Interdisciplinary Research Conference

Focus on Your Future

The Interdisciplinary Research Conference was developed to recognize the scholarship of students and faculty in all disciplines. It provides our undergraduate and graduate students and faculty with the opportunity to present their scholarly work to the campus community. In this context, research is interpreted as any scholarly or creative activity ranging from scientific experimentation to artistic expressions, service-learning, literary criticism, or case-study designs.

The conference was designed to facilitate the exchange of ideas among all fields of inquiry, encourage scholarly investigation, and foster the educational function of research, broadly defined.

The theme, Focus on Your Future, was incorporated to provide students with an opportunity to use their scholarly work as leverage in exploring future career possibilities.

Conference Opening Session

Wednesday, March 30, 2016
Lassiter Rotunda – Warren Library
11 a.m. to Noon

Welcome and Opening Prayer

Dr. Gene C. Fant, Jr.
Provost and Chief Academic Officer

Dr. Thomas J. St. Antoine
School of Communication and Media
Director, Frederick M. Supper Honors Program

Dr. Justin D. Barnard
Associate Dean, Institute for Intellectual Discipleship, Union University

Introduction of the Keynote Speaker

Keynote Speaker

Refreshments will be served on the Yeager Patio immediately following the opening session.

A complimentary copy of Enlightening Minds: Research Review 2015 is available at the conference registration table.
Justin D. Barnard, Ph.D., is associate dean in the Institute for Intellectual Discipleship and associate professor of philosophy in the Honors Community at Union University in Jackson, Tennessee.

In the area of bioethics, Dr. Barnard is the primary instructor and designer of a course in pharmacy ethics for second-year Pharm.D. students in Union University’s School of Pharmacy. Dr. Barnard has published in the areas of philosophy of religion and the philosophical legacy of C.S. Lewis. He was recently a contributor to the Respectful Conversations project on the future of evangelicalism and he occasionally muses for “Evangelogia” — a blog for the Institute for Intellectual Discipleship that he directs.

Dr. Barnard sponsors extensive programming in bioethics at Union University and in West Tennessee, hosting events on such topics as technology and culture, death and dying, and the ethics of organ donation. He has spoken to academic and lay audiences, including local radio and television interviews, on such topics as rights of conscience, disability and social justice, moral complicity, and human cloning. In addition, Dr. Barnard has published essays on such topics as human embryonic stem cell research, cognitive enhancement, genetic enhancement, and neuroethics for Public Discourse — a journal of ethics, law, and the common good produced by The Witherspoon Institute at Princeton University.

Prior to his appointment at Union, Dr. Barnard was an assistant professor of philosophy at Crichton College in Memphis, Tennessee, where, from 2005-2007 he served as dean of the School of Arts and Sciences. From 2002-2004, Dr. Barnard was a lecturer in the Department of Philosophy at Messiah College in Grantham, Pennsylvania. Dr. Barnard holds a Bachelor of Arts degree in philosophy and religion from Palm Beach Atlantic University in 1996; he holds an M.A. and Ph.D. in philosophy from Florida State University.

Dr. Barnard is the recipient of the 2012-13 Carla D. Sanderson Faculty of the Year award at Union University. He and his wife, Tracie, have two sons. They are members of First Baptist Church in Jackson, Tennessee.
Student and Faculty Poster Presentations

Lassiter Rotunda – Warren Library
Wednesday, March 30, 2016   Noon – 1 p.m.

Erika Barajas, Marine Biology major; and Dr. Cidya Grant, Assistant Professor of Chemistry, School of Arts and Sciences. “Identification of Bioactive Fraction CGMA03 from Seeds of Annonaceae.”  (p. 12)

Alejandro Castaneda, Exercise Science major, School of Education and Behavioral Studies. “Carbohydrate Ingestion on Hydration Status and VO2 Kinetics During Maximal Exercise Testing.” (p. 12)

Dr. Elias Chahine, Associate Professor of Pharmacy Practice; Dr. Anne Harring, part-time Assistant Professor of Pharmacy Practice; and Nick Palm, Pharmacy major, Lloyd L. Gregory School of Pharmacy. “Implementing and Assessing School-Wide Objective Structured Clinical Examinations: A Pilot Study.” (p. 12)

Dr. Thomas C. Chesnes, Associate Professor of Biology; Joshua Holbrook, Biology major ’09, School of Arts and Sciences. “Herpetofaunal Survey of an Appalachian Cavern System.” (p. 12)

Dr. Thomas C. Chesnes, Associate Professor of Biology; Morgan Belle, Reana De Pass, and Trinity Livingston, Biology majors, School of Arts and Sciences; Shawn McCally, Gale Academy of Environmental Science, Forest Hill High School. “Public Perception of the Ecological Value of Coastal Organisms in Palm Beach County, Florida.” (p. 12)

Juleah Cintron, Human Performance and Sport major, School of Education and Behavioral Studies. “Correlation of Overall Fitness and Indicators of Depression in College Freshman.” (p. 13)

Dr. Sanaz Dovell, Assistant Professor of Chemistry; Dr. Vanessa Rowan, Assistant Professor of Biology; Taylor Anderson, Medical and Biological Chemistry major; and Emily Ruple, Molecular Biology major, School of Arts and Sciences. “Antimicrobial Effects of Essential Oils on Infectious Bacteria.” (p. 13)

Samantha Gray and Alejandro Castaneda, Exercise Science majors; and Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance, School of Education and Behavioral Studies. “Palmar Cooling and Perceived Soreness in Varied Athlete Groups.” (p. 13)

Lesslee Hernandez and Grace Patterson, Exercise Science majors; and Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance, School of Education and Behavioral Studies. “Hemoglobin Mass and Maximal Aerobic Capacity in College Freshman During the Competitive Women’s Soccer Season.” (p. 13)

Dr. Velma Lee, Associate Professor of Management, Rinker School of Business; Dr. Ken Pembamoto, Associate Professor of Computer Science; Austin Kostelansky and Kyle Kostelansky, Computer Science majors, School of Arts and Sciences. “Developing a Simulation Approach to Testing Sustainability.” (p. 13)

Friederike S. Luetzenberg and Esther Rodriguez, Counseling majors; David M. Compton, Professor of Psychology, School of Education and Behavioral Studies. “Tripping the Light Fantastic: Modelling the Consequences of Recreational Use of MDMA or 5-MeO-DiPT in Humans Using Weekend ‘Rave’ Exposures.” (p. 13)

Kayla Mendez, Medicinal and Biological Chemistry major; Kiyoshi Takeda, Hisako Kayama, Mark Sundrud, “Bile Acid Biosynthesis of Intestinal Dendritic Cells.” (p. 14)

Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance; Denise Breitkreuz, Assistant Professor of Health and Human Performance; Grace Patterson and Juleah Cintron, Exercise Science majors; Sara Orbe and Cody DeBoer, Human Performance and Sport major, School of Education and Behavioral Studies. “A Descriptive Analysis of Health and Wellness in HHP 1061 Lifetime Fitness Students.” (p. 14)

Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance; Dr. Stephen Sylvester, Assistant Professor of Health and Human Performance; and Sara Orbe and Cody DeBoer, Health and Human Performance majors, School of Education and Behavioral Studies. “Electrocardiographic Changes Found During Graded Exercise Testing in Cancer Patients.” (p. 14)

William F. Patterson III, David Hollander, Greg Ellis, Ethan Goddard, Stephanie Mambelli, Biology majors, School of Arts and Sciences. “Assessing Facultative Herbivory in a Marine Omnivore with Compound-Specific Stable Isotope Analysis.” (p. 14)

Dr. Ken Pembamoto, Associate Professor of Computer Science; Caleb Panza and Matt Rothenberger, Computer Science majors; School of Arts and Sciences. “On Building an Extremely-Large Number Calculator.” (p. 14)

Andrea Romanowski, Molecular Biology major; Megan Bruinius, Biology Pre-Health Professional major; and Dr. Mireille J. Aleman, Associate Professor of Chemistry, School of Arts and Sciences. “Investigation of the Effects of GCMA Extracts and GCMA03 Fraction on Various Triple Negative Breast Cancer Cell Lines.” (p. 15)

Andrea Romanowski, Molecular Biology major; Megan Bruinius, Biology Pre-Health Professional major; and Dr. Mireille J. Aleman, Associate Professor of Chemistry, School of Arts and Sciences. “Investigation of the Molecular Pathways Involved in the Induction of Apoptosis in GCMA03 Treated Breast Cancer Cells.” (p. 15)

Peggy VanArman, Professor of Biology; Keegan Baldock, Medicinal and Biological Chemistry major; Isabelle George, Katherine Harvey, Kyle Holly, Samantha Loutzenhiser, and Luke Young, Biology majors, School of Arts and Sciences. “Nutrients in Leaves of Pond Apple Trees (Annona Glabra) and Surrounding Soil and Water in Cypress-Pond Apple Swamps in the Northern Everglades.” (p. 15)
2015-2016 Conference Schedule

Student and Faculty Presentations
1 p.m. to 4:30 p.m.
Wednesday, March 30

Science and Health Care Track
Hanley Classroom (Room 115)

1 p.m.
Paul Jackson, Pharmacy major; Dr. Harm Maarsingh, Associate Professor of Pharmaceutical Sciences, Lloyd L. Gregory School of Pharmacy. “Anti-Allergic Effects by Arginase Inhibitors: Role of Histamine.”

1:30 p.m.
Paul Jackson, Pharmacy major, Lloyd L. Gregory School of Pharmacy. “Apoptotic Effects of Quinones on Breast Cancer Cells.”

2 p.m.
Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance, School of Education and Behavioral Studies. “Mechanisms Related to Exercise-Induced Reductions in Cancer-Related Fatigue - an 8 Week Exercise Program.”

2:30 p.m.
Nick Palm, Pharmacy major, Lloyd L. Gregory School of Pharmacy. “Implementing and Assessing School-Wide Objective Structured Clinical Examinations: A Pilot Study.”

3 p.m.
Allan Voiron, International Business major; and Ben Colabella, Accounting major, Rinker School of Business. “Wealth and Riches.”

3:30 p.m.
Dr. Sanaz Dovell, Assistant Professor of Chemistry, School of Arts and Sciences. “Antimicrobial Effects of Essential Oils on Infectious Bacteria.”

4 p.m.
Dr. Steven Vensel, Assistant Professor of Counseling, School of Education and Behavioral Studies. “Mobbing, Burnout and Religious Coping styles Among Protestant Clergy: A Structural Equation Model and its Implication for Counselors.”

Liberal Arts and the Social Sciences Track
Warren Library (Room 208)

1 p.m.
Dr. Paul Copan, Professor of Philosophy Ethics, The Pledger Chair, School of Ministry. “Ethical Considerations Regarding Beginning of Life Issues.”

2 p.m.
Dr. Randy Richards, Dean and Professor of Biblical Studies, School of Ministry. “Paul Behaving Badly: Reflections on How Society Views the Apostle Paul.”

2:30 p.m.
Kevin Boyle, Biblical and Theological Studies Major, School of Ministry. “The Location of Jesus’ Feeding of the Five Thousand: The Biblical Witness.”

3 p.m.
Rebecca Ethridge, English major, School of Arts and Sciences. “Reaching the Four Corners – Writing Center Space Across Campus.”

3:30 p.m.

4 p.m.
Dr. Jim Laub, Professor of Leadership Studies, MacArthur School of Leadership. “Measure What You Value: A Review of Servant Leadership Research using the Organizational Leadership Assessment (OLA).”
2015-2016 Conference Schedule

Student and Faculty Presentations
1 p.m. to 4:30 p.m.

Thursday, March 31

Science and Health Care Track
Hanley Classroom (Room 115)

1 p.m.
**Dr. Tom Chesnes**, Associate Professor of Biology, School of Arts and Sciences. “Research...PBA style.”

1:30 p.m.
**Dr. Deborah Morgan**, Associate Professor of Nursing, School of Nursing. “Implications for Promoting Self-Caring Behaviors Within the Undergraduate Nursing Curriculum.”

2 p.m.
**Erin Tierney**, Mathematics major, School of Arts and Sciences. “Study of Mean Reaction Time of Bimolecular Reactions in Two Dimensional RDME Systems.”

2:30 p.m.

3 p.m.
**Korey Bricker**, Nursing major, School of Nursing. “The Use of Aromatherapy to Increase Sexuality in Post Menopausal Women.”

3:30 p.m.
**Dr. Sandra Szegedi**, Associate Professor of Chemistry, School of Arts and Sciences. “Purification of a Protein Segment Involved in Many Types of Leukemia.”

4 p.m.
**Amy Meisha**, History major, School of Arts and Sciences; **Dr. Angie McDonald**, Associate Professor of Psychology; and **Tiffany Steele** and **Noah Cardillo**, Psychology majors, School of Education and Behavioral Studies. “The Digital Disease: Technology and the Influence on Marriage and Family.”

Liberal Arts and the Social Sciences Track
Warren Library (Room 208)

1 p.m.
**Dr. Kathleen Klein**, Professor of Dance, School of Music and Fine Arts. “University of Roehampton Dance: A Summary of Findings.”

1:30 p.m.
**Jeremiah Clarke**, Pre-Law major; **Dr. James Todd**, Assistant Professor of Politics, School of Arts and Sciences. “Unmanned Drones in U.S. Antiterrorism Policy Since 9/11.”

2 p.m.
**Lisa Marzano**, Assistant Professor of English and Director of Writing Programs, School of Arts and Sciences. “What if Atticus Finch is Wrong? Palliative Memory and Racial Discourse.”

2:30 p.m.
**Kurt Burghardt**, English major. “Dadaism and Christianity.”
**Thomas Lubben**, English major. “Where Infinity Stops.”

3:30 p.m.
**Dr. David Horkott**, Associate Professor of Philosophy, School of Arts and Sciences. “It’s a Zoo Out There: Findings About Learning Outside of the Classroom.”

4 p.m.
**Jordyn Marlin**, History major, School of Arts and Sciences. “The Condemned Dead: A Look at the Tradition of Irish Cillín Burials.”
Oral Presentations

Science and Health Care Track
1 p.m. - 4:30 p.m.
Wednesday, March 30
Hanley Classroom (Room 115)

Wednesday 3/30 at 1 p.m.

Anti-Allergic Effects by Arginase Inhibitors: Role of Histamine
Paul Jackson, Pharmacy major; Dr. Harm Maarsingsh, Associate Professor of Pharmaceutical Sciences, Lloyd L. Gregory School of Pharmacy

An allergic asthmatic attack causes bronchoconstriction and airway inflammation. Activated mast cells release various bronchoconstrictive mediators, such as histamine, and are responsible for the initial obstruction. Using lung slices from allergen-sensitized guinea pigs, we previously demonstrated that arginase inhibitors greatly prevented allergen-induced bronchoconstriction. In the current study, we further investigated the anti-allergic effect of arginase inhibition by studying its effect on mast cell activation by measuring histamine release from lung slices. Using ELISA to measure histamine levels, we first demonstrated that the allergen ovalbumin dose-dependently increased the release of histamine from the lung slices. Secondly, the effect of the inhibitors of arginase and/or the nitric oxide synthase on allergen-induced histamine release was measured. Via microscopy, allergen-induced bronchoconstriction was observed in selected slices from each animal to prove successful sensitization to the allergen. In conclusion, lung slices are a good model to study anti-allergic mechanisms of potential drugs.

Wednesday 3/30 at 1:30 p.m.

Apoptotic Effects of Quinones on Breast Cancer Cells
Paul Jackson, Pharmacy major; Dr. Adwoa Nornoo, Associate Professor of Pharmaceutical Sciences; Dr. Matthew DellaVecchia, Associate Professor of Pharmaceutical Sciences, Lloyd L. Gregory School of Pharmacy; Dr. Mireille Aleman, Associate Professor of Pharmaceutical Sciences, Lloyd L. Gregory School of Pharmacy; Dr. Vanessa Rowan, Assistant Professor of Biology, School of Arts and Sciences

Tetrahydroxyquinone and rhodizonic acid (dioxidyquinone), along with many other quinones, are capable of producing reactive oxygen species in the presence of a transition metal or ascorbate. Rhodizonic acid was previously examined to produce superoxide radicals with iron and copper, and 8-OHdG base adducts in the presence of copper or copper and ascorbate. Tetrahydroxyquinone was able to cause apoptosis in HL60 leukemia cells without affecting regular human blood leukocytes. MCF10a, a fibrocytic noncancerous epithelial cell line, and MCF7, an adenocarcinoma epithelial HER2 (+), ER/PR (+) cell line were chosen to examine the apoptotic effects of quinones on breast cancer. Forzamen, resazurin, and luminogenic assays were used to determine the best method of measuring cytotoxicity and cell proliferation. Tests examined tetrahydroxyquinone and rhodizonic acid, copper, iron, zinc, ascorbic acid, and their combinations. Tetrahydroxyquinone provided the best cytotoxic results with iron and ascorbic acid, and copper with or without ascorbic acid.

Wednesday 3/30 at 2 p.m.

Mechanisms Related to Exercise-Induced Reductions in Cancer-Related Fatigue - an 8 Week Exercise Program
Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance; Dr. Stephen Sylvester, Assistant Professor of Health and Human Performance; and Sara Orbe and Cody DeBoer, Health and Human Performance majors, School of Education and Behavioral Studies

Following a cancer diagnosis, exercise regimens have led to improvements in chronic fatigue, aerobic capacity and musculoskeletal strength. This investigation assessed changes in chronic fatigue, muscle strength and functional capacity in subjects experiencing cancer-related fatigue (CRF), following 8 weeks of exercise training. Eleven subjects were recruited for study participation. Using a Fatigue Symptom Inventory (FSI), fatigue was significantly decreased (PRE: 5.38, MID: 4.26, POST 3.70) following training. Reductions in fatigue were well correlated (r = 0.638) with decreases in resting blood lactate. Lower body strength (PRE: 71.67 lb, POST: 89.83 lb), right hip abduction (PRE: 29.62 N, POST: 56.88 N) and right bicep strength (PRE: 24.05 lb, POST: 33.75 lb) were significantly improved following training. No significant changes were found in resting or recovery heart rate and blood pressure during the program. Further reduced resting blood lactate levels may be responsible for reductions in perceived fatigue.

Wednesday 3/30 at 2:30 p.m.

Implementing and Assessing School-Wide Objective Structured Clinical Examinations: A Pilot Study
Nick Palm, Pharmacy major; Dr. Elias Chahine, Associate Professor of Pharmacy Practice; Dr. Anne Harring, Part-Time Assistant Professor of Pharmacy Practice, Lloyd L. Gregory School of Pharmacy

The school elected to implement objective structured clinical examinations (OSCEs) for pharmacy students to assess their knowledge, skills, and behaviors. The objectives of this study were to describe the implementation process and to assess pharmacy faculty perceptions regarding OSCEs. A workgroup comprised of pharmacy faculty members was tasked to work with a consultant, the assessment committee, and the curriculum committee to develop an OSCE program. An electronic survey was distributed to 20 faculty members involved in the program. After a series of lectures and workshops on best practices to implement OSCEs, a blueprint was created based on the school’s curriculum, five stations were developed by the OSCE workgroup, and two standard setting meetings were conducted to establish minimal
competing. Seventeen faculty members (85%) completed the Likert scale questionnaire. The majority of them viewed the new program favorably. The program was a valued addition to written examinations.

Wednesday 3/30 at 3 p.m.

Wealth and Riches

Allan Voiron, International Business major; and Ben Colabella, Accounting major, Rinker School of Business

Generation riches tend to be a lot easier than generating wealth, whether you are an entrepreneur or a CEO. This is because wealth is not only measured by income, but also by time. We often struggle in differentiating a wealthy person from a rich one, yet there is a fine line that separates a wealthy man from a rich one. Nonetheless, millennials rarely make the difference between the two. Thus, our research will focus on analyzing the personalities of men and women who are wealthy and of those that are rich, and draw conclusions on how one can create wealth rather than riches from a very rough age. Lastly, we will relate this research to the Bible by drawing parallels.

Wednesday 3/30 at 3:30 p.m.

Antimicrobial Effects of Essential Oils on Infectious Bacteria

Dr. Sanaz Dowell, Assistant Professor of Chemistry; Dr. Vanessa Rowan, Assistant Professor of Biology; Taylor Anderson, Medical and Biological Chemistry major; and Emily Ruple, Molecular Biology major, School of Arts and Sciences

The inhibitory effects of twelve essential oils were screened against three gram positive bacteria and three gram negative bacteria using the disk diffusion method. Of the twelve undiluted essential oils screened, five oils were selected for further testing using the broth microdilution method based on their ability to inhibit the bacterial growth for all six of the tested bacteria. Cinnamon oil showed the highest antimicrobial activity against all bacterial strains, with an average minimum inhibitory concentration (MIC) of 0.2% for P. aeruginosa and 0.05% to 0.1% for the other strains. Oregano and thyme oils showed an average MIC ranging from 0.05% to 0.1% for all bacteria except P. aeruginosa. Clove bud oil had an average MIC ranging from 0.2% to 0.4% for four of the tested strains. Tea tree oil had the lowest antimicrobial activity. These results show that essential oils are good candidates for fighting common infectious pathogens.

Wednesday 3/30 at 4 p.m.

Mobbing, Burnout and Religious Coping styles Among Protestant Clergy: A Structural Equation Model and its Implication for Counselors

Dr. Steven Vensel, Assistant Professor of Counseling, School of Education and Behavioral Studies

Clergy represent a specialized group of workers providing spiritual, personal, and social services. Clergy fulfill a unique and important role in the lives of many individuals and families and are often the first, and sometimes the only, helping relationship people turn to in times of trouble. The research reported in the presentation is the first investigation into abusive religious organizations linking mobbing and clergy. The study utilized structural equation modeling to establish that clergy do indeed experience mobbing in the workplace setting of the American church resulting in emotional exhaustion, depersonalization and diminished personal accomplishment, all factors of burnout which were mediated by religious coping styles. The presentation will report on the frequency and intensity of negative acts experienced by clergy and will report findings regarding clergy and mob characteristics, impact on clergy, how clergy cope, implications for all church members, and preventative strategies church members can utilize. The broad purpose of the presentation is to provide an educational experience in order to inform and deepen our understanding of the impact mobbing has on its victims in order to recognize and prevent this form of workplace abuse.

Liberal Arts And Social Science Track

1 p.m. - 4:30 p.m.
Wednesday, March 30
Warren Library (Room 208)

Wednesday 3/30 at 1 p.m.

Ethical Considerations Regarding Beginning of Life Issues

Dr. Paul Copan, Professor of Philosophy Ethics, The Pledger Chair, School of Ministry

Christians are duty-bound to honor human life—from its very beginning—as a gift and trust from God. As a “culture of death” continues to diminish human life, Christians can respond to such encroachments by drawing on the rich theological, philosophical, and moral resources of their faith. This paper will explore a range of them.

Wednesday 3/30 at 2 p.m.

Paul Behaving Badly: Reflections on How Society Views the Apostle Paul

Dr. Randy Richards, Dean and Professor of Biblical Studies, School of Ministry

Throughout Christian history, both inside and outside the Church, the Apostle Paul has often been heavily critiqued, accused of supporting slavery, hating women, and bashing gays. He’s been faulted as a jerk, a killjoy, and a racist. He’s alleged to twist Scripture. Moreover, his accusers are able to cite statements by Paul that seem to support the charges. Rather than address the accusations with a dismissive harrumph or pious assertions about biblical inspiration, the book Paul Behaving Badly seeks to take seriously the charges, look carefully at the Pauline texts and Paul’s cultural context, and then respond as to whether or not Paul was behaving badly.
The Location of Jesus’ Feeding of the Five Thousand: The Biblical Witness
Kevin Boyle, Biblical and Theological Studies Major, School of Ministry

This paper critically examines the accounts of Jesus’ feeding of the five thousand found in four canonical gospels with the goal of correctly identifying the most plausible authentic location for where the feeding miracle took place. The paper has two basic steps: first, it compiles the information provided in the four gospel accounts that is helpful toward identifying the place; second, on the basis of the useful information, it identifies the most plausible location on the coast of the Sea of Galilee. In this second section priority is given to Tabgha, the traditional location of the feeding of the five thousand. However, this study concludes that the most plausible authentic location for the feeding of the five thousand is not Tabgha, but rather a place near Bethsaida Julias.

Wednesday 3/30 at 3 p.m.

Reaching the Four Corners — Writing Center Space Across Campus
Rebecca Ethridge, English major, School of Arts and Sciences

This paper explores research concerning decentralizing the writing center space across campus. The writing center’s aim should be inclusivity and interaction among a diverse clientele, including students, faculty and staff. Expanding and decentralizing writing center services affords greater opportunity for inclusivity across campus. This paper will note the efforts of expansion of Palm Beach Atlantic University’s Center for Writing Excellence and will detail suggestions writing centers can use in order to expand the overall writing community.

Science And Health Care Track

1 p.m. - 4:30 p.m.
Thursday, March 31
Hanley Classroom (Room 115)

Wednesday 3/30 at 4 p.m.

Measure What You Value: A Review of Servant Leadership Research using the Organizational Leadership Assessment (OLA)
Dr. Jim Laub, Professor of Leadership Studies, MacArthur School of Leadership

The Organizational Leadership Assessment (OLA), developed in 1999, became the first assessment tool specifically designed to measure servant leadership characteristics in organizations. The OLA is built from the first research-based definition and conceptual model of servant leadership including six key servant leadership behaviors (Displays Authenticity, Values People, Develops People, Builds Community, Provides Leadership and Shares Leadership) along with three descriptors for each behavior. The OLA has been used in a variety of organizations; Education, Healthcare, Law Enforcement, Business, Nonprofits, Manufacturing and Faith-based organizations. This presentation will provide a basic introduction to the OLA/Servant Leadership model and the Six Health Levels of organizations. It will present the results of various studies conducted using the OLA to view the relationship of servant leadership in organizations to such topics as: Employee Job Satisfaction, Organization and Leader Trust, Team Effectiveness, Secondary School Student Achievement, Employee Attrition, Absenteeism, and Safety.

Wednesday 3/30 at 3:30 p.m.

The State of Religious Liberties in America
Cassie Stanton, Communication Major, School of Communication and Media

The research will focus on gaining a more full definition of religious liberties as the United States government now recognizes them. All research will be directed towards uncovering whether the current decisions made by the judicial branch of the United States pose a threat to the religious liberties the United States was built upon, as well as determining any hostility towards religious liberties. Research will begin by providing historical context for the political theory behind religious liberties and an outline of key events working to shift the definition of religious liberties. The research executed will draw upon a review of current Supreme Court cases, with a focus on the Obergefell v. Hodges case. The research will be conducted in hopes to seek to gain a fuller view of the trajectory of the United States in regards to the government’s view of the interpretation of religious freedoms.
Implications for Promoting Self-Caring Behaviors Within the Undergraduate Nursing Curriculum

Dr. Deborah Morgan, Associate Professor of Nursing, School of Nursing

Due to immense learning requirements, nursing students often report a higher level of stress than their educational counterparts. The increased stress levels have been attributed to multiple demands including accelerated clinical practice and course requirements, employment, and family obligations. A pre-test posttest, single group design was used to assess student's self-care caring behaviors. Self-care practices were measured using Nola Pender's Health Promoting Lifestyle Profile II (HPLP II). For all scales, the increase from pretest to posttest was statistically significant. Promoting self-care may enhance students' to engage in a healthier lifestyle prior to entry into practice. Taking care of one's self by living and modeling healthy behaviors may enhance the nurses' ability to educate and encourage patients to engage in healthier behaviors improving their overall health outcomes.

Study of Mean Reaction Time of Bimolecular Reactions in Two Dimensional RDME Systems

Erin Tierney, Mathematics major, School of Arts and Sciences

Biochemical species that diffuse in cells and react together are known as reaction-diffusion systems. As seen in Alan Turing's original work, certain biological systems remain in a state of equilibrium; however, these may become unstable in the presence of diffusion. Stochastic modeling of reaction-diffusion kinetics has produced various models, including the reaction-diffusion master equation (RDME). Recent developments related to the RDME have shown that when voxel size decreases infinitely in two dimensional domains, some bimolecular reactions are lost. Results from a study conducted by Stefan Hellander suggest a new formula to determine the mean time of a bimolecular reaction between particles when firing for the first time. The purpose of this research is to test Hellander's formula for accuracy. We found that Hellander's formula does not match the numerical experiment and then proposed an alternative formula to match the mean of the biomolecular reaction's firing time in the RDME System.

Purification of a Protein Segment Involved in Many Types of Leukemia

Dr. Sandra Szegedi, Associate Professor of Chemistry, School of Arts and Sciences

MLL (Myeloid-Lymphoid Leukemia) gene translocations and subsequent in-frame fusion to ~70 partner genes are involved in many leukemias. These in-frame fusions generate chimeric proteins comprised of the N-terminus of MLL fused to the C-terminus of the translocation partner. The N-terminus of MLL contains the DNA binding AT-Hooks and CXXC domains. The AT-Hooks region is not characterized biochemically as to its structure and DNA binding properties. The research performed is a biochemical characterization of the structure and function of the AT Hooks domain. I purified the 31.2 kDa MLL AT Hooks domain segment from an E.coli host containing an overexpression plasmid. The plasmid encodes for the AT Hooks segment containing a 6X-His Tag. A His Tag affinity column was used to purify the protein to ~90% homogeneity. DNA binding and co-crystallization studies at Scripps Florida will be done to determine its structure and DNA-binding abilities.
Thursday 3/31 at 1 p.m.

University of Roehampton Dance: A Summary of Findings

Dr. Kathleen Klein, Professor of Dance, School of Music and Fine Arts

With today’s ever-evolving technology and an ever-expanding accessibility to multiple mediums of art and entertainment, dance continues to sustain itself as a valid field of study in higher education. The purpose of this research study is to observe the Dance Program at the University of Roehampton in London, England and to study its mission statement, dance curriculum, faculty, resources, facilities and equipment. Roehampton Dance provides an excellent opportunity for this researcher to interview colleagues, track student progress and record the pedagogical methodologies of its Dance Educators that are known to “blend choreography with world-leading thinking.” This study focuses on how Roehampton’s model of teaching compares with Palm Beach Atlantic University’s integration of faith and learning in the form of an electronic notebook for the PBA community.

Thursday 3/31 at 1:30 p.m.

Unmanned Drones in U.S. Antiterrorism Policy Since 9/11

Jeremiah Clarke, Pre-Law major; Dr. James Todd, Assistant Professor of Politics, School of Arts and Sciences

This research project conducts a multi-perspective analysis of the use of unmanned drones in the war on terror and examines the constitutional, moral, and practical dimensions of U.S. counterterrorism policy since the attacks of September 11, 2001. A specific focus is placed on the controversial increase in governmental and primary executive power including the President’s ability to deploy drones for targeted assassinations.

Thursday 3/31 at 2 p.m.

What if Atticus Finch is Wrong? Palliative Memory and Racial Discourse

Lisa Marzane, Assistant Professor of English and Director of Writing Programs, School of Arts and Sciences

Though overwhelmingly popular with mainstream readers for over fifty years, To Kill a Mockingbird has been mostly ignored by literary scholars. In fact, law professors and legal scholars have produced the vast majority of scholarship on the text. This study begins with a question regarding the incongruence between popularity with middlebrow readers and a lack of interest or even disdain from academia, often because Mockingbird is considered a children’s text. My study travels through concepts such as reflective and restorative nostalgia, discourse ethics, symmetrical reciprocity, and collective memory of race as I demonstrate that the text is more complex than credited. I introduce a new term, palliative memory, and discuss how Atticus Finch’s philosophy of climbing into the “skin” of another is not only impossible, but it is also detrimental to any discourse regarding race in America.

Thursday 3/31 at 2:30 p.m. – Group Presentation

Through the Eyes of an Outsider: Leopold Bloom as a Protagonist and Guide in Ulysses

Brooks Daigle, English major, School of Arts and Sciences

The protagonist of James Joyce’s Ulysses, Leopold Bloom, is a character that simultaneously entices readers and repels fellow characters. The unexpected methods by which Joyce creates Bloom are fascinating — although even the most conscientious reader may struggle to identify exactly what sets Bloom apart from his peers. Bloom is characterized not only by the hyper-consciousness through which we read the story, but also his Jewish heritage and his tendency to be perceived as feminine. Joyce uses the unique character of Leopold Bloom to give his readers an outsider’s perspective on Dublin, personal and professional male relationships, and even a dysfunctional marriage. Through the inclusion and exclusion of particular details and information, Joyce’s Bloom is the odd looking glass through which one reads the story of Ulysses.

Dadaism and Christianity

Kurt Burghardt, English major, School of Arts and Sciences

Dadaism was a revolution in art where artists challenged the preconceived ideas of art. It has been argued that one of the precepts Dadaism tried to escape from was religion, relying instead on the beliefs of humanism and secular transcendence. Because of this, Dadaistic art and literature appeared...
incomprehensible and incorrigible from a Christian perspective. This presentation will make the argument that Dadaism was simply a release of a collective unconscious frustration with man’s futile attempts at secular preeminence. I will be using the writings of Carl Jung, Francis Schaeffer, the apostle Paul, Jean Arp, Tristan Tzara, and Rodney Reeves to thoroughly demonstrate the hidden meaning behind Dadaism from a Christian perspective. The doctrines of Christianity dictate that the true path to transcendence is found in obedience to God. Dadaism reveals the absurdity of resisting God’s love and divine omnipotence.

**Where Infinity Stops**

Thomas Lubben, English major, School of Arts and Sciences

In this essay, I will explore the correlation of global technological advancement to poetry. Using examples from John Magee and Howard Nemerov, I will describe the wonder and sense of discovery progress has fed. I will also contrast this with the imaginative quality of poems of the past and consider the differences in the world such a shift in expectancy entails. Citing Bertold Brecht’s “Radio Poem,” I will discuss the fearful, weakening world available through non-stop, ever-present technology and how this stunts creative and courageous growth. This point with mesh with my examination of the automobile in Marinetti’s “The Foundation and Manifesto of Futurism.” Ultimately, I purpose to describe how an expansion of our accessible horizon through technology, though fostering a sense of universal connection, can in fact limit and distract our experience of the world.

**Thursday 3/31 at 3:30 p.m.**

**It’s a Zoo Out There: Findings About Learning Outside of the Classroom**

Dr. David Horkott, Associate Professor of Philosophy, School of Arts and Sciences

For two consecutive years, students enrolled in Creative Thinking and Effective Reasoning have been given real-world problems to solve. The problems are identified and communicated by the staff at the Palm Beach Zoo and Conservation Society. Working in groups, university students present their creative solutions to a panel of zoo officials led by Janet Steele, the director of Wildlife Care and Conservation. One of the aims of this research presentation will be to answer the following question: “How is service learning different from volunteer work?” This presentation will answer that question in light of the reciprocal relationship between philosophy students and the human (and non-human) animals at the Palm Beach Zoo.

**Thursday 3/31 at 4 p.m.**

**The Condemned Dead: A Look at the Tradition of Irish Cillín Burials**

Jordyn Marlin, History major, School of Arts and Sciences

The death of a child is always a tragedy, but what happens to that child’s soul in the afterlife? According to the medieval church teachings, any unbaptized soul was unfit for heaven and thus was condemned to hell. The separate burial practices for unbaptized children is a fascinating practice that was upheld in Ireland until the 1970s. With this practice now abolished, archaeologists are able to excavate these children’s burial grounds, also known as cillini, to better understand the burial population of Ireland. I have had the opportunity to participate in such excavations. As these children were forbidden from an ecclesiastical burial, often times they were placed in old monuments, abandoned ecclesiastical sites, or other various sacred locations. These burials are often a forgotten aspect of the Irish landscape. The paper is an analysis of the written history of this burial tradition along with archaeological interpretation of its practical application.
Identification of Bioactive Fraction CGMA03 from Seeds of Annonaceae

Erika Barajas, Marine Biology major; and Dr. Cidya Grant, Assistant Professor of Chemistry, School of Arts and Sciences

Cellular components of organisms contain a variety of naturally-occurring organic compounds which have potential use as scaffolds in drug development. Breast cancer is one of the leading causes of death in women. While conventional chemotherapies in the treatment of malignancies are still somewhat efficient, the search for innovative approaches that have less toxic effects and greater efficacy in the treatment of resistant tumors has paved the way for the study of natural compounds and their benefits in the treatment of many cancers. In this study a new extraction method was developed for isolating the components from seeds of a local plant belonging to family Annonaceae. Crude and purified fractions of these extracts were used in cytotoxicity studies on human breast cancer cell lines. The isolated fraction giving similar bioactivity as the crude extract has been identified, and is now being called CGMA03. Further work is currently being done with CGMA03, for assessment of chemical functionality and structural determination.

Carbohydrate Ingestion on Hydration Status and VO2 Kinetics During Maximal Exercise Testing

Alejandro Castenada, Exercise Science major, School of Education and Behavioral Studies

Hydration can be achieved in several ways, among them water, isotonic solution, pasteurized milk, infusion of pure glucose and solution of pure sodium chloride. Six subjects underwent 48h of 1) exclusive water intake and 2) exclusive carbohydrate drink intake prior to VO2max testing. During the VO2max test performance time, minute ventilation (VE), respiratory exchange ratio (RER), aerobic threshold (AT) and volumes of carbon dioxide (VCO2) and oxygen (VO2) were measured. In this study nine different t-tests were performed, analyzing time, volume of oxygen, volume of carbon dioxide, and others. Results will be discussed.

Implementing and Assessing School-Wide Objective Structured Clinical Examinations: A Pilot Study

Dr. Elias Chahine, Associate Professor of Pharmacy Practice; Dr. Anne Harring, part-time Assistant Professor of Pharmacy Practice; and Nick Palm, Pharmacy major, Lloyd L. Gregory School of Pharmacy

The school elected to implement objective structured clinical examinations (OSCEs) for pharmacy students to assess their knowledge, skills and behaviors. The objectives of this study were to describe the implementation process and to assess pharmacy faculty perceptions regarding OSCEs. A workgroup comprised of pharmacy faculty members was tasked to work with a consultant, the assessment committee, and the curriculum committee to develop an OSCE program. An electronic survey was distributed to 20 faculty members involved in the program. After a series of lectures and workshops on best practices to implement OSCEs, a blueprint was created based on the school's curriculum, five stations were developed by the OSCE workgroup, and two standard setting meetings were conducted to establish minimal competency. Seventeen faculty members (85%) completed the Likert scale questionnaire. The majority of them viewed the new program favorably. The program was a valued addition to written examinations.

Herpetofaunal Survey of an Appalachian Cavern System

Dr. Thomas C. Chesnes, Associate Professor of Biology; Joshua Holbrook, Biology major ’09, School of Arts and Sciences

Cavern systems provide relatively isolated niches within temperate terrestrial Appalachian ecosystems. These ecosystems are light limited, often damp, and temperature moderated, thus providing habitat and available niches to lifeforms adapted to these specialized conditions. An ecological survey was conducted in a series of cave systems in western North Carolina. The focus of the study was on specialized forms of herpetofauna, especially salamanders. Preliminary results will be discussed.

Public Perception of the Ecological Value of Coastal Organisms in Palm Beach County, Florida

Dr. Thomas C. Chesnes, Associate Professor of Biology; Morgan Belle, Reana De Pass, and Trinity Livingston, Biology majors, School of Arts and Sciences; and Shawn McCall, Gale Academy of Environmental Science, Forest Hill High School

Coastal resources provide approximately $1.7 billion to Palm Beach County’s GDP and 776 million in wages to the county’s workforce in 2010. Through harvesting natural resources, maritime industries, and tourism, a healthy coastal environment is imperative to a vibrant Palm Beach County economy. In particular, Palm Beach County’s urban estuary, Lake Worth Lagoon, plays an important role in maintaining the county’s coastal biodiversity and economic vitality. Despite the significant contribution to the region’s economic base, coastal ecosystem services often go underappreciated. Small or non-charismatic species such as plankton, polychaete worms, or seagrasses go unnoticed or seen as unimportant. These foundational species are important for the survival of larger, more noticeable species such as wading birds, fish, or manatees. Without the species at the base of food chain, species at the higher trophic levels (and usually with a more direct economic impact) will not be sustained. This project serves to promote awareness among the region’s stakeholders of underappreciated coastal species, estimate their contribution to the coastal economy, and produce media and publications. It is a product of collaborations between students of Palm Beach Atlantic University and Forest Hill High School. The products will contribute to the knowledge base of these species in the county’s coastal environments and raise public awareness of the organisms and promote their conservation.
Correlation of Overall Fitness and Indicators of Depression in College Freshman

Juleah Cintron, Human Performance and Sport major, School of Education and Behavioral Studies

Exercise can reduce negative physiological and psychological symptoms of depressed populations. This study examined correlations between indicators of overall health and fitness and indicators of depression in cohort of female college freshman. Fourteen Female college freshman students (18.9yr, +1.14) were selected. Indicators of health and fitness were assessed using a Polar TriFit system. Subjects also completed a Beck Depression Inventory (BDI). No significant correlation (r = 0.364) was found between overall fitness scores and indicator of depression. A significant correlation was found between bicep strength and BDI (r = 0.828). No direct link to a higher fitness level, and indicators of depression in college freshman was found. There may have been outside variable that affected the data, such as obsessive exercising as a result of a mood or mental disturbance. More research must be done, with a bigger cohort, to determine if such relationship exists.

Antimicrobial Effects of Essential Oils on Infectious Bacteria

Dr. Sanaz Dovell, Assistant Professor of Chemistry; Dr. Vanessa Rowan, Assistant Professor of Biology; Taylor Anderson, Medicinal and Biological Chemistry major; and Emily Ruple, Molecular Biology major, School of Arts and Sciences

The inhibitory effects of twelve essential oils were screened against three gram positive bacteria and three gram negative bacteria using the disk diffusion method. Of the twelve undiluted essential oils screened, five oils were selected for further testing using the broth microdilution method based on their ability to inhibit the bacterial growth for all six of the tested bacteria. Cinnamon oil showed the highest antimicrobial activity against all bacterial strains, with an average minimum inhibitory concentrations (MIC) of 0.2% for P. aeruginosa and 0.05% to 0.1% for the other strains. Oregano and Thyme oils showed an average MIC ranging from 0.05% to 0.1% for all bacteria except P. aeruginosa. Clove bud oil had an average MIC ranging from 0.2% to 0.4% for four of the tested strains. Tea tree oil had the lowest antimicrobial activity. These results show that essential oils are good candidates for fighting common infectious pathogens.

Hemoglobin Mass and Maximal Aerobic Capacity in College Freshman During the Competitive Women's Soccer Season

Lesslee Hernandez and Grace Patterson, Exercise Science majors; and Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance, School of Education and Behavioral Studies

VO2 (ml·kg·min⁻¹) is elevated after training and in most athletes undergoing extensive aerobic training. Furthermore, anemia is more common in female athletes. To examine VO2 max capacity and hemoglobin levels during pre-season and post season of a collegiate soccer season, eleven PBA women soccer players tested both pre and post season. A maximal graded exercise test was used to assess VO2 and other physiological variables. Hemoglobin levels were drawn using a hand prick, measured using a hemoglobin meter. Repeated measures ANOVA was used to compare data. Results will be discussed.

Palmar Cooling and Perceived Soreness in Varied Athlete Groups

Samantha Gray and Alejandro Castaneda, Exercise Science majors; and Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance, School of Education and Behavioral Studies

Palmar cooling removes heat from the circulating blood in the glabrous skin of the palm, ultimately altering the muscle temperature. Ten subjects were placed into either cooled (C) or non-cooled (NC) groups, paired for age and activity level. All subjects performed a specific resistance training, with resistance modified for inexperience and activity level. For each exercise, four sets of twelve reps were performed, with 1-2 minutes rest between sets. After each lifting session, members of the C group would rest for five minutes then use the hand-cooling glove for ten minutes (the NC group would rest for fifteen minutes). Each group performed five different workouts throughout a three-week span, resulting in five different hand-cooling sessions for the test group. To test the subjects’ muscle soreness, a Wong-Baker Faces scale was used, 1-10 pain scale. Soreness was assessed 24 hours post exercise and 48 hours post exercise.

Tripping the Light Fantastic: Modelling the Consequences of Recreational Use of MDMA or 5-MeO-DIPT in Humans Using Weekend 'Rave' Exposures

Friederike S. Luetzenberg and Esther Rodriguez, Counseling majors; David M. Compton, Professor of Psychology, School of Education and Behavioral Studies

Previous research has supported the position that the hallucinogenic “club drugs” 3, 4-methylenedioxyamphetamine (MDMA) and 5-methoxy-N, N-diisopropyltryptamine hydrochloride (Foxy),...
albeit to different degrees, remain popular as recreational drugs. Much is known about MDMA including observations that in comparison to female rodents, males appear to be more sensitive to the toxic effects associated with abuse. Conversely, less is known about the possible sex differences associated with the abuse of Foxy, especially when the consequences of its use are examined during the neuropsychological development period of adolescence. In the present study, beginning at 35 days of age male and female rats were given multiple doses of MDMA, Foxy (5 mg/kg), or saline across a 48 hour “weekend” under conditions approximating that of a rave. The results will be discussed in the context of putative sex-mediated differences in sensitivity to MDMA or Foxy. In addition, the disruptive effects of these drugs to central serotonergic systems during adolescence that may contribute to cognitive deficits and maladaptive behavior will be explored.

**Bile Acid Biosynthesis of Intestinal Dendritic Cells**

Kayla Mendez, Medicinal and Biological Chemistry major; Kiyoshi Takeda, Hisako Kayama, Mark Sundrud

The mammalian intestine is a complex tissue, where circulating immune cells are exposed to host digestive and bacterial metabolites not seen elsewhere in the body. Work from our lab has found that immune cells, such as CD4⁺ T cells, “adapt” to enforce local immune homeostasis in the presence of the unique intestinal microenvironment. Genetic ablation of these intestinal adaptations drives local T cell dysfunction and results in chronic intestinal inflammation mimicking inflammatory bowel disease (IBD). Currently, I am exploring the mechanisms underlying T cell adaptation, focusing on how intestinal dendritic cells (DCs) induce expression of one such adaptation, a multidrug/xenobiotic transporter, MDRI. Leveraging a series of genetically modified mouse models, my goal is to gain new insights into the mechanisms through which intestinal DCs instruct local T cell adaptation in the gut. Ultimately, these studies will piece together the series of events that enforce intestinal immune homeostasis and prevent IBD.

**A Descriptive Analysis of Health and Wellness in HHP 1061 Lifetime Fitness Students**

Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance; Denise Breitkreuz, Assistant Professor of Health and Human Performance; Grace Patterson and Juleah Cintron, Exercise Science majors; Sara Orbe and Cody DeBoer, Human Performance and Sport majors, School of Education and Behavioral Studies

198 students enrolled in HHP 1061 Lifetime Fitness courses at Palm Beach Atlantic University took part in the study. Health and Fitness indicators were measured including heart rate, blood pressure, body mass index, body composition, aerobic capacity, flexibility and muscle strength. Using Polar TriFit testing population standards, man overall Fitness Score the 63.68 percentile (p<0.05) and aerobic capacity was the 51.98 percentile. 21.21% of subjects had BMI > 25.0, 22% exhibited pre-hypertensive blood pressure and 6.63% exhibited body fat content; all associated with increased risk of heart disease. Students completed a survey assessing health and wellness behaviors before and after the course was completed. Survey data presented evidence that more students reported a better understanding as to whether or not they believe regular exercise is very important to maintaining overall health.

**Electrocardiographic Changes Found During Graded Exercise Testing in Cancer Patients**

Dr. Matthew J. Mitchell, Associate Professor of Health and Human Performance; Dr. Stephen Sylvester, Assistant Professor of Health and Human Performance; and Sara Orbe and Cody DeBoer, Health and Human Performance majors, School of Education and Behavioral Studies

Seventeen (17) female and four male subjects (60.0 yr ±9.4) underwent submaximal, graded exercise testing prior to admittance into the Cancer Related Fatigue program at Palm Beach Atlantic University. ACSM and AHA standards were followed for electrocardiographic interpretation and classification of cardiovascular heart disease (CHD) risk factors. Though the cardiovascular needs of cancer survivors have not been described, nearly 50% of subjects exhibited one or more values related to significantly reduced cardiovascular capacity and potential disease.

**Assessing Facultative Herbivory in a Marine Omnivore with Compound-Specific Stable Isotope Analysis**

William F. Patterson III, David Hollander, Greg Ellis, Ethan Goddard, Stephanie Mambelli, Biology majors, School of Arts and Sciences

Herbivory (both obligate and facultative) is a widespread specialized feeding ecology thought to be evolutionarily advanced. Most herbivorous fishes are obligate herbivores, but facultative herbivory has also been reported in a range of species. It is unclear, however, to what degree these facultative herbivores derive nutrition directly from plants or algae. The objective of this study was to examine whether pinfish (Lagodon rhomboides), a model estuarine-dependent omnivore, assimilates carbon directly or indirectly from sea grass or macroalgae. To accomplish this, we analyzed bulk and amino acid-specific C and N stable isotopes of pinfish muscle and primary producers from two northern Gulf of Mexico estuaries to estimate trophic position and sources of primary production. Our data suggest that epiphytic algae support the invertebrates targeted by larger pinfish, but pinfish from neither study site appeared to be assimilating epiphytic algal N and C or sea grass C directly.

**On Building an Extremely-Large Number Calculator**

Dr. Ken Pembamoto, Associate Professor of Computer Science; Caleb Panza and Matt Rothenberger, Computer Science majors; School of Arts and Sciences.

In this presentation, a methodology for building a computational facility based on current computer technology is presented. It enhances the computational capabilities of a calculator by using two complementary strategies: One: It reduces the mathematical complexity of the associated algorithms by applying
transformational processes that pertains to that problem’s class. These processes must be developed for each class of problems under study. One such problem that is under consideration in this study is the computation of $2^n$ for an arbitrary number $N$, where $N$ is a large number. Second: It increases the computational power in a seamless reconfiguration of the networked system environment. The number of computers in the network can be changed without affecting the ongoing active calculations. The resulting calculator system is then capable of tolerating computer system failure and shutdowns as computations may require long period of time to complete.

Investigation of the Effects of GCMA Extracts and GCMA03 Fraction on Various Triple Negative Breast Cancer Cell Lines

Andrea Romanowski, Molecular Biology major; Megan Bruinius, Biology Pre-Health Professional major; and Dr. Mireille J. Aleman, Associate Professor of Chemistry, School of Arts and Sciences

Breast cancer is one of the leading causes of death in women. Current treatments are largely dependent upon the status of the estrogen receptor (ER) in the affected cells. While conventional chemotherapies in the treatment of malignancies are still somewhat efficient, the search for innovative approaches that have less toxic effects and greater efficacy in the treatment of resistant tumors has paved the way for the study of natural compounds and their benefits in the treatment of many cancers. Our laboratory has shown that crude extracts from the seed of a local fruit have a differential effect on various breast cancer and normal breast tissue. Our data suggests that the efficacy of extracts in some breast cancer cells but not others may be correlated to the absence of the estrogen pathway in the responsive cell system.

Investigation of the Molecular Pathways Involved in the Induction of Apoptosis in GCMA03 Treated Breast Cancer Cells

Andrea Romanowski, Molecular Biology major; Megan Bruinius, Biology Pre-Health Professional major; and Dr. Mireille J. Aleman, Associate Professor of Chemistry, School of Arts and Sciences

Breast cancer is one of the leading causes of death in women. Current treatments are largely dependent upon the status of the estrogen receptor (ER) in the affected cells. Our laboratory has shown that crude extracts from the seed of a local fruit have a differential effect on various breast cancer and normal breast tissue. Hence, we are interested in evaluating the molecular pathways associated with the differential induction of apoptosis in ER negative cells.

Nutrients in Leaves of Pond Apple Trees (Annona Glabra) and Surrounding Soil and Water in Cypress-Pond Apple Swamps in the Northern Everglades

Peggy VanArman, Professor of Biology; Keegan Baldock, Medicinal and Biological Chemistry major; Isabelle George, Katherine Harvey, Kyle Holly, Samantha Loutzenhiser, and Luke Young, Biology majors, School of Arts and Sciences

Pond apples (Annona glabra) are important trees that are used to form an extensive swamp between Lake Okeechobee and the Everglades but currently occur as remnants of cypress swamps and tree islands in the Northern Everglades. Values include: medicinal resources, wildlife habitat and food, soil anchoring, soil, and nutrient uptake such as nitrogen (N) and phosphorus (P). In excess, N and P may cause nutrient enrichment. Two QI studies (TI-2012 and ARM LNWR-2013) were conducted to determine carbon (C), nitrogen (N), and phosphorus (P) values in green and senescent leaves, and in surrounding soil and water, focusing on P. Concentrations of nutrients in green leaves varied seasonally and between sites within each study area, but had similar concentrations of P at both locations. Future studies should include effects of nutrients on growth rate of pond apples, and biomass per acre of pond apples in enriched vs unenriched conditions.
Notes