. A constitutive expression of IL33 by Sca1 CFs (27.55±1.35 pg/mL) was found. The production of IL-33 was not enhanced by IL5, IL9 or IL13 (29.30±1.20; 28.25±1.65; 33.2±2.90 pg/mL, respectively). The project showed that IL-5, IL-9 and IL-13 were not the direct source of the release of IL-33 by CFs. As consequence, further investigation is required to

determine if other ILC2-derived cytokines can stimulate CFs, or another cell, like mast cells, can mediate the ILC-CFs cross-talk.

Poster #28

The effect of sub-chronic of 6-hydroxydopamine on mitochondrial quality control

Neugenia Joseph, Ms. Iru Paudel, Dr. Jeremy Chambers
Florida International University, Miami, Fl.
Attend: Florida Memorial University

Abstract

PINK1 protein protects cells from stress-induced mitochondrial dysfunction and causes the Parkin protein to bind to depolarized mitochondria to induce autophagy. Recent data from the Chambers' lab at Florida International University shows that Sab interacts with mitochondrial quality control proteins, such as JNK and PINK1, and is necessary for fission. Mitochondrial fission and fusion play prominent roles in disease-related processes such as apoptosis and mitophagy. Inhibition of the JNK-Sab interaction has shown to protect rats from Parkinson-like neurodegeneration, and JNK signaling and Sab levels are increased in the brains of Parkinson's patients. Using cell culturing techniques, human neuroblastoma cells (HNC) were cultured and treated with the neurotoxin 6-hydroxydopamine. 6-Hydroxydopamine is a neurotoxic synthetic organic compound used to destroy dopaminergic neurons in the brain and is known to require Sab-mediated signaling for neuronal death. HNC were treated with a low dose (1nM) of drug over seven (7) days to emulate an age-related disease by destroying the nigrostriatal dopaminergic neurons. Following treatment, the cells were lysed and prepared for Western Blot analysis. The proteins present on the membrane via Western Blot analysis are expected to correspond to the proteins that are present in neurons displaying Parkinson's disease, such as PINK1, JNK, and SAB. Finally, it may be concluded that these proteins expression and interaction negatively affect the integrity of the mitochondria, which leads to neuronal cell death in Parkinson's disease.

Poster #29

Isolation, genomic characterization, and phylogenetic analysis of the unique *M. phlei* bacteriophage, Frankie.

Amanda Antosh, Sara Sewelson, Helen Wiersma-Koch, and Tom D'Elia
Indian River State College, Fort Pierce, FL.

Abstract

Bacteriophages are viruses that infect bacteria and use them for replication. The bacteriophage population is large, dynamic, and genetically diverse. Cataloguing the diversity of the bacteriophage population and the host range they infect is a crucial part of beginning to understand these mosaic genomes. The Actinobacteriophage database is extensive, with 9990 phage isolated from 13 genus of actinobacteria. Of these, 1932 phage have been sequenced. By far, the most extensive number of phage has been isolated and sequenced from *Mycobacterium smegmatis* (1344). Previous to this work, there has been only seven phage isolated and sequenced from *Mycobacterium phlei.* Here we report the isolation and sequencing of the eighth *M. phlei* phage, Frankie. DNA was isolated, the genome was sequenced, and the genome was manually annotated.

Frankie is 57,036 base pairs long, has 107 open reading frames, and zero tRNAs. Frankie is a member of the F1 subcluster of phages. The F1 subcluster encompasses 118 phages, only two of which have been isolated on *M. phlei.* Other *M. phlei* phage are in the A13, A3, and B3 subclusters. The eight phage that infect *M. phlei* are very diverse, as evident in being found in multiple clusters and subclusters, and there are no obvious similarities in their tail proteins that would suggest a common mechanism of infection of *M. phlei.* Frankie infects *M. smegmatis* as well as *M. phlei*. Future work will address whether the other *M. phlei* phage also infect *M. smegmatis*.

Poster #30

The role of kisspeptin in a sex changing fish.

Allison Wright[1], William Tyler[1], John Godwin[2], Shelby Durdan[1], Marshall Phillips[2], Chase Thompson[2], Elizabeth Dustin[2], Melissa Lamm[2].

[1] Indian River State College, Fort Pierce, FL; [2] North Carolina University, Raleigh, NC.

Abstract

The neuropeptide kisspeptin is of interest for sociosexual behavior in the bluehead wrasse *(Thalassoma bifasciatum).* Although the effect is unknown in bluehead wrasses, other fish species show that the neurological pathway of the *kiss1* gene helps regulate the secretion of Gonadotropin-Releasing Hormone (GnRH) which in turn regulates gametogenesis in reproduction. To better characterize the kiss1 pathway, qPCR was used to quantify expression levels of *kiss1* mRNA in two different sexual phenotypes, initial phase (IP) females and terminal phase (TP) males, at different points in the daily tidal cycle and times relative to spawning. These samples were captured on reefs near Key Largo, Florida. As tidal cycles are also associated with water temperature variation, water temperatures across the tidal cycle may be an important factor driving the timing and spawning. The effect of water temperatures on *kiss1* mRNA expression in a laboratory experiment was tested where fish were held at either 23.3 or 32.8 degrees Celsius (high and low monthly average water temperatures for Key Largo respectively). Previous research led to the prediction that *kiss1* mRNA should be expressed more in TP males than in IP females and expressed at higher levels immediately before spawning than when daily spawn is 10-12 hours away. We noticed a significant correlation between *gnih* and *kiss1* levels in TP males, but no correlation in females. Further research can help confirm the importance of *kiss1* and its relationship to *gnih* to help us better understand the neurological controls of tidally-driven spawning patterns and sex change.

Poster #31

Developing real-time RT-PCR primers for quantifying the small genomic segment of *Tomato chlorotic spot virus, Groundnut ringspot virus,* and Tomato spotted wilt virus

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[1]Indian River State College, Fort Pierce, FL; [2]USDA-ARS, U.S. Horticultural Research Laboratory, Fort Pierce, FL.

Abstract

Viral reassortment occurs when viruses infecting the same cell swap genetic material while being assembled inside the cell. This process can give rise to new strains of viruses with novel combinations of genetic material. Florida isolates of *Groundnut ringspot virus* (GRSV), a species of the Tospovirus genus, have been shown to contain the medium (M) RNA segment of *Tomato chlorotic spot virus* (TCSV), another species of the same genus. This is the first evidence of interspecies reassortment among members of this genus of the plant- and insect-infecting members of the Bunyaviridae family. As further reassortment occurs and facilitates genetic drift, plant and insect infections will presumably become a mosaic of genomic segments with additional polymorphisms. Three sets of real-time RT-PCR primers were made to detect the small (S) RNA segments of each of three species of Tospovirus: *Tomato chlorotic spot virus, Groundnut ringspot virus*, or *Tomato spotted wilt virus (TSWV).* The efficiencies of the TCSV, GRSV, and TSWV primers were 99.7%, 85.7%, and 101%, respectively. These primers allow simultaneous detection of the three target genome segments and quantification of TCSV, GRSV, and TSWV S RNA copy numbers in plants and insects containing mixed infections. Development of real-time RT-PCR primers detecting and quantifying the genomic segments of TCSV, GRSV, and TSWV may provide insight into the reassortment process of tospoviruses within plants and/or insects.

Poster #32

Incidental learning of olfactory cues in Tamaricia radiate

Frank Manthey[1], Paul Robbins[2], Aleena Moreno[2], and Joseph Patt[2]
[1]Indian River State College, Fort Pierce, FL; [2]USDA-ARS, U.S. Horticultural Research Laboratory, Fort Pierce, FL.

Abstract

Tamarixia radiata is an important parasitoid of Asian Citrus Psyllid (*Diphorina citri*) and a strong candidate for biological control as it is host specific to *D. citri*. When populations of psyllids are low, *T. radiata* will feed incidentally on nectaring plants. To enhance *T. radiata*'s ability to control psyllid populations in commercial groves, a better understanding of its feeding habits are required. First, we established a method of stimulating *T. radiata*'s foraging behavior. Next, we used this method to conduct an assay aimed at determining *T. radiata*'s capacity to learn novel olfactory cues and search for their source. In the first assay, *T. radiata* was stimulated to feed on various sugar solutions including sucrose, honey dew, and various plant sugars. This assay showed that *Tamarixia* fed on sucrose solution and banana scented sucrose (an olfactory que novel to *T. radiata*), but not banana scented water. The second assay involved creating a stage mounted with cups filled with either a sucrose solution or banana scented sucrose. *T. radiata* were stimulated to

forage on either a sucrose or banana scented sucrose and then placed on a stage where cup choice and the time it took to start feeding was recorded. The results showed that *T. radiata* is able to learn and utilize novel olfactory cues and effectively pursue those cues. Going forward we can use this knowledge to enhance *T. radiata*'s fecundity in commercial groves by supplementing its diet on plant nectars.

Poster #33

Biodiversity of marine sponges from southern Myanmar

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Abstract

As sponges are one of the most abundant and diverse groups in marine ecosystems, studying their diversity within a particular region is a good indicator of overall biodiversity and health of the ecosystem. The coastal area of Myanmar and the nearby Andaman & Nicobar Islands constitute some of the most diverse reefs in the world, and it is therefore important to maintain a healthy ecosystem for continued diversity in the area. In this study, fifty sponges were collected from the coast of Myanmar from 28 different sites to be classified. The morphological characteristics of the skeletal elements and organization were used as well as general shape, size, and surface structure of the sponge to classify each sample. In the case of a few of the sponges, scanning electron microscopy was used to differentiate the spicules. Sponges belonging to at least five different orders (*Haplosclerida, Agelasida, Halichondrida, Suberitida, Tetractinellida*) and eight different families of the class *Demospongiae* were identified. The abundance of sponge taxonomic diversity within the sites is indicative of a rich ecosystem biodiversity. Further research would include mitochondrial CO1 and/or 28S ribosomal subunit gene barcoding. Barcoding would be useful in making more accurate classifications of the samples that are rare or too small to observe their morphological characteristics.

Poster #34

RNA interference in *Diaphorina citri* (Hemiptera: Liviidae): Analysis of mortality as a Result of Downregulating Rab11A

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Abstract

Diaphorina citri, the Asian citrus psyllid (ACP), is the primary vector for the bacterium, Candidatus *Liberibacter asiaticus*, causing citrus greening (HLB). HLB results in tree deaths and loss of viable fruit, causing great damage to the United States' citrus industry. Following manual annotation of the Rab gene family, dsRNA targeting Rab11A was used in RNAi treatments. Bioassays on ACP were performed to determine the efficacy of Rab-targeted RNAi as a bioinsecticide. Mortality was measured at 4 intervals across 10 days. Treatments were added to water, and absorbed into fresh citrus cuttings. Experimental treatments included 10 and 100 ng (in

water) of dsRNA-Rab11A, dsRNA-arginine kinase, and dsRNA-green fluorescent protein, plus water only. Approximately 20-45% total mortality was observed with dsRNA-Rab11A at 10 ng across all trials with the majority occurring after day 6 post exposure. dsRNA-Rab11A 100 ng treatments resulted in 7-43% mortality across all trials, with the greatest mortality in Trial 3. The die-off pattern of 100 ng treatment mimics that of dsRNA-Rab11A 10 ng treatment in trials 2 and 3, with less mortality in trial 1. However, mortality data between the three trials indicated no significant difference between treatments. Real-time PCR was used to determine expression and inhibition of target.

Poster #35

Correlation between nest orientation and nest success in purple martins

Jordan Marshall, Bill McCarthy, and William Tyler, Ph.D.
Indian River State College, Fort Pierce, Fl.

Abstract

The purpose of this study was to identify if there is a correlation between the directionality of purple martin nests (gourds) and nest success which is measured by how many eggs hatch and make it to the point where they leave the nest. This research could be used for the conservation of the purple martin as a species. While they are not endangered, habitat loss and invasive species threaten their population size, and, in the future, they could become threatened. Research on how to increase nest success and ultimately increase the wild population of purple martins could be useful for the possible future need to preserve this native, migratory species. In this experiment, purple martin nests, during one breeding season, were examined and the different life stages of the birds were counted in each individual nest. The opening of the nest was also examined for the cardinal direction it was oriented in. Statistical analyses determined if there is a correlation between the directionality of the nest opening and nest success. While there was no statistical significance found, there was a higher number of eggs laid and a higher number of feathered hatchlings in the nests whose openings faced in the western direction.

Poster #36

Variation of pressure pain threshold in ultra-marathon exercise

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Indian River State College, Fort Pierce, FL.

Abstract

Ultra-marathon races have gained a lot of popularity in recent years and are becoming ever more popular, attracting a wide variety of people ranging from veteran ultra-endurance athletes to novice competitors. Ultra-marathons cause a great deal of pain and muscle strain on the runners. There is a lack of research data available on injury and pain mechanisms during ultra-marathon races. Using the Pressure Pain Threshold (PPT) technique we investigated variations in pressure pain sensitivity to gather a better understanding of the ultra-marathon pain variations. The races took place in tropical environments with mostly flat, sandy and firm terrain. PPT was measured using a Baseline© Dolorimeter. The device was placed equidistant to the radial and the ulna styloid processes and a trained technician gradually applied pressure until the subject indicated that they felt a change from pressure to pain. Neither the technician nor the subjects were able to see the

measurement of pressure being applied while the experiment was being conducted. This was repeated for a total of three times and the mean score was utilized for statistical analysis. T-tests were used to assess pre/post variation in PPT. PPT was significantly decreased ($p<0.05$) for 25, 50 and 100-mile competitions. A decrease in PPT from 25, 50 and 100-mile ultra-marathons suggests nociceptor plasticity. Inflammation, which has been shown to result in decreased PPT, is likely to occur during this type of exhaustive exercise. More PPT research that deals with inflammatory biomarkers, including IL-6, C-reactive protein and cortisol should be collected.

Poster #37

Antioxidant capacity of beta-carotene

Leonardo Albertini, Chelsea E. Trost†, Marie V. Roche†, Ana C. Figuereo†, and Dr. Luis C. Fernandez-Torres†*

**Miami Dade College, Miami, FL; †St. Thomas University, School of Science, Miami Gardens, FL*

Abstract

Beta-carotene is a pro-vitamin with a characteristic orange color found in many different foods such as carrots and spinach, and is often sold as a supplement, marketed as an antioxidant. This project aims towards determining the antioxidant capacity of products containing beta-carotene, and comparing those results to pure beta-carotene. To do this, the Briggs-Rauscher oscillating reaction was used, which is a method employed for analyzing the antioxidant capacity of samples. The antioxidant molecule scavenges free radicals formed in the reaction and neutralizes them. This process elongates the time intervals of reaction's oscillations; therefore, the higher the antioxidant capacity the longer the oscillation delays. To analyze the results we used the Relative Antioxidant Performance (RAP), where the slopes of the samples were compared to the Trolox standard. When testing the pure beta-carotene and the beta-carotene pill, we hypothesized they both would slow down the oscillation frequency. The pill form showed a higher antioxidant capacity with a RAP of 0.81 as opposed to the 0.31 of the pure form. This may be caused by the presence of other ingredients in the pill. Furthermore, foods containing beta-carotene, such as mango and spinach, were tested and they increased the oscillation delays, proving they contain antioxidants as well.

Poster #38

Towards carbon based nanotechnology: assembling a NanoBeetle from a curved [5]-Norbornane chassis and para-carborane wheel train.

Summer Alsadah and Servando Muñoz

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Abstract

A nanocar can be defined as a device measuring between 1 – 100 nm whose wheels would rotate rather than slide or drag due to supramolecular van der Waals friction when in contact with the plane of an atomic surface. In our research, we have created a NanoBeetle from a curved chassis made up of five bicyclic norbornane rings fused in an exo, exo orientation with syn-facial stereochemistry. The wheel train is built from fluorinated para-carborane wheels using a linear

ethynyl group shaft as the axle. Hartree-Fock 3-21G quantum mechanical calculations show the rotational energy barrier of the carborane wheels to be about 2.0 kJ/mole. The small barrier suggests that the NanoBeetle would rotate rather than slide its wheels while traversing a flat molecular surface such as that of graphene.

Poster #39

Potency of antifungals from streptomyces associated with termites

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Abstract

Termites efficiently developed their own defense mechanism through Streptomyces that produce antibiotic compounds, providing them with protection against specific pathogens. The purpose of this project was to identify the potency of 10 Streptomyces strains isolated from the fecal nest of a termite colony, when exposed to 5 different species of fungi. This has been done by testing for their antimicrobial activity against five fungal entomopathogens: *Penicillum Sp., Aspergilus nomius, Metharhizium anisopliae, Beauveria bassiana, Trichoderma sp.* The first step of the process included growing bacteria in petri dishes for 4 days. Then, covering the culture with a thin layer of water agar containing a fungal spore suspension and let it grow for another three days. Upon testing, the zone of growth inhibition was determined by measuring the distance between the edge of the bacteria and the edge of the zone of inhibition. This distance identified the potency of each Streptomyces strains. This research highlights the importance of Streptomyces strains in protecting termites which can also be a good source of antibiotics for medical purpose.

Poster #40

Towards Carbon Based Nanotechnology: Vertical translocation of potassium cations through a three-dimensional graphene pillar

Gabriel Blanco and Servando Muñoz
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Abstract

Graphene is a single layer of graphite which is only one atom thick and yet visible to the unaided eye. Graphene pillars are a three-dimensional hybrid material in which adjacent layers of graphene are connected by single-walled carbon nanotubes, SWCNT's. In our research, we have used quantum mechanical analysis at the Hartree-Fock 3-21G level of theory to study the permeability of potassium cations through graphene pillars. Our results suggest that the graphene mosaic facilitates the passive diffusion of potassium cations through the carbon nanotube channels. Thus, three-dimensional carbons may have important practical applications as controlled-pore molecular filtration assemblies in water desalination technology.

Poster #41

Properties of dielectric photonic band gap material at microwave frequencies

Madeline Demateo, Soumia Souchak Ph.D.
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Abstract

The study concerns the properties of Dielectric Photonic Band Gap Material (DPBGM) in the microwave frequency range. The DPBGM, which we studied was made of dielectric rods disposed in an isosceles right-angled triangle. First, the transmission diagram is calculated with a numerical code developed in the University of Glasgow, and then validated with the High Frequency Simulator Structure HFSS software developed by Ansoft. In the first allowed frequency band, the dielectric Photonic Band Gap Material with and without defects behaves like homogeneous medium. In forbidden band frequencies, the surface defects create new electromagnetic modes in the dielectric photonic band gap material.

Poster #42

Confirming Huanglongbing in Miami Dade County

Daniel G. Diaz[1] and Dora Pilar Maul[2]. [1]Miami Dade College North Campus, Miami, FL, [2]St. Thomas University, Miami Gardens, FL

Abstract

Huanglongbing (HLB), or citrus greening disease has already cost millions of dollars in revenue losses to the Florida Citrus Industry. This disease, reported to be widespread in this state, is caused by the bacteria *Candidatus* Liberibacter asiaticus (CLas). HLB affects both citrus fresh fruit and juice, making them unmarketable. The purpose of this study was to confirm the presence of the disease in Miami Dade County by testing random samples of citrus leaves from residents' backyards. Three different citrus species (*Citrus sinensis, Citrus aurantium, and Citrus limon)* were collected from different locations within the County. DNA extracted from leaf blades and veins was used in polymerase chain reactions. Two primer sets were tested: Las606/Lss (L-primers) and OI1/OI2c (Oi-primers), both specific for regions of the CLas 16S rDNA. L-primers successfully detected the bacteria in *C. sinensis* (orange) and *in C. aurantium* (sour orange) but not in *C. limon (lemon).* Oi-primers gave inconsistent results. The results of this study support the hypothesis that citrus greening disease is present in Miami Dade County.

Poster #43

Comparison of purification methods of green fluorescent protein from recombinant Escherichia coli strains: HB101, DH5α, TOP10 and DH10

Maria Jose Garavito, Nobuyo Nakamura, Maximilien Vandenhove and Professor Juan Morata
Miami Dade College, Miami, Fl.

Abstract

Green fluorescent protein (GFP) is frequently used in molecular biology as a reporter for gene expression and incorporated into an E.coli plasmid. Four strains of E.coli were transformed using the PGLO vector plasmid obtained from BioRad© (HB101, DH5α, TOP10 and DH10β). The transformed bacteria had GFP expression as part of their DNA and produced the protein, which glows green under ultraviolet light. The study purified the protein obtained from and compares the fluorescence emitted from DH5α and HB101 as well as the amount of protein produced. Different methods were used for protein quantification, such as ProteinA280 spectrophotometry, Bradford assay and fluorescence intensity method. At the end of the study the highest protein yield and fluorescence intensity was observed from DH5α and DH10β. Further studies will include protein quantification for HB101 and TOP 10 as well as transformation of Pseudomonas aeruginosa.

Poster #44

Dynamical stability analysis of tumor-host interactions under a periodic perturbation

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Abstract

The interaction tumor-host and different stages of tumor development are successfully described by the Lotka-Volterra model. The dynamic of this model is characterized by a linear stability analysis, used to determine critical parameters that define the dynamical regimens. The effects of constant and periodic perturbations are discussed, as well as their implications. It is shown that aggressive tumors evolve to a limit cycle under the action of a low frequency periodic perturbation, and for higher frequencies a transition to a non-chaotic attractor occurs that tends to contract with an increment of the frequency. Similar behaviour is observed in the simulations for the three-dimensional model. According to the simulations Chaotic behaviour was not detected, even for higher values of both strength and frequency of the perturbation the maximum Lypunov exponent was negative. These results indicate that although high aggressive tumors cannot be eliminated by conventional therapies, they can be controlled using periodic therapies.

Poster #45

Optimizing genomic DNA extraction for a PCR-based screen of Myosin genes in *Sabal yapa*

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Abstract

Motor proteins are the basis of movement in biological systems. There are 3 major families of motor proteins: Myosins, Kinesins and Dyneins. This research project is focused on identifying new members of the Myosin superfamily. There are three classes of myosins that are known to exist in plants: classes VIII, XI, and XIII. Classes VIII and XI have been found in higher plants including flowering plants, and class XIII myosins are known to exist solely in algae, but no myosin gene has been reported in Sabal palm species. The objective of this study is to identify and characterize myosin genes in the palm *Sabal yapa* using a Polymerase Chain Reaction (PCR)-based genomic screen. A critical step in this process is the isolation of high molecular weight genomic DNA from *Sabal yapa* leaf tissue. A phenol-isoamyl-chloroform-based DNA extraction protocol was tested using 2 different methods of tissue homogenization: mechanical blending (Procedure 1) and manual crushing (Procedure 2). DNA extractions from SDS-treated lysates and non-SDS lysates were conducted followed by ethanol precipitation. It was concluded from the results that Procedure 2 was more effective in extracting a higher yield and quality of DNA than Procedure 1. The manual grinding of the leaf tissues in Procedure 2 was more effective than the blending technique used to create the original homogenate in Procedure 1. Mechanical blending resulted in the shearing and degradation of the DNA, whereas manual grinding significantly reduced shearing and improved overall yield. This latter extraction method is therefore more suitable for isolating the high molecular weight genomic DNA required for an effective PCR screen.

Poster #46

EGFRVIII mutation in Glioblastoma confers increased sensitivity to Glycolytic inhibition

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Abstract

Epidermal growth factor receptor (EGFR) is an important regulator of normal cell proliferation, however in cancer it is often overexpressed and/or mutated. The most common mutation is EGFRVIII and unlike EGFR, does not need EGF binding to become activated rather it is constitutively active. EGFRVIII is found in multiple cancers and correlates with tumor aggressiveness and poor outcome. In glioblastoma (GBM) expression of EGFRVIII is linked to cell-signaling pathways required for increased cell proliferation, cancer stem-cell self-renewal and tumor invasiveness. The mechanisms by which EGFRVIII confers increased tumorigenicity are not fully understood. Activation of the EGFR/PI3K/AKT/mtor pathway has been shown to regulate aerobic glycolysis therefore we hypothesized that GBM cells expressing EGFRVIII would be more susceptible to glycolytic inhibition. The effect of EGFRVIII in response to glycolytic inhibitors was determined by comparing the GBM cell lines U87 and U87-EGFRVIII, which was genetically modified to express EGFRVIII. Cell lines were exposed to increasing concentrations

(0.01-4mM) of the glycolytic inhibitor, 2-deoxy-D-glucose (2-DG) and viability was determined at 72 hours using MTS assay. U87-EGFRVIII cells were significantly more sensitive to 2-DG compared to U87 cells. Compared to non-treated controls (100% viability), 0.1mM and 0.5mM 2-DG reduced viability to 87.9±1.4% and 71.1±3.6% in U87 cells verses 61.6±7.6% and 24.5±1.1% in U87-EGFRVIII cells, respectfully. EGFRVIII mutation in GBM is associated with more aggressive disease however we found it mediates increased sensitivity to glycolytic inhibition suggesting that glycolytic inhibition may be beneficial to patients whose tumors contain the EGFRVIII mutation.

Poster #47

Genomic DNA extraction and detection of Helicosporidium sp. isolates in fresh water lakes

Valerie Dominguez and Denise Machado
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Abstract

Helicosporidium algae, an invertebrate pathogen detected in various mosquito hosts that is commonly found in tropical climates. *Helicosporidium*, according to Jaroslav Weiser (1970), causes lysis of host's tissues and can also act opportunistically by entering a host through an open wound. The identification of various isolates of the pathogen can assist in the reconstruction of the phylogeny and with sufficient discovery of *Helicosporidium* isolates, the algae can be used as agents for biological control. The detection of the 18S rDNA and B-tubulin genes in *Helicosporidium*, was made possible by using gene specific primers (OomCox 1Levup + Fm 85 and 69F + 1577R) on extracted DNA from local bodies of water. Samples were collected from multiple locations in the south Florida area where mosquito population can be found. After collection and filtration of water samples, the extracted DNA was amplified using polymerase chain reaction utilizing Taq Polymerase. The analyses of several amplified DNA sequences demonstrated the detection of *Helicosporidium* in bodies of water and will be analyzed further using positive controls containing the target DNA sequence.

Poster #48

Novel Curcumin Analogs as treatment for Glioblastoma STEM cells

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Abstract

Background. Glioblastoma multiforme (GBM) is the most common deadly form of malignant brain tumor in adults. After standard treatments and surgical intervention patient's survival rate is between 12-14 months. GBM stem cells (GSC's) are the theorized cause of cancer recurrence and patient relapse. We found that curcumin targets multiple signaling pathways vital for GSCs self-renewal and cell proliferation and induces cell death with an IC_{50} approximately 25μM, however this concentration is hardly sustainable in the brain. Therefore, we sought to increase the effectiveness by modifying the curcumin molecule using novel bis-chalcone natural structure

analogs. **Methods.** Heteroaryl bis-chalcones were synthesized via Claisen-Schmidt condensation between 2,6-diacetylpyridine and hydroxyl and/or alkoxy substituted benzaldehyde derivatives. Multiple patient-derived GSC lines were treated with increasing concentrations of curcumin analogs and the IC_{50} was determined using MTS viability assay. Western blot analysis was used to determine effects on cell signaling. **Results.** Of the fourteen analogs examined LS-146, LS-296, LS-297 and LS-301 were the most effective with average IC_{50} values of 5.8 ± 0.6, 2.7 ± 0.1, 6.8 ± 2.1 and $3.6\pm0.6\mu M$ respectfully. Furthermore, these analogs induced caspase 3 activation and PARP cleavage indicative of apoptosis. **Discussion**. Out of the fourteen analogs that were synthesized, only the four previously mentioned were approximately 5-10 fold more effective than curcumin. Ongoing studies will determine the molecular mechanism of these analogs and the efficacy in a mouse model of GBM. The findings of this research may lead to a novel treatment to prevent recurrence in GBM by successfully targeting GSCs.

Poster #49

The effect of acute aerobic exercise on neurophysiological, biochemical, and self-report measures of emotion processing

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Abstract

Aerobic exercise is associated with increased emotional well-being and has been shown to protect against depression and other mood disorders. However, the physiological mechanisms through which exercise changes mood are currently unknown. In order to address this uncertainty, we compared physiological and self-report correlates of emotion processing after an acute aerobic exercise session compared to a control condition (n = 20, 10 males, mean age = 21, SD 2.78). The aerobic exercise session consisted of a jog on a treadmill for 30 minutes at 70-80% aerobic target heart rate. We measured biomarkers associated with emotion processing and increased arousal (salivary alpha amylase and cortisol) at 4 different time-points at each session. Mood assessments included the profile of mood states and the state trait anxiety inventory. In order to examine brain changes associated with emotion processing, participants underwent EEG testing for the event-related potential (ERP) late positive potential (LPP). The LPP is an established measure of attention to emotionally-charged visual stimuli. We found that, relative to baseline testing, the LPP amplitude to emotionally-negative pictures is reduced after exercise ($p < 0.05$ at multiple electrode locations), suggesting decreased amygdala responsivity after exercise. In agreement, self-report measures also showed improved mood after exercise, relative to the control session $t(19) = 2.27$, $p = 0.04$. We also saw a significant session by time interaction for cortisol $F(3,57) = 4.11$, $p = 0.01$ and alpha amylase $F(3,57) = 3.63$, $p = 0.02$. Combined, these findings demonstrate a possible neurobiological explanation for mood improvements following exercise.

Poster #50

Towards Carbon Based Nanotechnology: A self-assembled pH-driven supramolecular piston from N-(3,6,9,12,15)-pentaoxaoctadecylglycine and a cyclic β-peptide nanotube

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Abstract

Our research is concerned with synthetic beta amino acids which when covalently linked form cyclic peptide rings that self-assemble into a peptide nanotube through cooperative intermolecular hydrogen bonding. Guest zwitterionic N-(3,6,9,12,15)-pentaoxaoctadecylglycine will be used as a molecular rod that threads the cavity of the peptide nanotube host. Under the stress of a transient, reversible pH gradient, the zwitterionic rod can undergo periodic vertical translocation as it interacts with the net macromolecular dipole within the hollow peptide nanotube cylinder. Thus, the host-guest complex can function as a molecular nanopiston that would efficiently transduce chemical energy into mechanical energy in a manner that is reminiscent of the traditional four-stroke internal combustion engine.

Poster #51

Changing your thoughts: The impact of a brief mindfulness training

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Abstract

Mindfulness meditation may be an effective intervention for reducing stress-related impairments. An 8-week mindfulness mediation training with pre-deployment military cohorts prevented stress related cognitive performance deficits and increased cognitive resilience (Jha, Morrison, Parker, & Stanley, 2016). A one-week mindfulness meditation training resulted in decreases in the impact of mind wandering—task unrelated thoughts (TUTs)—on working memory performance (Banks, Welhaf, Srour, 2015). Longer mindfulness training interventions have shown decreases in mind wandering following training (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013). In the current study, participants were assigned to either a mindfulness meditation, relaxation, or control condition. Following completion of a 15-minute training based on condition, all participants completed a writing stress manipulation. Participants then completed a sustained attention task (SART) with thought probes embedded to measure mind wandering. A series of ANOVA's were conducted to examine any possible differences between conditions on the SART measures. No differences were observed on any measures from the SART, *p's* > .05. Participants in the mindfulness condition experienced significantly fewer negatively valenced TUTs (*M* =5.66%) than participants in the relaxation condition (*M*= 13.26%), *t* (44) = 2.08, *p* < .05, *d* = .66. A series of regression analyses examined predictors of SART performance by condition. Negative TUTs served as the only predictor of SART performance in the relaxation condition, β= -.64, *t* = 3.08, *p* < .01. Negative TUTs did not predict SART performance in the mindfulness condition, *p* > .05. Suggesting that mindfulness protects against the impact of negatively valenced mind wandering.

Poster #52

Examining the stress-gut microbiome interface in a human population

Eileen Davidson, Reaghan May, Sarah Lyle, Jaime L. Tartar Ph.D., Jose V Lopez Ph.D., Robert P Smith Ph.D. Nova Southeastern University, Ft. Lauderdale, FL

Abstract

Diverse symbiotic microbial communities are harbored on and within most eukaryotic host organisms, including humans as "microbiomes". The human gut microbiome represents one of the best-studied microbial communities in nature. Recent research on the gut has indicated that the microbiome can influence human behavior, metabolism, and disease states. However, it currently remains unclear as to how the diversity in the gut microbiome may affect stress. To address this open question, we sought to sample gut microbiome from two populations of participants: stressed and non-stressed males. Neurobehavioral measures of emotion processing and cognition were assessed through the NIH Toolbox platform and the Joggle cognitive battery, respectively. We observed that biological markers of stress, such as cortisol, were highly correlated with perceived stress and preliminary data show that, overall, neurobehavioral scores were lower in the stressed group relative to the non-stressed group. To correlate gut microbiome diversity with biological and neurobehavioral measures of stress, we are currently using Illumina genomic sequencing to identify abundant genera in fecal samples taken from patients. Overall, our study is the first to examine the correlation between gut-microbiome diversity and stress. Our results may lead to novel mechanisms to reduce stress by rationally perturbing microbial diversity in the human gut.

Poster #53

Detection of *Lagenidium giganteum* in phytotelmata microbiomes

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Abstract

The entomopathogenic oomycete *Lagenidium giganteum* is known to infect and kill mosquito larvae, but phylogenetic analyses have consistently demonstrated that it is a close relative to plant pathogens (*Phytophthora* and *Pythium* spp.). In addition, a recent transcriptome analysis showed that *L. giganteum* expresses oomycete genes that have been associated with plant infection. These observations suggest that *L. giganteum* might have evolved from a plant pathogen to an invertebrate pathogen, and have retained the ability to establish symbiotic or pathogenic interactions with plant tissues. To test this hypothesis, a metagenomic survey of plant material was initiated. Specifically, phytotelmata collected from plant axils (Bromeliaceae) were processed for metagenomic DNA extraction, and Polymerase Chain Reactions (PCR) were performed in an effort to (i) detect *L. giganteum*, and (ii) estimate the relative abundance of *L. giganteum* compared to other oomycetes. First, the presence of oomycetes in all sampled phytotelmata was confirmed by PCR reactions, using oomycete-specific *cox1* primers that were previously published and tested in a barcoding study. Next, the use of a *L. giganteum*-specific primer set demonstrated that the *L.*

giganteum cox1 barcode can be amplified and sequenced from phytotelmata metagenomic DNA, suggesting that this oomycete is able to colonize environments that are consistent with a close relationship to both plant tissues and mosquito hosts. Finally, the phytotelmata oomycete community was profiled by high throughput sequencing (PacBio platform) of the amplified cox1 barcodes (800bp), in order to determine the relative abundance of *L. giganteum* among all oomycete species.

Poster #54

The efficacy of Bioven upon the transition to sublingual delivery as an alternative route of administration: dissolution, protein analysis, and contamination

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Abstract

Bioven is a sublingual pain relief treatment of Rheumatoid Arthritis and Herpes Simplex I and II due to its anti-inflammatory and anti-arthritic properties. Bioven is also more specifically considered as a FDA tested homeopathic immune-modulator product, which helps naturally boost the body's immune system. This experiment is a thorough study on various components of Bioven, particularly the efficacy of dissolution for an average tab, the protein amount in a Bioven strip, and microbiological contamination. Essentially, the homeopathic product has a relative dissolution rate of 18.3 seconds in artificial saliva composed of 0.5 M concentration of carboxymethyl cellulose while it has a relative dissolution rate of 25 seconds in artificial saliva composed of 0.8 M concentration of carboxylmethyl cellulose. Likewise, it was concluded that a film form of Bioven contained 13 μg/ml of BSA and 0.4% absorbance of albumin at 560 NM reading per tab while the liquid form of Bioven contained 15 μg/ml of BSA and 0.5% absorbance of albumin at 560 NM reading per tab. Using a Pierce BCA Protein Assay Kit, we observed that sublingual delivery in tab form is less effective because it does not adequately disperse albumin compared to the pure liquid representative of the intravenous delivery method of Bioven. In regards to contamination, no contaminations were found in the various tabs from different Bioven packages. These comprehensive results will contribute to further research on the optimization of the sublingual treatment in clinical studies concerning patients with Rheumatoid Arthritis and Herpes Simplex I and II.

Poster #55

Examining the Effects of Blue Light on Melatonin, Mood, and Neurobehavioral Performance.

Reaghan May, Ava Bittner, O.D., Ph.D., Jaime L. Tartar, Ph.D.
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Abstract

The pineal hormone *melatonin* can become dysregulated with evening light exposure and changes in sleep/wake behavior. Dysregulated melatonin is associated with impaired mood and cognitive performance. This study examines the effects of modifying short-wavelength (blue) light exposure on evening melatonin levels, sleep disturbances and self-reported mood. To that end, we are testing

the effect of blocking blue light during the evening on salivary melatonin, sleep quality, cognitive performance, and mood. Participants undergo one control and one experimental condition involving the use of filtered glasses to attenuate blue wavelength light using a repeated measures, randomized crossover design. The control and experimental condition consists of five days of monitoring using actigraphy watches to non-invasively record sleep patterns, activity level, and light exposure. During the experimental condition participants are instructed to wear a pair of specialized glasses that reduces short wavelength light in the evening. Melatonin levels are quantified from saliva samples. We assess self-reported health through the NIH Toolbox Emotion battery. Neurobehavioral performance is assessed across cognitive domains through a series of tasks on the NIH Cognition Toolbox battery. Preliminary results show an increase in melatonin levels as well as an increase in self-reported overall life satisfaction and a decrease in fear, sadness and anger after just five days of evening blue light suppression. The use of light altering glasses will show how this intervention can potentially be applied to at risk populations (e.g. shift-workers or students who spend nighttime hours studying with electronic devices) in order to lessen the deleterious effects of light exposure at night.

Poster #56

Screening for type III secretion system inhibitors

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Abstract

Commonly used antibiotics are becoming less effective since overuse creates a selective pressure for bacteria to become resistant, leading to the formation of “super bugs”. Some of these pathogenic bacteria include *E. coli, Salmonella, Chlamydia* and *Yersinia* species. These species utilize a type III secretion system (T3SS), which are needle-like structures on their surface used to inject host cells with toxins in order to evade our immune system and cause infection. Recently, a new method for testing compounds to determine if they inhibit the *Y. pestis* T3SS was developed by our lab. This method uses a special growth medium called Magnesium Oxalate (MOX) agar, which produces distinct growth characteristics based on the bacteria's ability, or inability, to secrete toxins. The goal of this research was to use this method to screen for antimicrobials produced by soil bacteria that may target T3SSs. Many species of bacteria found in soil produce antimicrobials in order to compete with each other for nutrients and space. Serial dilution plating was used to isolate soil bacteria and each isolate was patched onto MOX agar plates pre-inoculated with *Y. pestis*. After incubation, the areas around each soil isolate were analyzed for the *Y. pestis* growth characteristics associated with blocked T3S or growth inhibition. The soil bacteria that exhibited positive results were identified using 16S rDNA sequencing. *Bacillus cereus* strain JEM-2 and *Bacillus amyloliquefaciens* strain SSH100-3 were soil isolates identified to have antibacterial activity against *Y. pestis*.

Poster #57

Art and microbiology combined in a unique arts and sciences collaboration

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Abstract

Recently, STEM has expanded to include art and design education creating STEAM. Collaborations between the arts and sciences create bridges into new ideas and processes that can benefit the artistic mind as well as the scientific mind. The goal of this project was to have Nova Southeastern University art students participate in a microbiology laboratory workshop within the Department of Biological Sciences in order to learn how to use agar as a canvas and bacteria as paint to create works of art. The learning outcomes included: 1) educate art students on proper lab techniques; 2) provide basic information regarding each bacterium used (i.e. its name, what medium it grows on, what color colonies it produces, and the shapes of the colonies); 3) inspire art students to be open to the idea of using unusual mediums to create meaningful works of art; and, 4) demonstrate that science and the arts can be combined in a unique project. The students interpreted artworks of well-known artists and were successful in creating their own colorful agar art. As a result of this collaboration, the students learned how to use microbiology and drawing techniques to bridge the gap between two seemingly opposite subjects. The images were entered into the annual American Society for Microbiology's Agar Art contest. Last year, the contest received 117 entries from 26 countries and 17 U.S. states. Two of our students were amongst the 50 finalists chosen.

Poster #58

***ME/CFS genes study*: creating a de-identified Myalgic Encephalomyelitis/Chronic Fatigue Syndrome genomic database and analyzing SNPs frequency trends for potential diagnostic biomarker establishment**

Melanie Perez[1], Kelly Gaunt[1], Kristina Gemayel[1], Syed Shehzad Ali[1], Abhaya Moturu[1], Maria Cash[1], Jacqueline Baikovitz[1], Kevin Galvez[3], Leonor Sarria[1], Angela Vu[1], Ishan Shah[1], Nirja Patel[1], Marquis Chapman[1], Rajeev Jaundoo[1], Ana Del Alamo[1], Dr. Irma Rey[1], Dr. Maria Vera[1,2], Dr. Nancy Klimas[1,2], Travis Craddock[1], Lubov Nathanson[1]
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Abstract

Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) is a debilitating disease with unknown causes. It is known that Single Nucleotide Polymorphisms (SNPs) play an important role in gene expression. Changes to that can manifest as phenotypic changes. Prior to this ongoing study, there existed no known databases of SNPs in patients diagnosed with ME/CFS. Our objectives are to create and continually update a novel database of SNPs that are specific for ME/CFS patients, and to identify the relative frequency in our cohort of specific SNPs warranting further research. A genetic database was created on-site through the use of a secure user-friendly online platform, REDCap©, for participants to upload their raw genetic data, acquired from

23andMe. The uploaded de-identified genetic data acquired from RedCap is modified to a suitable format for *Seattle Sequence Annotation 138.* The annotated data is then filtered to include only non-synonymous and nonsense SNPs from protein coding regions (exons), microRNAs, and SNPs that are close to splice sites. The frequencies of each SNP will then be calculated within our cohort and compared to public databases. Those SNPs frequencies of differing prevalence between our database and the general public will be noted for further analysis. Ongoing recruitment for submission of de-identified genetic data to our database leads to a constantly increasing sample size for continual application of the aforementioned method. Additional SNP investigation from the larger sample size will allow for validation of SNP trend significance relative to existing SNP data acquired from public databases.

Poster #59

Behavioral Response of Small Everglades Fish to Hydrological Variation, Predator Cues and Parasites

Stacey Spadafore, Domenique Olesen, Ava Cole, Jeffrey Matthew Hoch, PhD. and Christopher Blanar, Ph.D. *Nova Southeastern University, Ft. Lauderdale, FL*

Abstract

Mindfulness meditation may be an effective intervention for reducing stress-related impairments. An 8-week Small fish are important to the Everglades ecosystem as primary and secondary consumers and as a food source for higher trophic levels. In short-hydroperiod wetlands, these fish must migrate to refuge areas or risk stranding, and have been observed to rapidly recolonize during the wet season. The goals of this study are to understand what influences annual migrations to and from short-hydroperiod wetlands. We aim to link individual variation in behavior to population-level movement. We specifically tested whether the willingness of fish to explore and move through unknown environments varied among species, with hydrological season, wetland hydroperiod, or parasite load). We tested the hypothesis that waterborne cues might influence risk aversion and likelihood of entering unknown areas. We used a factorial experimental design to measure effects of visual predator cues (using a bird model), chemical cues from bird feces, or food motivation on the behavior of eastern mosquitofish. Fish were filmed exploring an artificial habitat, and we examined data like the time spent hiding, total distance traveled, variation in speed and other movement variables. We found that behavior varied significantly among species, with eastern mosquitofish (Gambusia holbrooki) the most likely to explore and golden topminnow (Fundulus chrysotus) the least so. Most fish were parasitized, some with parasites from taxa known to modify host behavior. To date, small sample size limits our ability to draw conclusions from this experiment, but it seems likely that these factors influence fish migration in nature.

Poster #61

Longevity of Visual Improvements following Electro-Stimulation Therapies and Efficacy of Retreatment in Retinitis Pigmentosa subjects

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Abstract

Background: Roughly half of retinitis pigmentosa (RP) subjects who received Transcorneal Electrical Stimulation (TES) and 29% who receive electro-acupuncture developed significant improvements in vision during a small-scale randomized controlled trial by our group. **Methods**: We longitudinally monitored four RP subjects for declining vision due to natural RP progression, at which time a retreatment course of six weekly TES sessions or 10 electro-acupuncture sessions was administered. **Results**: A 44 y/o female improved from 20/665 to 20/66 in the worse eye following the initial course of TES, but diminished to 20/333 ten months later, at which time retreatment improved vision to 20/83. Follow-up visits at 6-9 months post-retreatment revealed slight declines to 20/120-126, then improved again to 20/63 after receiving a second retreatment. A 47 y/o male improved from 20/279 to 20/106 in the worse eye after the initial course of TES; then 11 months later he was relatively stable at 20/116, which then declined to 20/168 three months later, at which time he was retreated and improved to 20/140. A 34 y/o female improved binocularly from 20/264 to 20/200 after initial TES, then after slight declines every 3-4 months, she received 3 retreatment courses, which helped maintain her vision over 18 months. A 46 y/o male who received three electro-acupuncture courses and one TES course had no progressive macular atrophy or visual function loss over 27 months. **Conclusions**: Following encouraging improvements after electro-stimulation therapies that lasted for several months, it appears possible to restore slowly diminishing vision over time with retreatments.

Poster #62

Identification of senotherapeutics that extend healthspan in progeroid mice

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Abstract

In the Niedernhofer lab we focus on discovering the fundamental mechanisms of aging in order to develop therapeutics that target aging. This is performed with the use of a mouse model of a human progeroid syndrome or disease of accelerated aging. Aging is thought to be driven by time dependent accumulation of damage that causes cells to senesce. The burden of senescent cells increases with aging in mammals and these cells are very pro-inflammatory. Throughout this study, multiple drugs that target senescent cells were compared to determine their effectiveness at reducing senescence and increasing healthspan of the mice. The mice were imaged to measure senescence using a p16-luciferase reporter and health evaluations were performed weekly to assess the rate of aging. Drug A caused a significant decrease in senescence compared to the control. Drug B caused no change between the drug treated mice or vehicle control mice. Further studies optimizing drug dose and treatment timing are necessary. Drug C yielded data that trended towards a reduction in senescence. Perhaps using a larger sample size would yield a significant effect. Drug

D after the first dose had increased symptoms of aging and a significant effect on the health in a negative manner after the second dose. Perhaps the mice are experiencing drug toxicity and maybe a lower dose could have a biological benefit. These preliminary data suggest that drugs which target senescent cells work *in vivo* to clear senescent cells and might be optimized to extend healthspan.

Poster #63

Algae Bloom in St. Lucie Watershed: A Critical Chemical Evaluation of Nitrate in Source Waters

Emily Mirkin[1, 2], Rina Dukor[2], PhD, and Teresa Thornton[2]
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Abstract

Lake Okeechobee is a huge focal source point in this project because it contains a high amount of nitrate, about 40 parts per billion (PPb). The Kissimmee River goes through major farmland which contributes to the nitrate buildup in Lake Okeechobee. Lake Okeechobee releases water east and west: 40% (up to 1.2B gallons/day) goes east into St. Lucie River and 60% (up to 2.6B gallons/day) goes west into Caloosahatchee River. This project will determine nitrate concentrations, detect sucralose, and identify toxins to determine the blue-green algae species in our source waters. The project will be divided into 3 phases. Phase 1: The Nitrate phase, will be focused on nitrate concentrations in source waters around the St. Lucie watershed in Stuart. To cover a large area, students from schools in the targeted area will be collecting water samples from source waters near their homes and using Dr. Thornton's nitrate test kits. Phase 2: The Sucralose phase, will be focusing on detecting the presence of sucralose in the water samples collected in phase one. Sucralose (Splenda) is an artificial sweetener, because most of sucralose cannot be broken down and is instead excreted as waste. This waste passes through wastewater treatment systems non-degraded becoming a part of our drinking water supply. Phase 3: The Blue-Green Algae phase, will be focusing on identifying the species of blue-green algae after determining types of toxins present in the water, if present. Algae blooms can contain potent cyanotoxins, problematic for aquatic life and people.

Poster #64

From time series to brain networks: analysis of brain network dynamics in case of epilepsy

Natasha Astudillo, Manuel Garcia-Russo, and David Quesada, Ph.D.
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Abstract

Mapping brain regions responsible for pathological behaviors of the central nervous system is one of the areas of major interest in translational medicine, brain connector project and network medicine nowadays. In this sense, the concept of brain networks has emerged as one of the most fascinating applications of graph theory and complex networks to address medical problems involving the interaction of many agents. This communication is aimed at presenting the application of the above ideas to understand the genesis of epilepsy as well as to elaborate

recommendations, surgeons might use while deciding when and where to dissect during surgical procedures related to epileptogenic incidents out of control. By using the capabilities provided by Mathematica 10.4 to deal with networks and time series analysis, data obtained from EEG measurements are analyzed and mapped into a network. Variability's within obtained network - measurement batches are computed and some predictions are advanced in terms of network features. Additionally, two types of mathematical models are solved, the FiztHugh - Nagumo and the Kuramoto model operating on a network. The former accounts for the behavior of a group of neurons within a particular cortical region of the brain, while the second is used to account for the synchronicity between different regions within the Temporal Lobes, where epileptic focal points use to be localized.

Poster #65

The role of CSPGs in neuronal differentiation of stem cells from the adult zebrafish brainstem

Raul Banos[1], Andrea Solano[1], Rayshell Sands[1], Stephanie Mangels[1], Martin Oudega, Ph.D.[2], and Jeffery Plunkett, Ph.D.[1] [1]St. Thomas University, Miami Gardens, FL; [2]University of Miami Miller School of Medicine, Miami, FL

Abstract

In the mammalian central nervous system (CNS), neurons fail to regenerate their axon after injury due at least in part to the presence of growth-inhibitory molecules such as chondroitin sulfate proteoglycans (CSPGs). However, in adult zebrafish (*Danio rerio*) certain CNS neuron populations regenerate their axon after an injury in the presence of CSPGs. To investigate the axonal growth response of zebrafish brainstem neurons in the presence of CSPGs, we developed and characterized a unique primary culture system. This heterotypic culture contains neurons, glia, and stem/progenitor cells. Our preliminary *in vitro* data showed the presence of distinct populations of stem cell-derived neural progenitor cell populations that can differentiate into mature neurons and extend processes into CSPG-rich terrains. In the present study, we investigated a potential role for CSPGs in the differentiation of adult zebrafish brainstem-derived stem cells into neurons. We hypothesized that CSPGs promote the differentiation of stem cells into neurons to enable CNS repair. Using our unique culture system, we examined whether specific concentrations of CSPGs combined with laminin as a growth-promoting substrate play a role in the degree of neuronal differentiation seen after 7 days in culture. Cellular/morphological analysis of CSPG/laminin substrate cultures revealed a more prominent neuronal-like differentiation pattern when compared to a laminin alone substrate condition. Furthermore, immunocytochemical and statistical analysis revealed a phenotypic and quantitative basis for better understanding of the roles of CSPGs and stem cells in CNS regeneration as seen in teleost fishes.

Poster #66

Contrasting effects of aqueous vermicompost extract mixtures on growth of *Brassica oleracea* var. *sabellica*

Luis Cendan, Carlos Vazquez, Dora Pilar Maul, Ph.D.
St. Thomas University, Miami Gardens, FL

Abstract

Organic fertilizers not only maintain soil fertility but enhance the biological activity of the soil, which improve the efficiency of nutrient use by the plants. Vermicompost, a nutrient-rich organic fertilizer made by composting earthworms can be used in the preparation of aqueous extracts known to increase crop yield and plant health. Vermicompost was produced through cultivation of Red Wriggler worms (*Eisenia fetida*), a common composting species and used in the preparation of aqueous fertilizing mixtures. Kale (*Brassica oleracea* var. *sabellica*), a leafy vegetable known for its high nutritional properties, was grown in the STU organic garden in the spring of 2016. Plants were fertilized with one of three vermicompost-based solutions containing different combinations of organic additives, such as fish emulsion, corn syrup and/or a seaweed blend. Mixtures were prepared weekly and applied, in 4 gal. doses to the plants in each study group twice a week over the course of 10 weeks. Upon harvest, the height, wet weight, and dry weight of the plants were measured. ANOVA and Tukey test analysis showed a significant positive effect on all vermicompost-treated plants compared to the control. Kale plants receiving the mixture T1 (a combination of vermicompost and fish emulsion) resulted in significantly greater height, wet weight, and dry weight in comparison to the other treatments.

Poster #67

Mighty fruits: Antioxidant performance of various fruits

Jennifer Cerda, Jason Alvarodiaz, Christine Curiac, and Luis C. Fernandez, Ph.D.
St. Thomas University, Miami Gardens, FL

Abstract

Antioxidants help fight free-radicals, which are produced by stress and later can induce many health problems. L-Ascorbic acid (Vitamin C) is a great antioxidant, and it can be found in a vast variety of fruits. Additionally, vitamin C is marketed as an over-the-counter remedy for the common cold. This motivates our desire to understand vitamin C's antioxidant properties. This investigation presents the antioxidant capacity of various fruits that are known to be sources of vitamin C, and their comparison to pure vitamin C using the Briggs-Rauscher (BR) oscillatory reaction. The antioxidant species scavenge free radicals formed in the BR reaction, lengthening the time intervals of the reaction's oscillations; the higher the antioxidant capacity, the longer the oscillation delays. The samples that were tested were: L- Ascorbic acid, Sunny-D®, red grape juice, white grape juice, pineapple juice with pulp, pineapple juice without pulp, mango juice, and kiwi juice. Pure vitamin C could only be tested at low concentrations, as high concentrations completely interrupt the BR reaction. Kiwi exhibited the best antioxidant capacity of the tested samples, followed by mango juice. The antioxidant performance of orange juice resembled that of vitamin C the most. This result suggests that vitamin C is the main antioxidant present in orange

juice. The other fruits exhibited antioxidant performances different to pure vitamin C. We ascribe these observations to the presence of other molecules, such as flavonoids and tannins, which also show antioxidant capacity.

Poster #68

Comparing the differential expression of selected genes in native Peruvian potatoes in response to early and late drought conditions

Laynet Cornelio[1], Indira Perez[1], Carlos Vazquez[1], Diana Martinez[2], Olga Patricia Ponce[2], Emi Murata[2], Yerisf Torres[2], Luz Noemi Zuñiga, Ph.D.[3], Gisella Orjeda, Ph.D.[2], Dora Pilar Maul, Ph.D.[1], and Carlos Merino, Ph.D.[2]

[1]St. Thomas University, Miami Gardens, FL; [2]Universidad Peruana Cayetano Heredia, Lima, Perú;[3]Instituto Nacional de Innovación Agraria, Huancayo, Perú

Abstract

Plant response to drought stress comprises growth inhibition, stomatal closure, an increase in abscisic acid (ABA) biosynthesis and increased antioxidant metabolism, among others. Drought tolerance in plants is linked to photosynthesis and carbohydrate metabolism. Drought-inducible functional proteins include those that protect cells from water deficit and oxidation as well as transcription factors and signaling molecules associated with the water-stress response. Native potatoes from the Andean regions of Peru, Ecuador and Bolivia grow at altitudes as high as 11483 ft. (3500m) above sea level. Because of their high genetic diversity, they are well adapted to the harsh environmental conditions that prevail in the high Andes, including drought. This makes them ideal candidates for gene expression studies associated with drought tolerance. St. Thomas University is collaborating with the Universidad Peruana Cayetano Heredia (UPCH, Lima, Peru), and the Instituto Nacional de Innovacion Agraria (INIA, Huancayo, Peru) in a gene expression study in native potatoes associated with early and late drought responses. Selected drought-associated candidate genes from RNA-seq analysis were used in primer design and quantitative RT-PCR analysis. Differential gene expression in tolerant vs. susceptible cultivars has been confirmed for two heat shock proteins, a dehydration-response element binding protein and for a major pollen allergen.

Poster #69

Characterizing potential anticancer properties of the medicinal plant *Tradescantia spathacea*

Marrisa Lee, Milagros Mulero, Leana Ramos, Dora Pilar Maul, Ph.D., Maria Pina, Ph.D., and Alexis Tapanes-Castillo, Ph.D.

St. Thomas University, Miami Gardens, FL

Abstract

Natural products, isolated from plants, have been developed into numerous chemotherapeutic drugs and used my millions of patients for cancer treatment. Nevertheless, novel cancer therapies

that are more efficient and cause fewer severe side effects are urgently needed. Our aim is to isolate potential new anticancer compounds through bioassay-guided fractionation. The Oyster plant, *Tradescantia spathacea*, has traditionally been used for medicinal purposes. Teas, made from its leaves, are used as a home remedy for inflammation and microbial infection. Recent studies provide preliminary evidence that extracts derived from its leaves exhibit anticancer properties. The goal of this project is to test the effects of different Oyster plant extracts on MCF-7 breast cancer cells cultured *in vitro*. Plant leaf extracts of three distinct polarities (100% ethanol solvent; 75% ethanol-25% hexane solvent; and 50% ethanol-50% hexane solvent) were screened at a range of concentrations for cytotoxicity using a Methylthiazoletetrazolium (MTT) cell viability assay. Preliminary data from two independent experiments indicated no significant cytotoxicity in 20-200 μg/mL leaf extracts compared to untreated controls. Higher extract concentrations will be tested to determine optimal dosage for cell-invasion assays, which model metastatic processes.

Poster #70

Using human neural progenitor stem cells and gene silencing to study the role of DLGAP1 transcripts in autism

Milagros Mulero[1], Leana Ramos[1], Carlos Canales[1],
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Abstract

Altered neuronal communication is hypothesized to be an underlying cause of autism spectrum disorder (ASD). Recent transcriptome sequencing revealed three Discs large homolog-associated protein 1 (DLGAP1) transcripts are differentially expressed between cultured ASD and control, non-ASD human cortical neurons. DLGAP1 is a scaffolding protein, expressed in the post-synaptic density of glutamatergic neurons. The aim of our research is to examine the role of cell endogenous DLGAP1 antisense transcripts in autism biology. To accomplish this, we are culturing neural progenitor cells from ASD and control patients and differentiating the cells into glutamatergic neurons. Six lentiviruses, carrying different short hairpin RNAs (shRNAs) designed to reduce DLGAP1 antisense (AS) 1 and 2, were generated. Cells were transduced with a lentivirus targeting DLGAP1 AS1, DLGAP1 AS2, control scrambled shRNA, or control Green fluorescent protein (GFP). Procedures were established to amplify DLGAP1 antisense 1 and 2 cDNA in preparation for quantifying shRNA-mediated transcript reduction utilizing real-time reverse transcriptase PCR. Experiments are underway to examine the cellular morphology, differentiation, maturation, synaptic structure, and electrophysiology of lentivirus transduced and non-transduced ASD and non-ASD glutamatergic neurons. These data will provide valuable insight into the role of DLGAP1 antisense 1 and 2 in glutamatergic neurons during normal development and in autism biology.

Poster #71

Spectrophotometric iron determination in organic fertilizer-treated soil analyzed using 1-10 phenanthroline method

Kelly O'Reilly, Cristina Balistreri, Daniel Russo, Carlos Vazquez, Dora Pilar Maul, Ph.D., and Maria Pina, Ph.D.
St. Thomas University, Miami Gardens, FL

Abstract

Iron is present in two states of oxidation in the atmosphere: Fe^{+2} and Fe^{+3}. Iron is one of the crucial elements necessary for a plants' life and it is absorbed through the roots from the soil. It is utilized in the formation of chlorophyll and proteins and classified as a micronutrient in soil because it is not found in great concentration. Plants only need a small amount of iron to be healthy, but that small amount is crucial. Iron is involved when a plant produces chlorophyll, which gives the plant oxygen as well as its healthy green color. Iron deficiency can be corrected by adding to the soil a fertilizer rich in iron. The purpose of this experiment is to determine the amount of iron in different fertilized soil samples and analyze them using spectrophotometric methods. Fe^{+2} strongly reacts with 1-10 phenanthroline solution and forms an orange colored complex. The absorbance was measured in 1 cm optical pathlength cells at 510 nm against blank test as reference. The original samples of soil were collected from St. Thomas University's Organic Garden. The soil samples derived from different pots of Okinawan Spinach plants contained fertilizers such as fish oil, bone meal or vermicompost, and pots without fertilizers. The concentration of total iron varies between 54.30-83.30 ug/g. The fish fertilizer has the highest iron content and bone meal fertlizer the lowest.

Poster #72

Antioxidant capacity of selected teas and cocoa

Kasey Rivera, James Hankemeyer, Kelnisha Lightbourne, Sara Salamah, and Luis C. Fernandez, Ph.D.
St. Thomas University, Miami Gardens, FL

Abstract

Diverse teas are consumed around the world for their calming, soothing effects. Many people attribute curative properties to tea. The same can be said for cocoa, and its processed form chocolate. Furthermore, these attributed health-giving properties are suggested to come from their antioxidant properties. This study presents the determination of the antioxidant capacity of selected teas (*Camellia sinensis*) and cocoa (*Theobroma cacao*), and comparing those results to a caffeine standard. The Briggs-Rauscher (BR) oscillating reaction was used to determine the antioxidant capacity of the samples. The antioxidant species scavenge free radicals formed in the BR reaction, lengthening the time intervals of the reaction's oscillations; the higher the antioxidant capacity, the longer the oscillation delays. The samples consisted of aqueous preparations of Green tea, Black tea, Cocoa (pure powder), and Dark chocolate. To analyze the results we used the Relative Antioxidant Performance (RAP), where the slopes of the samples were compared to the caffeine standard. We hypothesized that the aqueous preparations of the samples would exhibit antioxidant capacity. Our hypothesis was proven correct, with green tea showing consistently higher RAP than decaffeinated green tea, and dark chocolate exhibiting slightly more antioxidant capacity than pure cocoa powder. Black tea proved to be less antioxidant than green tea. These

observations suggest that antioxidant properties are present, and could be a plausible pathway to their attributed health-giving properties. Finally, these preparations are complex mixtures of natural ingredients; therefore, we should not dismiss any potential synergistic effects between different ingredients.

Poster #73

Analysis of Oyster plant (*Tradescantia spathacea*) extracts via maceration, Soxhlet extraction and thin layer chromatography

Daniel Russo, Cristina Balistreri, Dora Pilar Maul, Ph.D., and Maria Pina, Ph.D.
St. Thomas University, Miami Gardens, FL

Abstract

The purpose of the present study is the analysis of the Oyster plant extracts using different methods. The Oyster plant (*Tradescantia spathacea*) is a fleshy or succulent perennial garden herb. It is utilized for ornamental purposes in many tropical and subtropical climates. Medicinally, the plant is used for colds, sore throat, whooping cough, nasal bleeding, and also as an anti-inflammatory. Oyster plants were grown and harvested from the organic garden at St. Thomas University. The different parts of each plant – leaves, stems, roots and flowers – were separated, cleaned, and dried at 40°C. Specimens were then grinded and prepared as extracts using maceration and Soxhlet extraction. All the extracts were rotevapored and analyzed by thin layer chromatography (TLC) with different mixtures of polar and nonpolar solvents. The spots were developed and visualized with iodine and UV light. Root and leaf fractions contained the majority of organic compounds. The present work reports the best solvent for extraction and the most effective conditions for TLC separation.

Poster #74

Disruption of the Wnt and Hippo signaling pathways by pharmacological agents results in developmental defects in the sea urchin embryo

Claudia Cabrera, Karen E. Bates, and Athula Wikramanayake
University of Miami, Coral Gables, FL 33146

Animal-vegetal (AV) axis patterning and germ layer specification are important developmental events for body plan organization. The Wnt/ß-catenin signaling pathway is one of the mechanisms that direct these events. In sea urchin embryos, this pathway is activated at the vegetal pole resulting in the specification of endomesoderm and formation of the gut. The Hippo pathway specializes in regulating tissue growth and organ size. In this project, *Lytechinus variegatus* embryos were treated with pharmacological agents that inhibit components of the Wnt or Hippo pathways, and examined for loss-of-function (LOF) phenotypes. We hypothesized that drugs that disrupt the Wnt and Hippo signaling pathways will disrupt AV axis patterning and gut formation in sea urchin embryos. LOF phenotypes that were observed in drug-treated embryos included expanded guts (LiCl and GSK3 inhibitor) and reduced guts (Wnt-c59 and verteporfin). To test for potential interactions of Wnt and Hippo pathway components, embryos were exposed to two drugs that resulted in phenotypes when embryos were singly treated. Embryos treated with LiCl and Wnt-c59, which target Wnt pathway components, had a reduced gut suggesting that the LiCl gut phenotype is dependent on the presence of the Wnt ligand. When embryos were doubly treated

with GSK3 inhibitor (Wnt) and Verteporfin (Hippo), a reduced gut was observed suggesting that the GSK3 gut phenotype is dependent on YAP/TEAD interactions in the Hippo pathway. This result suggests that Hippo pathway components may regulate Wnt signaling in AV axis patterning and gut formation in the sea urchin.

Poster #75

Exercise as a therapeutic approach against Methamphetamine and HIV-1 induced neurodegeneration

Dilraj Cambow, Harry Levine, Ernest Barral, Minseon Park, Ph.D., Michal Toborek, M.D. Ph.D.

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Abstract

Throughout the last decades, there has been an increase in the incidence of HIV infections among methamphetamine (METH) abusers. It has been shown that HIV-positive METH users exhibit more severe neurological complications than non-users. However, there are no therapeutic interventions available to treat these complications. The present study focuses on the effects of exercising as a potential therapy for HIV/METH-induced neurotoxicity. This study was based on a chronic exposure to METH (5 days with escalating doses at 3 h intervals), followed by EcoHIV infusion into C57BL/6J mouse brain. EcoHIV is a derivative of HIV-1 that contains a substitution of envelope protein gp120 with that of gp80 derived from murine leukemia virus-1 (MuLV-1), which infects only murine cells, with no effect on human cells. One group of mice was subjected to a 4-week voluntary wheel-running exercise regime, while the control group of mice was housed with a fixed wheel. Subsequently, both groups were subjected to a new object recognition test to evaluate cognitive skills and then sacrificed to collect brains. Treatment with METH and EcoHIV was found to affect the mice's ability to discriminate between noble and familiar objects, a sign of neurodegeneration and decreased memory retention. Elevated astrocyte activation was also observed, through analysis of GFAP levels. Exercise was shown to improve the memory retention, and lower astrocyte activation of treated mice. These results suggest that exercise can protect against the neurocognitive dysfunction prompted by METH and HIV-1, possibly by reducing the induced neurotoxic environment.

Poster #76

Assembly of mitochondrial supercomplexes in the yeast *Saccharomyces cerevisiae*

Zoe Cosner, Antonio Barrientos and Flavia Fontanesi

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Abstract

The mitochondrial oxidative phosphorylation system, composed of the mitochondrial respiratory chain (MRC) and ATP synthase, generates most cellular energy in the form of ATP molecules. The MRC is formed by four multimeric enzymes (complex I-IV) embedded in the mitochondrial inner membrane and two electron carriers. MRC complexes form ordered structures called supercomplexes, which are proposed to enhance individual complex stability and increase respiratory efficiency. Despite their importance, supercomplex assembly remains poorly

understood. Observations in yeast and mammalian cells have suggested that structural subunits of different complexes may interact in subassembly intermediates. We hypothesize that supercomplexes do not originate from the association of preassembled individual complexes. Rather, their biogenesis involves incorporation of partially assembled complexes and free subunits into subassembly intermediates of increasing complexity. In the yeast *Saccharomyces cerevisiae* supercomplexes are composed of a complex-III dimer and one or two complex-IV monomers. We have engineered a system that enables us to halt specific MRC subunits expression and restore it at any moment after the MRC enzymes have been turned over, facilitating the study of MRC supercomplex assembly pathway/s *de novo*. Our initial data shows that some CIII and CIV subunits are incorporated directly into supercomplexes in late assembly stages, while others accumulate in earlier subassemblies, which could represent supercomplex assembly intermediates. Additionally, we have generated yeast strains expressing CIII-CIV subunit fusions. Notably, these cells assemble covalently linked mitochondrial supercomplexes capable of respiring.

Poster #77

Affinity of Carbon Nanoparticles (Carbon Dots) to Bone and Efficacy of the conjugation of Carbon Dots to act as Drug Carriers

Esmail Miyanji, Zhili Peng, Yiqun Zhou, Isaac Skromne Ph.D., and Roger Leblanc Ph.D.
University of Miami, Miami, Fl.

Abstract

Carbon nanoparticles have potentially numerous biomedical applications such as fluorescence imaging techniques and as organic biomaterial. In published work we have shown that carbon nanoparticles less than 10nm synthesized from carbon nano powder are fluorescent and, upon injection into zebrafish embryos, bind with high affinity and specificity to bones (Li, et al 2016). These properties could be exploited for the development of novel bone imaging and drug delivery technologies for precision treatment of bone diseases such as osteoporosis. These alternative treatments would specifically target drugs to bone and, in this way avoid secondary physiological effects. While we currently know that carbon dots bind to bone, we do not know if and how toxic they are to animals, and whether chemical modifications to load drugs to them would change their bone binding properties. Here we show that carbon dots are non-toxic and well tolerated by embryos. We also show that carbon dots synthesized from carbon nano powder are unique in their ability to bind bone, and that this property does not change if the carbon dots are functionalized with amine or carboxyl groups. In contrast, carbon dots synthesized from other materials do not show bone-binding properties. Our data supports the potential of carbon dots to act as specific drug carriers to bones.

Poster #78

Design and evaluation of fibrin gels for the controlled local delivery of regulatory proteins

Divya Sha, Freddy Gonzalez, and Alice Tomei, Ph.D.
Department of Biomedical Engineering, University of Miami, Coral Gables, FL

Abstract

We showed that CCL21 secretion induces the formation of a tolerogenic environment that promotes tumor immune escape and survival when CCL21 is expressed in cancer cells and that prevents autoimmune diabetes when CCL21 is expressed in pancreatic β-cells. We found that as early as four weeks of age (Non-Obese Diabetic) NOD mice engineered to express CCL21 under their insulin promoter (NOD-CCL21) developed tertiary lymphoid organs (TLOs) in their pancreas and those TLOs contain lymphoid stromal cells (LSCs). LSCs from lymph nodes can mediate self-tolerance by deleting autoreactive T cells. We hypothesize that CCL21-induced TLOs protect β-cells from destruction by autoreactive T-cells through antigen presentation by LSCs. We aim at translating these findings into a clinically applicable biomaterial platform. We hypothesize that we can induce formation of TLOs containing tolerogenic LSCs by implanting CCL21-releasing hydrogels together with β cell antigen-releasing hydrogels that will provide LSCs with the antigens to tolerize. We designed fibrin gels and started optimizing their degradation profile. We verified that a physiological level of plasmin of 0.01 U/mL allowed fibrin degradation to occur within two days, similarly to *in vivo* gel degradation. On the other hand, using a protease inhibitor, aprotinin, we increased the longevity of the gel to 3-9 days, which is more suitable for delivery of CCL21 and β cell antigens. When we incorporated CCL21 in the gels, we found gradual CCL21 release with gel degradation. Next, we will implant the CCL21-releasing gels into pre-diabetic NOD mice, and analyze cell recruitment by flow cytometry and histology.

Poster #79

Novel Therapies Used to Target the Metabolic Pathway of Glioblastoma

Frederic A. Vallejo, Nicolas De Cordoba, Wanda A. Gonzalez, Denis A. Ortega Ioni, Winston M. Walters, Scott Raskin, Ricardo J. Komotar, Steven Vanni and Regina M. Graham
Department of Neurosurgery, University of Miami, Coral Cables, FL

Abstract

Introduction. Glioblastoma (GBM) is a lethal primary malignant brain tumor. Cancer cells demonstrate increased dependence on glucose when juxtaposed with normal cells. Both Ketogenic diet (KD) and the diabetic drug Metformin (MET) lower blood glucose level and have exhibited anti-cancerous effects. Here we sought to investigate the individual and combined effects of metformin (MET), ketone bodies, and glycolytic inhibition on GBM cells. **Methods**. Adult patient derived GBM stem-like cells (GSCs) Glio9, non-stem cell U87 (adult) and SJGBM2 (pediatric) GBM cells were treated with MET (0-8mM), glycolytic inhibitor 2-deoxy-D-glucose (2-DG:0-4mM), or ketone bodies: acetoacetate (AA), and beta-hydroxybutyrate (bHB) (0-20mM each) and cell viability determined via MTS assay. Effect of AA (0-10mM) on GSC self-renewal was evaluated in GSC lines Glio3 and Glio38 by neurosphere forming assays. **Results**. 2-DG induced a dose dependent decrease in viability in all cell lines. MET had no effect on GBM cell lines but pre-treatment with 1mM MET, sensitized GBM cells to 2-DG's cytotoxic effect (reducing viability additional 50% over 2-DG alone). While bHB had no effect on cytotoxicity, AA significantly reduced viability at 5mM in all cell lines. Combined AA and 2-DG treatment exhibited an additive

cytotoxic effect. Furthermore, AA significantly reduced GSC neurosphere formation at concentrations as low as 2.5mM. **Discussion**. Our data indicates that biologically realistic concentrations of AA induce anti-cancer effects in GBM. MET sensitized GBM cells to 2-DG suggesting a synergistic response. Therefore, GBM patients might benefit from combined metformin and glycolytic inhibitor treatment or alternatively combined AA and glycolytic inhibitor treatment.

Poster #80

Optogentic Control of Grooming in Drosophila Melanogaster

Eamonn Byrnes, Seth Tomchik Ph.D., Lanikea King, Ph.D.
The Scripps Research Institute, Jupiter, Fl., Florida Atlantic University, Jupiter, Fl.

Abstract

Neurofibromatosis type 1 (NF1) is a commonly inherited neurodevelopmental disorder characterized by benign nervous system tumors, hyperactivity, cognitive impairment, and other complications. NF1 affects ~1/3,500 individuals worldwide, is an inhibitor of the Ras oncogene, and influences multiple upstream and downstream signaling cascades. By studying the behavioral effects of NF1 knockdown it is possible to understand how neurons are affected on a cellular level. Drosophila have an NF1 gene with 60% amino acid homology to humans, and experience similar adverse behavioral effects when NF1 is mutated. Previously it was observed that knockdown of NF1 caused increased activity levels and grooming in Drosophila up to 7x. By optogenitacally expressing red-shifted channel rhodopsin, CsCrimson, in NF1 knockdown subjects it is possible to trigger grooming with the advent of crimson light. Through this method, a positive control is established, and experimental error is diminished. Drosophila follow a specific hierarchy of grooming in which specific body parts are groomed before others. Front legs are groomed first, then the head, hind legs, abdomen, and wings. Grooming of a higher order body part suppresses grooming in lower order body parts. Locomotor behaviors were studied in NF1 knockdown flies using video analysis and infrared activity monitors. Overall, loss of NF1 results in increased activity and grooming. This provides a platform to study the molecular genetics neurofibromin signaling in neuronal circuits.

LSSF STEM Research Symposium 2017 Judges

Judges play a vital role in the success of the LSSF Symposium and for that reason we express our sincere gratitude for their contributions.

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LSSF STEM Research Symposium 2017 Tabling

Thank you to the institutions who tabled at the LSSF Symposium. Providing resources and knowledge about next steps in academic careers to our undergraduate students is invaluable.

Barry University Graduate Programs

Florida International University Graduate Programs

Palm Beach State College Biotechnology Program

St. Thomas University Graduate Programs

LSSF STEM Research Symposium 2017 Committee

Life Sciences South Florida would like to extend their appreciation to the internal committee that served to create the symposium, define its characteristics and join our region's undergraduate student researchers together in a meaningful and highly productive program.

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A huge thank you to Palm Beach State College for hosting the Fifth Annual LSSF Symposium this year! A special recognition to PBSC's Dr. Becky Mercer and Dr. Alexandra Gorgevska for their dedication to ensuring an excellent event for our students.

LSSF STEM Research Symposium 2017 Palm Beach State College Internal Committee

Life Sciences South Florida would like to extend their appreciation and thanks to the internal Palm Beach State College committee that served to create the symposium, define its characteristics and join our region's undergraduate student researchers together in a meaningful and highly productive program.

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We would also like to extend a very special thank you to all of the student volunteers from the Biotechnology Student Association, Dr. Gorgevska's Chemistry classes, and to PBSC student Abigail Taylor that helped make this event a success.

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