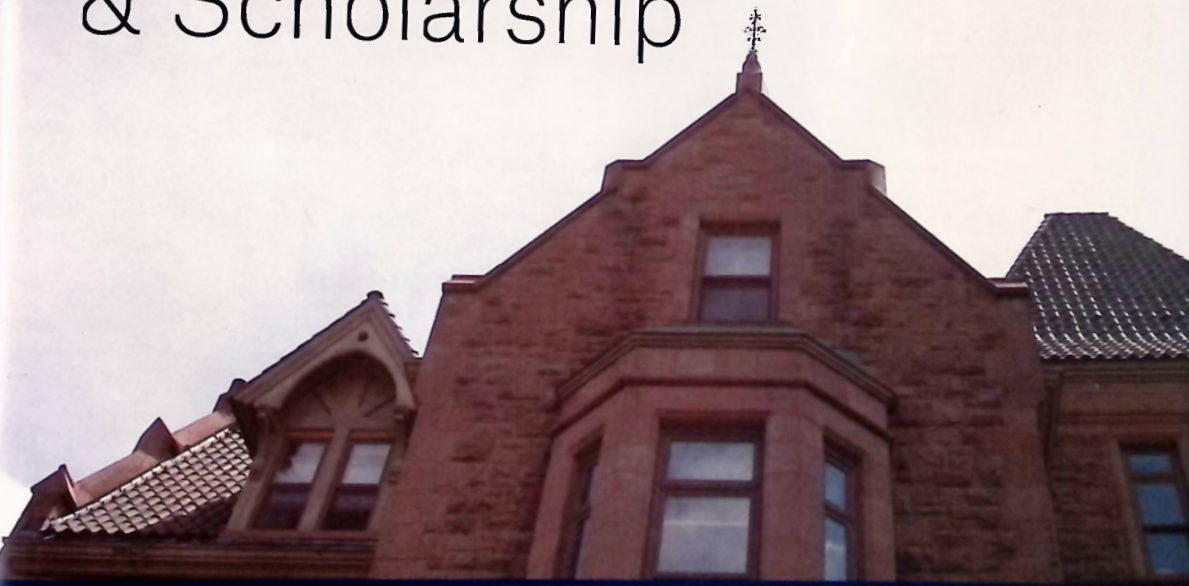
WILKES UNIVERSITY

Scholarship Symposium

Celebrating Faculty Research & Scholarship



4 to 7 p.m., Tuesday through Thursday,
March 28-30, 2017

WILKES UNIVERSITY

Scholarship Symposium

March 28–30, 2017

The Wilkes University Scholarship Symposium celebrates the outstanding faculty research and scholarship taking place throughout this institution's spectrum of disciplines. Because scholarship is one of Wilkes' core values, President Patrick F. Leahy committed $1 million to create the Research and Scholarship Fund in 2016. The fund provides financial support to faculty for their work as scholars and creative practitioners. Faculty, students and Research and Scholarship Grant recipients share their work at this annual symposium.

Tuesday, March 28 — Presentations

4-4:30 p.m.

Breiseth Hall, Room 106

Welcome

President Patrick F. Leahy

Opening Presentation

"Research and Scholarship at Wilkes: Then, Now and Tomorrow"

Michael Steele, Ph.D.
Professor and Chair of Biology

In this brief overview, I will discuss the value of research and scholarship activities, including those that involve undergraduates, for a small university such as Wilkes. I will emphasize the value of such hands-on activities for (1) enhancing the student experience and maximizing post-graduate opportunities, (2) providing opportunity for faculty to remain active in their field and thereby optimize their performance and relevance in the classroom, and (3) for both faculty and students to advance the national reputation of the university while also contributing to their own success and distinction. I will also attempt to characterize the state of research and scholarship activities in the past and today at Wilkes, and discuss how these activities now help to define Wilke's profile and mission and distinguish it among approximately 20% of universities nationwide. Finally, I will propose several directions Wilkes might consider that will strengthen our programs in research and scholarship in the future and eventually help Wilkes move towards achieving national recognition in the area of research and scholarship.

Michael A. Steele is professor and chair of biology and the H. Fenner Chair of Research Biology at Wilkes University. Dr. Steele is one of the leading authorities on the process of rodent-mediated seed dispersal, especially in oaks. His broader research interests include evolutionary ecology; behavioral, population and community ecology of vertebrates; plant-herbivore interactions, seed predation and seed dispersal.

In 2016, the National Science Foundation awarded Dr. Steele an OPUS Award to complete a book synthesizing his research on oak seed dispersal. Instituted in 2013, these grants have been awarded almost exclusively to researchers at larger, research-focused institutions.

Also in 2016, Dr. Steele received the first Wilkes University President's Award for Excellence in Scholarship. He is also the recipient of a Bullard Fellowship at Harvard University in 2012-13, and a Fulbright Fellowship to Mexico in 1997-98. Dr. Steele has published over 100 peer-reviewed publications and secured over $5 million in research and educational grants.

Over his career he has mentored more than 200 undergraduate students in research, with the majority of these students pursuing medical school, other health-related careers or graduate programs. Many have pursued doctoral degrees, and three have been awarded NSF pre-doctoral graduate research fellowships.

Dr. Steele joined the Wilkes faculty in 1989, becoming a full professor in 2003 and serving as department chair since 2001. He is also an adjunct associate research professor in the Department of Forestry and Natural Resources at Purdue University. He conducted postdoctoral research at N. C. State University, and earned his doctorate in biology from Wake Forest University and his bachelor's in biology at Millersville University of Pennsylvania.

SESSION I

Z.J. Witczak, *Presider*
Cohen Science Center, Room 102

4:30-5 p.m.

1. Using synthetic biology to engineer cyanobacteria that remediate atrazine. **T. Wasiluk**, G.P. Queen, W. Terzaghi, D. Lucent.

5:05-5:35 p.m.

2. Next-generation lesson planning: Translating preservice secondary science teachers' research into lesson plans. **D. French**.

5:40-6:10 p.m.

3. Two novel non-coding RNA molecules that have unexpected roles in controlling plant development. **W. Terzaghi,** B. Morocho, M. Yuhas.

6:15-6:45 p.m.

4. The relationship of local leaders and business institutions with entrepreneurs in NEPA. **B. Heim,** M. Clevenger.

6:50-7:20 p.m.

5. Psychological safety as a critical component of higher education student success. **A. Burns,** B. Mackesy.

SESSION II

B. Culver, *Presider*
Cohen Science Center, Room 103

4:30-5 p.m.

6. Obstacles and successes in implementing kangaroo care for neonates in rural Africa. **L. Winkler,** S. Noon.

5:05-5:35 p.m.

7. Assessing the fluoro-stabilization effect using *in vivo* unnatural amino acid incorporation. **C. Henkels.**

5:40-6:10 p.m.

8. Creative non-fiction. **B. Culver.**

6:15-6:45 p.m.

9. Cell signaling, gene regulation, and development: Using *Drosophila* to study epidermal growth factor receptor signaling target genes. **L. Kadlec.**

6:50-7:20 p.m.

10. Entrepreneurial communities: Highlights from NEPA. **M. Clevenger,** E. Newell, M.W. Fortunato.

SESSION III

A. Shimizu, *Presider*
Dorothy Dickson Darte Center, Gies Hall

4:30-5 p.m.

11. Green Hill: euphonium solo. **E. Fowler,** P. Simon.

5:05-5:35 p.m.

12. Working life with language: Four voices. **M. Anthony,** L. Kuhar, M. Cordisco, C. Santo.

5:40-6:10 p.m.

13. Real-time monitoring and stimulation of the brain. **A. Sabouni.**

6:15-6:45 p.m.

14. Spirits in the modern world: Malaysian women's ways of knowing. **G. Morrison.**

6:50-7:20 p.m.

15. Detection of cervical spondylotic myelopathy using a noninvasive microwave imaging technique. **S. Al Muqatash,** A. Sabouni.

Tuesday March 28 — Posters

Location: Cohen Lobby
5-7 p.m.

16. Analysis of vegetation communities within natural gas pipeline corridors of northeastern Pennsylvania. **A. Campisi, C. Gregory, C. Heid.** K. Klemow, **J. Youkoski.**

17. Characterization of novel epidermal growth factor receptor target genes implicated in *Drosophila* development. **A. Morgan,** L. Kadlec, **N. Seabridge, Z. Walter.**

18. Determining sex-based differences in resveratrol and piceid production by Japanese knotweed. **A. Ford,** K. Klemow, **J. Luchetta,** D. Mencer, **A. Mikolon, D. Pupaza,** W. Terzaghi, **M. Yatison.**

19. Synthesis and characterization of a copper-based macrocyclic chelate for quantitation and sequestration of oxalate, the major component of kidney stones. **J. Hensley,** K. Hiryak, **D. Hontz,** D. Lucent, W. Terzaghi, **M. Torsiello,** A. VanWert, M. Venditto.

20. Food web ecology in northeast Pennsylvania grasslands: Insights from stable isotopes. N. Fetcher, T. Holleran, E. Rider, A. Schall, C. Shonk, **J. Stratford,** M. Suchocki.

21. Women in entrepreneurship: A literature review. A. Batory, M. Clevenger, M. Lehman, **E. Meinhart,** S. Reinhardt.

22. Entrepreneurial communities: How education matters. M. Clevenger, **D. Graff.**

23. Biogeographic variation in insect-acorn interactions: Tolerance vs. resistance in an animal-dispersed plant. **K. Schafer,** M. Steele, J. Stratford.

24. I've got this: Perceived control mediates the relationship between stress and entrepreneurial success. **D. Jolley,** E. Newell, M. Clevenger.

25. Evaluating the use of standardized patients in an advanced physical assessment distance education course during a nurse practitioner residency. **M. Miskovsky, P. Sweeney.**

Wednesday, March 29 — Presentations

SESSION IV

P. Sweeney, *Presider*
Cohen Science Center, Room 102

4-4:30 p.m.

26. Pennsylvania public school-based mental health rights of adult students. **S.R. Phillips,** B. Mackesy.

4:35-5:05 p.m.

27. Virtues for affective engines. **C. Zarpentine.**

5:10-5:40 p.m.

28. Topological analysis of protein dynamics using persistent homology. **S. Chepushtanova,** D. Lucent, M. Notaro.

5:45-6:15 p.m.

29. Teacher education for social and emotional learning environments. **J. J. Mao,** D. Polacheck, E. Schicatano, E. Maculloch, M. Callagy.

6:20-6:50 p.m.

30. A structured education program for community dwelling older adults. **L. Pajalich.**

SESSION V

B. Schneider, *Presider*
Cohen Science Center, Room 103

4-4:30 p.m.

31. Design and validation of a low-cost portable device to quantify postural stability. **Y. Zhu.**

4:35-5:05 p.m.

32. Impact of a discipline model on teacher efficacy and burnout: Perspectives for elementary teachers in Michigan. **L. Cooper.**

5:10-5:40 p.m.

33. A transfiguration of longing. **H. Sincavage.**

5:45-6:15 p.m.

34. Toward entrepreneurial community development: Leaping cultural and leadership boundaries. **M. Clevenger,** M.W.P. Fortunato.

6:20-6:50 p.m.

35. Family business trends and issues in the 21st century: Research in NEPA. **M. Clevenger,** L. Jordan, J. Alves, E. Newell.

SESSION VI

A. Shimizu, *Presider*
Dorothy Dickson Darte Center, Room 202

4-4:30 p.m.

36. Is feminism a solution for reducing the ill effects of living in a sexist world? **E. Newell, J. Thomas.**

4:35-5:05 p.m.

37. The role of nurse practitioners for advancing the patient-centered medical home model for primary care in a free medical and dental clinical for the working uninsured. **K. Hirthler, E. Lucas.**

5:10-5:40 p.m.

38. Success in the absence of tradition: The culture of a non-traditional school. **P. Reinert.**

5:45-6:15 p.m.

39. Survivin downregulation by α-santalol is not mediated through PI3K-Akt pathway in human breast cancer cells. **A. Bommareddy.**

Wednesday, March 29 — Posters

Location: Cohen Lobby
5-7 p.m.

40. Early detection of Alzheimer's disease in model mice. **G. Harms,** A. Piavis, E. Sites, M. Barscheski, C. Musselman, J. Parfianowicz, M. Rivera, M. Batt.

41. Obstacles and successes in implementing kangaroo care for neonates in rural Africa. **S. Noon,** L. Winkler.

42. A synthetic biological approach to treating calcium oxalate kidney stones. **K. McHale, A. Seman, M. Yatison, K. Hiryak,** A. VanWert, D. Lucent, W. Terzaghi.

43. The implications of pharmacy school enrollment and subsequent pharmacist supply on pharmacist salaries. **S. Kheloussi,** C. Bright, V. Shah, R. Seeley.

44. The stress of responsibility: Activism mediates the relationship between endorsement of feminist ideology and perceived stress. **C. Barat,** L. Marvin, J. Thomas, E. Newell.

45. Persistent homology for analysis of hyperspectral movies. **S. Chepushtanova.**

46. Computational enzyme design using the empirical valence bond method. **J. Brown,** D. Sales, D. Lucent.

47. Topological analysis of protein dynamics using persistent homology. **N. Rentschler,** M. Notaro, S. Chepushtanova, D. Lucent

48. What inspires activism? Feminism mediates the relationship between critical reflection and critical action. **J. Thomas,** E. Newell, S. Gnall, L. Kessler, N. Solomon.

49. Survivin downregulation by α-santalol is not mediated through PI3K-Akt pathway in human breast cancer cells. **J. Steigerwalt, T. Landis,** K. Crisamore, S. Brozena, A. VanWert, A. Bommareddy.

50. Developing a CHO cell line expressing an inducible colonic oxalate transporter, SLC26A3. K. McHale, J. Hensley, K. Hiryak, D. Lucent, W. Terzaghi, M. Torsiello, A. VanWert, **M. Venditto.**

Thursday, March 30 - Posters and Reception

Henry Student Center Ballroom Lobby
4-6 p.m.

51. Ecotypic differences in the phenology of the tundra species Eriophorum vaginatum reflect sites of origin. **N. Fetcher,** T. Parker, J. Tang, M. Clark, M. Moody.

52. Determine *in-vivo* dielectric properties of breast tissues from ex-vivo measurement. **A. Mancini,** A. Sabouni.

53. Cubsat antenna for satellite communication. **F. Alsabr,** M. Alanazi, A. Sheikh, A. Sabban, A. Sabouni.

54. Antenna Tattoo for epidermal electronic devices. **Y. Almangour,** A. Sabouni.

55. Animal-mediated seed dispersal across an urban-rural gradient. **D. Kriebel,** G. Cadigan, S. Moreno, J. Stratford, M. Steele.

56. Long-term patterns of weevil infestation in the fruits (acorns) of two oak species: *Quercus rubra* (red oaks) and *Q. alba* (white oaks). **T. Pintsch,** S. Marino, M. Suchocki, M. Steele.

57. Comparing stability and kinetic properties of oxalate decarboxylase free in solution and tethered to the surface of magnetosomes. **M. Roueinfar,** A. VanWert, D. Lucent, W. Terzaghi.

58. The culture of small businesses in NEPA. **E. Lonstein,** M. Clevenger

59. Establishment of an evidence-based screening criteria for an inpatient clinical pharmacy service focused on transitions of care. **D. Manning, J. Kristeller,** C. Haupt, E. Stambone.

60. Evaluation of medication related problems and errors identified during pharmacist-led medication reconciliation. **D. Manning, J. Kristeller,** C. Haupt, H. Yanoski.

61. Validation of an evidence-based screening process through correlation with medication-related problems detected during evaluation by a clinical pharmacy service. **D. Manning, J. Kristeller,** C. Haupt, E. McGrath.

Thursday, March 30 – O'Hop Final Word Lecture

6-7:30 p.m.

Henry Student Center Ballroom

"Future Technology for Breast Cancer Imaging, Detection, and Monitoring Treatment"

Abas Sabouni, Ph.D.
Assistant Professor of Electrical Engineering

Microwave imaging technology has recently been suggested as a new imaging modality for the characterization, monitoring, and treatment of breast cancer. The potential benefits of microwave imaging for breast cancer detection lie in its non-ionizing nature, low power levels of illumination, low cost and the fact that breast compression may not be required. The method relies on the contrast between the electrical properties of the tumor and those of the normal tissue. In this technique, the microwave signals penetrate into the body, and structural and functional information of the tissues is extracted from the scattered and reflected signals. It provides information about different tissues at different states in the form of quantitative images, which can be used for diagnosis (e.g. cancer). The presentation will focus on experimental efforts of Dr. Sabouni's research group in the area of low-power microwave tissue monitoring. We will provide a general overview of microwave medical imaging techniques and will highlight recent progress in microwave imaging technology. We will share our experience in the challenges of the image construction algorithms and hardware set up as well as wireless sensor development to monitor the re-grow of the cancer in order to increase the quality of the life for breast cancer survivors.

Dr. Abas Sabouni joined the Department of Electrical Engineering and Physics at Wilkes University in 2013. He received his doctorate in electrical and computer engineering from the University of Manitoba, Winnipeg, Canada, in 2011. From 2011 to 2013, he was a post-doctoral fellow in the Biomedical Engineering Department at the Ecole Polytechnique de Montreal and Montreal Neurology Institute, as well as research associate at the Department of Electrical and Computer Engineering at Concordia University, Montreal, Quebec, Canada.

In summer 2014, he conducted research at the University of California San Diego as a visiting scholar and initiated the development of a novel technique for neurotransmitter imaging. Between 2001 and 2004, he was a research and development engineer at PartoDadeh Company. During 2005 and 2006, he was a research assistant in the Electromagnetic Group at University of Manitoba, and a research associate at CancerCare Manitoba in Winnipeg, Canada. From 2006 to 2009, he was a research and teaching assistant and lecturer at the Department of Electrical and Computer Engineering at the University of Manitoba. From 2009 to 2010, he was a research associate in the Department of Electrical Engineering, University of North Dakota, Grand Forks, N.D.

He has authored over 60 peer-reviewed journal and conference papers presented at international conferences and published in scientific journals. Dr. Sabouni received an honorable mention in the IEEE AP-S Student Paper Contest in 2008, NSERC Canada Industrial Research and Development Fellowship (Pre-approval) in 2011, and FQRNT Canada Postdoctoral Fellowship Award in 2013. From 2010 to 2013, he was the chair of IEEE Montreal Antenna Propagation Chapter.

In 2014, he received an outstanding interdisciplinary teaching award from Wilkes University for his engagement in interdisciplinary projects across departments and developing interdisciplinary courses.

ABSTRACTS

1. Using synthetic biology to engineer cyanobacteria that remediate atrazine. T. Wasiluk, G.P. Queen, W. Terzaghi, D. Lucent.

Atrazine contamination has become a concern due to its long half-life and reports that it acts as an endocrine disrupter. Bioremediation is one way to alleviate atrazine contamination. TrzN, an atrazine chlorohydrolase found in several species of soil bacteria, initiates the degradation of atrazine by converting it to the less toxic product hydroxyatrazine. The aim of this project was to create transgenic Synechococcus elongatus PCC 7942 expressing TrzN for phytoremediation of atrazine. Genes encoding TrzN were transformed into S. elongatus and the transgenic cultures and their tolerance of 1μM atrazine was compared to that of wild type. S. elongatus cultures expressing TrzN were found to be significantly more atrazine-tolerant than wild type and mutant TrzN cultures in terms of growth and photosynthetic ability, showing that this tolerance was due to the TrzN transgene.

2. Next-generation lesson planning: Translating preservice secondary science teachers' research into lesson plans. D. French.

The Next Generation Science Standards call for teachers to incorporate science and engineering practices along with core standards to provide a more authentic science learning experience. This exploratory study highlights the successes and struggles of translating preservice secondary science teachers' undergraduate science research projects into standards-based lesson plans showcasing the process of authentic scientific inquiry (ASI). Two preservice high school and one preservice middle school teacher participated in this study. Because the middle school preservice teacher did not have a senior research project, this student used archival data to create a standards-based ASI project. A brief overview of the project will be presented. Successes, lessons learned, and changes in preservice science teachers' perceptions of ASI pre- to post-instruction will also be highlighted.

3. Two novel non-coding RNA molecules that have unexpected roles in controlling plant development. W. Terzaghi, B. Morocho, M. Yuhas.

Traditionally RNA is thought to act as the instructions for making proteins that perform various functions; however, an increasing number of RNA molecules (non-coding RNAs) are being discovered that act directly in various processes. We have identified two non-coding RNAs that appear to participate directly in regulating plant growth and development because mutants that do not make these RNAs show significant differences. Mutant 121071 had a larger biomass than wild-type when grown on 1% glucose and displayed severely delayed germination when sown on 5% glucose. Transformation with the wild-type ncRNA coding sequence restored the wild-type phenotype. We found that overexpression of ncRNA 121071 did not enhance the phenotype, whereas transformants expressing this ncRNA at lower levels than wild-type displayed intermediate phenotypes. These results suggest that the ncRNA 121071 is involved in sugar signaling. We therefore compared the expression of genes known to be involved in sugar sensing in 121071 mutants and wild-type and found that HEXOKINASE gene expression was elevated in mutants grown on 5% glucose relative to wild type whereas other genes such as TOR and downstream signaling genes were not obviously affected. NcRNA mutant line 024279 grew much larger than wild-type (wt). It also displayed precocious germination relative to wild-type. In particular, it displayed 100% germination after 7 days in the dark, compared to less than 2% in wild-type. We are presently transforming the wild-type sequence back into the mutant to see whether this will rescue the mutant phenotype.

4. The relationship of local leaders and business institutions with entrepreneurs in NEPA. B. Heim, M. Clevenger.

This study focuses on the relationship of local leaders' and business mentoring/aid institutions' presence and interaction within a community on local entrepreneurs. Our hypotheses are: (1) local leader and business Institution presence and interaction will have a significant, positive relationship with each dependent variable individually, (2) urban areas will have a higher presence of and interaction with local leaders and business institutions than suburban, small town, and rural areas, (3) local leaders and business institutions that are present and interactive in the community create a stronger entrepreneurial community. A sample of 375 entrepreneurs from northeastern Pennsylvania were used in this study.

5. Psychological safety as a critical component of higher education student success. A. Burns, B. Mackesy.

Psychological safety is a key element for students in K-12 institutions. Furthermore, research has shown the value of providing a socially and emotionally safe learning environment for college students as well. During this presentation, I will introduce Thomas

Hoerr's concept of "The Formative Five," skills that learners need in order to succeed outside of academia. In addition, I will explore ways to create a learning environment that builds and strengthens these skills specifically for college students. A discussion regarding best practices for creating psychological safety in a college environment will be part of the presentation.

6. Obstacles and successes in implementing kangaroo care for neonates in rural Africa. L. Winkler, S. Noon.

This research examines maternal morbidity, mortality (MMR) and perinatal mortality over a multiyear period in rural Tanzania at Nyakahanga District Hospital. This hospital services an area of approximately a million people. The study uses a retrospective medical record research design involving de-identified obstetric labor logs. These obstetric records are analyzed for obstetric outcomes, maternal complications, neonatal status, and types of delivery for 2009-2014 (N=15772). Data has been collected over 12 weeks in 2013-2016. Results indicate noteworthy improvement with MMR approximating the national average despite ongoing gaps in staffing needs. The improvements seen in maternal mortality can be attributed to multiple hospital initiatives in staff training and procedure to improve service. C-section rates are elevated as are neonatal deaths in these procedures relative to vaginal births. Maternal complications are equivalent to global averages although some may be related to delays in obstetric delivery. Neonatal mortality is elevated relative to Tanzania averages. Neonatal deaths are correlated with maternal age and type of delivery. It is recommended that antenatal initiatives be expanded to encourage multiparous women to seek skilled care especially at the sign of any complications.

7. Assessing the fluoro-stabilization effect using in vivo unnatural amino acid incorporation. C. Henkels.

In vivo unnatural amino acid (UAA) incorporation extends the allowable range of chemical functionalities that can be used to probe site-specific structure-function relationships; one set of compounds includes fluorinated UAAs (F-UAAs). F-UAA incorporation may be a useful strategy in protein design given fluorine's unusual physicochemical properties, minimal structural perturbation and enhanced polypeptide stability upon F-UAA substitution. Understanding the thermodynamic basis of the "fluoro-stabilization effect" is currently an active field of research. While most studies have used F-UAA-containing polypeptides generated by solid-phase peptide synthesis (< 60 residues), we have developed a systematic study to examine the magnitude and molecular basis of fluoro-stabilization using an array of *in vivo* translated F-UAA-containing single-site superfolder green fluorescent protein (sfGFP) variants. Interestingly, preliminary denaturant equilibrium unfolding experiments suggest that fluorocarbon bond substitution *de*stabilizes sfGFP in a position-dependent manner. This atypical result may have intriguing implications for the denatured state of fluorinated sfGFP variants, as spectroscopic evidence suggests that F-UAA substitution at either solvent-exposed substitution site does not affect native sfGFP secondary or tertiary structure.

8. Creative non-fiction. B. Culver.

Since the opening of Wilkes University's M.A./M.F.A. program in Creative Writing in 2005, the fastest-growing area of study is nonfiction: memoir, essay collections, travel narratives, and biography. However, it is the memoir that draws the most interest among current students who have embraced the label of creative writing to best describe their work. But what is "creative" nonfiction and how is it the same and different from fiction and nonfiction? What legal issues face writers who choose to write about their lives and their interactions with others? What is "truth" in a memoir when it borrows from the basic elements of fiction that create a narrative, a story that holds its readers just as fiction novel does? This presentation will explore those contrasts and comparisons while the presenter shares some of her own creative nonfiction work in this area as an illustration of this highly popular form.

9. Cell signaling, gene regulation, and development: Using *Drosophila* to study epidermal growth factor receptor signaling target genes. L. Kadlec.

Broadly speaking, I am interested in cellular signaling pathways and the roles they play both in normal development and in abnormal situations such as cancer. Research in my laboratory focuses on a specific signaling pathway, the epidermal growth factor receptor (Egfr) pathway, and its roles in the regulation of gene expression during development, using the fruit fly *Drosophila melanogaster* as a model system. Signaling by Egfr family members has been shown to be essential for the development of many organisms including fruit flies, nematode worms, and mice. In *Drosophila*, for example, Egfr plays important roles in many aspects of development, including oogenesis, embryogenesis and proper development of both eyes and wings. Understanding

the regulation and the targets of this pathway in a model organism such as *Drosophila* not only increases our understanding of fly development, but can also provide insights into the workings of similar pathways in "higher" organisms (e.g., mammals), where unregulated signaling can contribute to cancer. DNA microarray screens, which allow us to look at the expression of every gene in an organism's genome in a single experiment, have been used to identify a number of potential novel pathway targets, i.e. genes whose expression increases when levels of signaling increase. My current research employs a variety of molecular, cell biological, and genetic techniques to investigate the expression, biological function, and mechanism of action of a number of putative genes of interest, focusing primarily on genes of previously unknown function.

10. Entrepreneurial communities: Highlights from NEPA. M. Clevenger, E. Newell, M.W. Fortunato.

This presentation highlights results from a mixed-method research project, which discusses important factors in entrepreneurial communities, including concepts such as local leadership, politics, culture, and the entrepreneurial environment.

11. Green Hill: euphonium solo. E. Fowler, P. Simon.

12. Working life with language: Four voices. M. Anthony, L. Kuhar, M. Cordisco, C. Santo.

Four writers in different stages of career share original work and discuss their craft.

13. Real-time monitoring and stimulation of the brain. A. Sabouni.

Transcranial Magnetic Stimulation (TMS) is a technique that uses intense pulsed magnetic fields to induce currents in neuronal tissues that produce therapeutic effects in the brain. This system is an FDA-approved treatment for patients suffering from depression who have not achieved satisfactory improvement with antidepressant medication or who did not tolerate antidepressant medications. In this presentation, we will present development of a real-time, high-resolution, noninvasive system for neural stimulation, brain mapping, and studying the function of the central nervous system in greater detail than is possible today.

14. Spirits in the modern world: Malaysian women's ways of knowing. G. Morrison.

This 2016 study investigated spiritual beliefs among women of Malaysia, a developing nation unique in its racial and religious diversity, to ascertain some of the spiritual beliefs that guide behavior. Specifically, it investigated Malaysian career women who are often depended upon to reconcile home life in a culture where spiritual beliefs are widely accepted, with careers in a global marketplace where western bias leads to more restrictive views of religion and spiritualism (Dinç, 2007). The lens of gender (Bem, 1993) framed the study because it was theorized that women's "ways of knowing" (Belenky, et al., 1997) might provide connections to spiritual belief systems and issues involved in maintaining family well-being. Twenty-two working women aged 21 to 78 from urban and rural backgrounds were interviewed, from all sectors of society, with educational levels ranging from secondary school to terminal degree: Malay, Indian, Chinese and tribal women of Muslim, Hindu, Christian, Buddhist and Pagan belief systems. In spite of this diversity, their shared understanding of and respect for the rules of the spirit world emerged as the most salient finding, even among the few reporting that they themselves did not believe. The discussion of the findings includes possible underlying factors, such as differences between eastern and western modernities (Dinç, 2007), the postulation that a rise in spirituality might be a reaction to Malaysia's nationalistic drive to modernize (Cheu, 1996/97; DiBernardi, 2006; Goh, 2016), and the consideration of the existence of a spiritual world to which some cultures are more connected than others.

15. Detection of cervical spondylotic myelopathy using a noninvasive microwave imaging technique. S. Al Muqatash, A. Sabouni.

In this paper we will present a newly developed noninvasive diagnostic method for cervical myelopathy detection using the microwave imaging technology. In this technique, the neck will be illuminated by the magnetic waveform using a UWB antenna. Then the scattered field by the neck will be measured by the receiver UWB antennas at various locations around the neck. We have simulated a simple model of a neck for detecting cervical myelopathy using CST software. The computed results demonstrate the high feasibility of using microwave technique to diagnose the cervical myelopathy.

16. Analysis of vegetation communities within natural gas pipeline corridors of northeastern Pennsylvania. A. Campisi, C. Gregory, C. Heid. K. Klemow, **J. Youkoski.**

Unconventional natural gas development has been rapidly proceeding in Pennsylvania for the past

decade. Transporting gas to market requires the build-out of a projected 30,000 miles of natural gas pipelines over the next 20 years, fragmenting forests throughout the state. Conservationists are concerned that pipeline corridors represent likely avenues for the spread of alien and invasive plant species into areas currently dominated by native forests. A several month project coinciding with the construction of the Transco Pipeline in portions of Luzerne County, Pa., called for an assessment of vegetation at the construction site and in three other sites unaffected by construction. The plants at each site were identified and percent covers assessed within 1m x 1m plots along transects set up within seven separate pipeline corridors arrayed in the four sites. The transects and plots were set up to include environmental diversity in the form of differing soil textures, slopes, and degree of waterlogging of the soils. Analysis of the data showed an unexpectedly high level of species diversity, with two dominating species (rough goldenrod and swamp dewberry), and a small percentage (<5%) of alien species. Statistical analysis revealed several community types, including mixed meadow, heath, and wetland. Future research will examine the degree to which soils and other physical features (slope, rock outcrops) impact plant community composition. This research will inform future attempts to revegetate pipeline corridors to enhance their ecological features.

17. Characterization of novel epidermal growth factor receptor target genes implicated in *Drosophila* development. A. Morgan, L. Kadlec, **N. Seabridge, Z. Walter.**

Cellular signaling pathways play multiple roles in the normal development of all multicellular organisms. Signaling by members of the epidermal growth factor receptor (Egfr) family has been shown to be essential for the development of many organisms, including fruit flies, worms, and mice. In *Drosophila*, for example, Egfr plays important roles in many aspects of development, including oogenesis, embryogenesis and proper development of both eyes and wings. Understanding the regulation and the targets of this pathway in a model organism such as *Drosophila* not only increases our understanding of fly development, but can also give us insight into the workings of similar pathways in "higher" organisms (e.g., mammals), where unregulated signaling can contribute to cancer. Results from a previously performed microarray screen which compared gene expression in fly ovaries in which the activity of the pathway was either reduced or constitutively active, identified a number of potential novel pathway targets. These are genes whose expression increases when levels of signaling increase. We have employed a number of approaches to further investigate the expression, biological function, and mechanism of action of these putative genes of interest, focusing primarily on genes of previously unknown function. *In situ* hybridization was used to look at mRNA localization of target genes, and UAS-RNAi (RNA interference) was used to knock down expression in either specific tissues or throughout the organism. Several target genes exhibit developmentally regulated expression in ovaries and gene knockdown phenotypes include a variety of eggshell defects and, in at least one case, lethality.

18. Determining sex-based differences in resveratrol and piceid production by Japanese knotweed. A. Ford, K. Klemow, **J. Luchetta,** D. Mencer, **A. Mikolon, D. Pupaza,** W. Terzaghi, **M. Yatison.**

Japanese knotweed (*Fallopia japonica*) is an invasive plant species found across the United States. It produces large amounts of resveratrol and its glycosylated derivative piceid, which are proposed to confer numerous health benefits. Japanese knotweed is unusual in having separate male and female plants. In this study we are measuring differences in resveratrol and piceid production by males and females, and cataloging the amounts of these two chemicals found in various parts of the plant. In preliminary studies, male and female plants were collected from several locations in Luzerne County. Resveratrol and piceid were extracted using 80% ethanol and analyzed using HPLC followed by UV and Mass Spec (MS) detection. Resveratrol and piceid were detected in both males and females, with the highest concentrations in the rhizomes. Significantly higher concentrations were detected in the males than in the females. We also conducted a preliminary evaluation of the potential role of genetic variation in resveratrol production using primers shown by other workers to amplify genomic and plastidic DNA polymorphisms. Four of these primer pairs showed differing patterns between several of the samples that also displayed large variation in resveratrol content. It is known that UV exposure of the trans isomers of resveratrol and piceid photoisomerizes both compounds creating the cis isomers. We have preliminary data demonstrating that trans-resveratrol can co-elute with cis-piceid during HPLC separations. Since piceid is often present at much higher concentrations than resveratrol, reported concentrations for trans-resveratrol from HPLC methods may be erroneously inflated when cis-piceid is present.

19. Synthesis and characterization of a copper-based macrocyclic chelate for quantitation and sequestration of oxalate, the major component of kidney stones. J. Hensley, K. Hiryak, **D. Hontz,** D. Lucent, W. Terzaghi, **M. Torsiello,** A. VanWert, M. Venditto.

Background: Eighty percent of kidney stones are calcium oxalate-based. Oxalate is found both in diet and synthesized in the liver. Furthermore, blood-borne oxalate appears to undergo entero-enteric recirculation via transporters in the small intestine (secretory) and colon (absorptive).
Objective: We aimed to synthesize a small-molecule oxalate binder to serve a dual purpose: (1st) to be employed in a quantitative fluorescence-based oxalate assay, and (2nd) to prevent colonic oxalate absorption.
Methods & Results: We optimized the synthesis of a copper-based chelate (~70% yield) and expanded characterization beyond literature reports: (1) for the first time, we crystallized the chelate and determined its lattice as primitive triclinic via X-ray crystallography; (2) for the first time, we obtained NMR spectra of the chelate; (3) we obtained mass spectra of the two intermediates, showing excellent purity; (4) we confirmed the ability of the chelate to quench eosin Y fluorescence, and to release eosin Y upon oxalate binding; and (5) we have, for the first time, determined that citrate can also give a positive fluorescence response, unlike other acids.
Conclusion: The chelate can be produced inexpensively with high yield and purity. Its crystal structure helps to predict the binding orientation of oxalate. We have found, for the first time, that although the compound is selective for oxalate, it is not specific. Collectively, these findings indicate that the chelate will serve as a useful tool for quantifying oxalate. Furthermore, evaluating the chelate as prophylaxis for oxalate kidney stones is becoming a promising goal.

20. Food web ecology in northeast Pennsylvania grasslands: Insights from stable isotopes. N. Fetcher, T. Holleran, E. Rider, A. Schall, C. Shonk, **J. Stratford,** M, Suchocki.

Grasslands and other early successional habitats are rapidly declining across eastern North America. In Pennsylvania, grasslands are managed using a variety of strategies, which has resulted in grasslands that vary in their plant composition. Most notably, plant composition ranges from sites dominated by warm-season grasses to sites with a complete absence of warm season grasses. Consequently, these habitats provide an excellent system for ecological research. We sampled plant productivity and diversity in 17 grasslands in northeast Pennsylvania. Productivity and diversity varied markedly across sites, but those sites with the highest and lowest productivity were associated with lowest diversity. On the other hand, sites with intermediate productivity were associated with the highest diversity of plants and birds. Food webs of 5 sites were analyzed using stable isotopes of carbon and nitrogen. The lower trophic levels of food webs utilized cool season grasses, forbs, and shrubs more than the warm-season grasses. Although warm-season grasses have been recently favored by land managers, our results suggest that land managers should temper their enthusiasm and manage grasslands with a variety of plant types.

21. Women in entrepreneurship: A literature review. A. Batory, M. Clevenger, M. Lehman, **E. Meinhart,** S. Reinhardt.

This poster highlights key literature relating to women in entrepreneurship with a generational contrast over the past 100 years. The work is being used for a new research project in PA.

22. Entrepreneurial communities: How education matters. M. Clevenger, **D. Graff.**

This poster will highlight background terminology related to entrepreneurial communities, including concepts such as entrepreneurial ecosystems, classification of business size, and entrepreneurial education. In addition, descriptive statistics as well as empirical data findings will be presented to support two hypotheses relating to entrepreneurial education.

23. Biogeographic variation in insect-acorn interactions: Tolerance vs. resistance in an animal-dispersed plant. K. Schafer, M. Steele, J. Stratford.

Plants that depend on animal-mediated dispersal produce seeds that both attract dispersal agents and allow resistance and/or tolerance to seed predators. The oaks, for example, produce acorns that have little physical defense, are high in lipids, but are also high in defense compounds (tannins). Previous work from our lab shows that chemical gradients in acorns (e.g., higher nutrient and fat, and lower tannin levels) direct insect, bird and mammal damage away from the embryo, allowing partially consumed seeds to germinate and establish. In this 6-year study, we investigated variation in insect predation in the acorns of *Quercus rubra* and *Q. alba* across a latitudinal gradient extending from NY to NC. Contrary to our predictions, we find that insect infestation is higher in northern latitudes. We also find that insect damage (from *Curculio* larvae) is significantly higher in the basal half of acorns across this latitudinal gradient

and that the chemical gradients within acorns generally correlate with this pattern of seed predation. We conclude that due to specific characteristics (seed size, seed chemistry), acorns have evolved a combined strategy of tolerance and a resistance, that allow them to successfully germinate, even after attacked by seed predators.

24. I've got this: Perceived control mediates the relationship between stress and entrepreneurial success. D. Jolley, E. Newell, M. Clevenger.

Entrepreneurs are at risk for high rates of stress and lower well-being when compared to other workers (Heaphy & Dutton, 2008; Rahim,1996). Some, however, have argued that the stress of being an entrepreneur can be an asset. Cardon and Patel (2015) reported that stress may serve an important function for entrepreneurs because it can stimulate motivation to achieve (e.g., Goodman, 2008). The current research sought to further understand the relationship between stress and success among entrepreneurs. Specifically, we examined another factor known to help reduce the negative effects of stress – perceived control (e.g., Lachman & Weaver, 1998; Thompson & Prottas, 2005). We hypothesized that perceived control would mediate the relationship between perceptions of stress and entrepreneurial success. Entrepreneurs (n = 356) from a rural northeastern state participated in a study about understanding entrepreneurial communities. Participants completed measures of Perceived Stress, Business Success, and Perceived Control. We used PROCESS (Model 4; Hayes, 2013) to assess our mediational hypothesis. As hypothesized, stress negatively predicted business success among entrepreneurs. Perceived control, however, significantly mediated the relationship between stress and business success. These data suggest that perceived control may be one mechanism that allows entrepreneurs to flourish even as they experience high levels of stress within their work.

25. Evaluating the use of standardized patients in an advanced physical assessment distance education course during a nurse practitioner residency. M. Miskovsky, P. Sweeney.

Nurse Practitioner (NP) education is continually evolving to meet the needs of an ever-changing health care environment. Faculty must develop innovative approaches to deliver this education. Developing teaching strategies can be challenging and complex when delivering education in a distance education format. Standardized Patient (SP) experiences are used to evaluate assessment skills, therapeutic communication, differential diagnosis, and to prepare students for the clinical setting. Research suggests that using SPs decreases student anxiety, improves assessment and communication, increases self-confidence, and enhances critical thinking. Integrating SPs into a graduate physical assessment class may better prepare the advanced practice nursing student for clinical and the "real world" experience. As more NP programs develop partial or fully online courses, there are few studies that describe the use and impact of SPs in distance education NP programs that use a required intensive for the purpose of competency testing using SPs. The purpose of this descriptive study was to explore each student's self-confidence in assessment skills and satisfaction with the implementation of SPs after the two-day residency. A convenience sample of 24 participants completed the *Student Satisfaction and Self Confidence in Learning Survey* after attending the campus residency. Findings suggest that students were satisfied with the SP experience and that the use of SPs was a realistic, enhanced learning and improved confidence in knowledge and skills. Narrative comments enforced the survey results. Recommendations are made for additional research, using a larger sample size over several semesters and using additional outcome measures of effectiveness.

26. Pennsylvania public school-based mental health rights of adult students. S.R. Phillips, B. Mackesy.

School-based mental health services are affected by legislation at federal, state, and local levels. Laws protect access to student files and outline requirements for the provision of information for parents and students. In the intersection of federal law, state educational code, and school board policy, there remain gaps that can inhibit access to services, especially by students that are adult aged but remain in a public education setting. Clearly articulated guidelines at the local level can bridge mandates by making discretionary decisions that permit students access to the help they need, especially once they have reached the age of 18.

27. Virtues for affective engines. C. Zarpentine.

The account of practical reasoning traditionally associated with virtue ethics has been criticized on the grounds that it is at odds with what empirical research tells us about the cognitive and motivational processes involved in the production of human behavior. Here I advance an alternative account of these processes: affective engine theory. On this view, affective mechanisms play a key role in human agency. Importantly, they sustain a kind of *evaluative* perception that guides action. And while they exhibit

a significant degree of automaticity, they can also be shaped and modified over time, allowing for a kind of *diachronic supervision*. I discuss a conception of practical reasoning complementary to affective engine theory. I then argue that, by adopting a conception of virtue ethics according to which the virtues are those character traits necessary for excellence in practical reasoning, affective engine theory can provide the basis for generating a novel nontraditional virtue ethics: a theory of virtue for affective engines.

28. Topological analysis of protein dynamics using persistent homology. S. Chepushtanova, D. Lucent, M. Notaro.

The data acquired from protein dynamics simulations is complex (having thousands of variables) and large (each variable is sampled hundreds of thousands of times). Although not yet considered as a conventional data mining problem, we consider the tools developed in recent years for analysis of other large datasets to be excellent tools for analysis of these simulations. In particular, we believe that computing persistent homology will allow us to distill this vast amount of information into physically meaningful features based on the lifetimes of certain shapes and patterns in the simulation data. In this project we evaluate persistent homology barcodes as a means of analyzing protein simulation data. The results will be compared to other standard analysis techniques to determine the efficiency of our method both in terms of computational cost and ability to discover new features in the data.

29. Teacher education for social and emotional learning environments. J. J. Mao, D. Polacheck, E. Schicatano, E. Maculloch, M. Callagy.

Social and emotional learning (SEL) emphasizes five interrelated domains based on cognitive, affective, and behavioral competencies as well as attitudinal and behavioral outcomes; and these five competency domains include self-awareness, social awareness, self-management, relationship skills, and responsible decision-making (Weissberg, Durlak, Domitrovich, & Gullotta, 2015). This research project focuses on the following objectives: (1) Examine preservice teachers' self-awareness, self-management knowledge, and other SEL competencies after using MUSE, a tool for meditation and mindfulness training; (2) Explore preservice teachers' general pedagogical knowledge about SEL; (3) Explore preservice teachers' perspectives on SEL practices of the schools where they completed the required practicum and student teaching field work. One future goal based on these objectives is to collaborate with researchers and school leaders in Pennsylvania and make systematic changes in education through research and development. The project is recently funded by the university and it is still in the development stage with many details to be finalized for the research procedure. This presentation will be an introduction to the team members and a summary of part of the preparation work for the two-year research project that is recently funded. The presenters will also share related literature on both research and best practices in teacher education, and social and emotional teaching and learning.

30. A structured education program for community dwelling older adults. L. Pajalich.

This presentation focuses on a pilot project to prevent falls and fall-related injuries by increasing patient awareness. The aging community dwelling population, like the general population, is at risk for falls and fall-related injuries whether at home, in hospitals or in long-term care facilities. The project outcomes can potentially impact health policy on the local level and strengthen the healthcare organization within the community and nation. Project outcomes can be beneficial in impacting public health policy across many areas. Advanced practice nurses (APN) are leading practice innovations to systematically assess patients' risk for falls and implement community population based prevention interventions. The fall prevention program was delivered using a combination of approaches available approaches from the literature.

31. Design and validation of a low-cost portable device to quantify postural stability. Y. Zhu.

Measurement of the displacement of the center-of-pressure (COP) is an important tool used in biomechanics to assess postural stability and human balance. The goal of this research is to design and validate a low-cost portable device that can offer a quick indication of the state of postural stability and human balance related conditions. Maximum approximate entropy (ApEn) values reflecting the amount of irregularity hiding in COP oscillations were used to calculate the index. The prototype adopts a portable design using the measurements of the load cells located at the four corners of a low-cost force platform. The test subject was asked to stand on the device in quiet normal upright stance for 60 seconds with his eyes open or closed. Based on the COP displacement signals, the maximum ApEn values were calculated. The results indicate that the prototype device is capable of capturing the increase in regularity of sway variability with reduced visual feedback. It is also able to decipher the subtle

postural control variances along anterior-posterior and medial-lateral directions. The data analysis demonstrates that the prototype can be used to quantify postural stability and thus provide a low-cost portable device to assess many conditions related to postural stability and human balance such as aging, diabetes and brain injury.

32. Impact of a discipline model on teacher efficacy and burnout: Perspectives for elementary teachers in Michigan. L. Cooper.

This study examined the impact of Conscious Discipline® (Bailey, 2001) on Michigan elementary teachers' perceptions of self-efficacy and burnout. Teachers completed the Teacher Sense of Efficacy Scale (TSES) and Maslach's Burnout Inventory (MBI) five months after adoption of the program. Also, a fidelity observation was implemented concurrently. Results from this study found no statistical significance in TSES or MBI scores between the treatment and control groups. Additionally, no statistical significance was found in amount of observed implementation level of Conscious Discipline® and efficacy or burnout scores in comparing the treatment and control groups. This lack of significant difference is likely due to disparities found in leadership and school climate between treatment and control group schools.

33. A transfiguration of longing. H. Sincavage.

Exploring the emotional place of togetherness, isolation, and the space between, the body is used as a form of measure of our internal *Self*, in a series entitled, *a measure*. Through a series of live performance and performance-to-video works, completed in Maine, Iowa, and Iceland, mark making on the body or by the body divulges aspects of our humanness felt only by an individual. We cannot tangibly share this experience with another, only describe it. This work looks to quantify our ontological existence in the artwork created, therefore proving its potent authenticity. The influence of landscape is explored as a visual component and influence within the series.

34. Toward entrepreneurial community development: Leaping cultural and leadership boundaries. M. Clevenger, M.W.P. Fortunato.

This presentation previews Drs. Clevenger and Fortunato's new book to be released in April 2017. A macro discussion overviews entrepreneurial community ecosystems and focuses on key facets of leadership, culture, psychology, and complex dynamics.

35. Family business trends and issues in the 21st century: Research in NEPA. M. Clevenger, L. Jordan, J. Alves, E. Newell.

Findings of issues for family businesses will be shared from a grounded theory, ethnographic case study in Pennsylvania of 342 family-owned businesses. The purpose was to explore family business needs and issues in the 21st century. In doing so, we can grasp the knowledge of business owners and how their family dynamics are managed along with their business operations and governance. Key questions included: (1) What are the most pressing issues for family businesses today? (2) What will the next iteration of family businesses have to face? and (3) What variances exist among family businesses based on industry or geography?

36. Is feminism a solution for reducing the ill effects of living in a sexist world? E. Newell, J. Thomas.

In a culture where gender inequality exists, sexism is an ever-present reality for women. Numerous studies demonstrate that sexism is damaging to women's psychological and physical health (Landrine & Konoff, 1997). Scholars postulate that feminism may be protective for women who experience sexism; however, research examining this possibility is limited. To examine this, 171 college-aged women completed questions about feminist beliefs, sexism, activism, and wellbeing. We first hypothesized that activism would mediate the negative relationship between experiencing sexism and wellbeing, but only among those who endorse feminist beliefs (FBs). FBs, however, may also serve as a source of stress for some women. Feminist ideology embraces the commitment to improve women's social status (e.g., Bargad & Hyde, 1991). This can provide women with feelings of empowerment (Yoder et al., 2012); however, feeling responsible for change may also be stressful (e.g., Hodgins et al, 2009). Our second hypothesis examined whether FBs (and their associated demands) can also be stressful for those in the emerging adulthood stage of development (i.e., college-aged individuals). Using PROCESS (Model 4; Hayes, 2013), we will present several mediational models that show support for both hypotheses. Our results suggest that endorsement of FBs can be a double-edged sword for women's wellbeing. Finally, we will present initial research examining the effect of FBs on women's acute psychological and physiological wellbeing in an interaction with a sexist (or not sexist) man. Specifically we will measure women's stress reaction to the interaction via psychological assessments and cardiovascular responses.

37. The role of nurse practitioners for advancing the patient-centered medical home model for primary care in a free medical and dental clinical for the working uninsured. K. Hirthler, E. Lucas.

Volunteers in Medicine (VIM) is the area's only full-time, full-service free clinic providing primary and preventative medical and dental care to low-income, working families of Luzerne County. A patient-centered care model with an interprofessional team of volunteers and staff is employed. The presentation demonstrates how nurse practitioners (NPs) as leaders of primary healthcare services in a clinic setting established an integrated electronic health record system and a behavioral health and wellness center to complete the spectrum of patient-centered comprehensive care services. Nurse practitioner volunteers collaborated on a strategic plan with VIM administrative and staff members to lead the integration of an electronic health record and a comprehensive behavioral health and wellness center. The patient-centered medical home model was applied. Grants were written with contributions by the NPs and funded in excess of $430,000 to aid in achieving the strategic plans for these initiatives.

38. Success in the absence of tradition: The culture of a non-traditional school. P. Reinert.

My research was a qualitative study that examined the application of the principles of the Coalition of Essential Schools on the culture and climate of a non-traditional public secondary school. Findings of this case study revealed the practices, attitudes, customs, and culture of a public school that was guided by the principles of the Coalition of Essential Schools and viewed through the conceptual lens of Blumer's (1964) symbolic interactionism.

39. Survivin downregulation by α-santalol is not mediated through PI3K-Akt pathway in human breast cancer cells. A. Bommareddy.

This study was performed to investigate the anticancer properties of α-santalol associated with the induction of apoptosis in cultured MCF-7 and MDA-MB-231 breast cancer cells. Expression of major proteins were determined using standard Western blot protocol and analyzed by LICOR-Odyssey infra-red scanner. Total protein levels of survivin were confirmed by survivin ELISA kit. Cell viability was assessed by trypan blue dye exclusion assay, and caspase-3 activity was determined by caspase-3 (active) ELISA kit. Pharmacological inhibition of PI3K-Akt did not result in a synergistic/additive increase in cell death or caspase-3 activity caused by α-santalol. The study reveals that survivin downregulation by α-santalol in breast cancer cells is not mediated through the PI3K-Akt pathway.

40. Early detection of Alzheimer's disease in model mice. G. Harms, A. Piavis, E. Sites, M. Barscheski, C. Musselman, J. Parfianowicz, M. Rivera, M. Batt.

Alzheimer's disease (AD) is a leading cause of neural network impairment and is the sixth leading cause of death in the United States for adults and the only cause among the top 10 that continues to increase. The pathogenesis of this neurodegenerative disorder has yet to be fully elucidated. There are currently no known cures for the disease, and the best current hope is to be able to detect it early enough to impede its progress. Currently at Wilkes University, our research on Alzheimer's disease has been attempting to identify murine early onset by whole-brain imaging with retrograde labeling and behavioral analysis to which we have now had some new findings. These studies are very invasive and cannot be performed on humans for diagnosis, but the investigations do place a direct time when neural dysfunction is directly observed and should be important to relate to and to investigate with other biomarkers, such as blood-borne biomarkers that can be performed on humans to detect the early onset of Alzheimer's disease.

41. Obstacles and successes in implementing kangaroo care for neonates in rural Africa. S. Noon, L. Winkler.

This study examined implementation of Kangaroo Mother Care (KMC) at Nyakahanga Designated District Hospital in rural Tanzania after this particular hospital requested the study. The hospital had an average perinatal mortality of 59 (nearly twice the national average) plus 4-20% low birth weight neonates in any given month. Outcomes from six mother-neonate pairs were included in this study. Mothers in this study were provided with education on KMC as part of the hospital education initiative. Infants were weighed daily. In 2016, temperature, feeding schedule, and mother self-monitoring of breast milk extraction were added to the protocol. In 2014, poor outcomes of three pairs were related to inadequate breast milk production associated with poor expression of milk, inadequate breast milk and diminished sucking reflexes. During the summer of 2016, the project implemented manual breast pumps for milk expression in addition to KMC. This intervention led to increased positive outcomes. All infants demonstrated consistent weight gain and mothers produced adequate breast milk in 2016. Our results substantiated the value of KMC as well as

the importance of enhancing breast milk production and encouraging mother's participation in monitoring weight gain and milk production.

42. A synthetic biological approach to treating calcium oxalate kidney stones. K. McHale, A. Seman, M. Yatison, K. Hiryak, A. VanWert, D. Lucent , W. Terzaghi.

80% of kidney stones are crystals of calcium oxalate. In this project we are exploring various ways to remediate kidney stones using synthetic biology approaches. The first is to identify, clone and purify enzymes shown to degrade oxalate, and we have cloned several of these enzymes and are presently characterizing them. A second approach is to attempt creating probiotic bacteria that will degrade oxalate in the human digestive tract. For this end we are creating a strain of *E. coli* that takes up oxalate because we have added an oxalate transporter gene to its genome, and then degrades oxalate because we have added an enzyme that degrades oxalate. We have created bacteria that express two different oxalate transporters and are presently measuring how well they take up oxalate. If they do in fact take up oxalate, our next experiment will be to add the oxalate degrading enzymes, and then measure how effectively they remove oxalate from the environment. If they do prove effective at removing oxalate, our next move will be to test them in mouse models of kidney disease, with the ultimate goal of testing them in humans at risk of developing kidney stones.

43. The implications of pharmacy school enrollment and subsequent pharmacist supply on pharmacist salaries. S. Kheloussi, C. Bright, V. Shah, R. Seeley.

Background: The Bureau of Labor Statistics (BLS) and the Health Resources and Services Administration (HRSA) both project an oversupply of pharmacists by 2025. As supply outpaces demand, economic theory predicts that salaries for pharmacists are expected to fall, which will likely have a detrimental impact on the number and quality of pharmacy school applicants.
Objective: To examine the effect of a growing supply of pharmacists on average pharmacist salaries.
Methods: In this descriptive study, we utilized publicly available information from the BLS and HRSA to assess salaries and demand for pharmacists. Additional data from the American Association of Colleges of Pharmacy was used to analyze workforce trends based on degrees conferred, professional program enrollment, and number of professional pharmacy programs.
Results: Current trends in enrollment, number of degrees conferred, and number of professional pharmacy programs suggest continually increasing numbers of pharmacists have and will continue to enter the workforce until at least 2018. However, over the past several years the growth in total pharmacy school enrollment and the growth in average pharmacist salaries have slowed.
Conclusion: Data suggest the supply of pharmacists in the workforce is steadily increasing, supporting the BLS and HRSA conclusions that there will be a significant oversupply in the coming years. Growth in average pharmacist salaries has slowed over the past several years, likely secondary to increased supply. Further studies are needed to assess salary changes in other areas of pharmacy practice, starting pharmacist salaries, quality of pharmacy school applicants, and incoming pharmacy student salary expectations.

44. The stress of responsibility: Activism mediates the relationship between endorsement of feminist ideology and perceived stress. C. Barat, L. Marvin, J. Thomas, E. Newell.

Being aware that one's group is a target of prejudice can have a negative impact on well-being, especially if a person strongly identifies as a member of that group (McCoy & Major, 2003). This effect may be exacerbated for feminist women because a key component of the feminist ideology is the understanding that it will take effort (i.e., activism) to help reduce sexism and discrimination that many perceive towards women (hooks, 2000). Feminist ideology embraces the commitment to improve women's social status (e.g., Bargad & Hyde, 1991). This can provide women with feelings of empowerment (Yoder et al., 2012); however, feeling responsible for change may also be stressful (e.g., Hodgins et al, 2009). We hypothesized that activism for the benefit of one's gender group would be a source of stress among those who embrace feminist ideology. 171 undergraduate women completed measures of Feminist Ideology, Gender Based Activism, and Perceived Stress. To examine the hypothesis that the association between Feminist Ideology and Perceived Stress is mediated by Gender Based Activism we used PROCESS (Model 4; Hayes, 2013). As predicted, endorsement of Feminist Ideology was positively associated with activism and Gender Based Activism was positively associated with Perceived Stress. The indirect effect of Feminist Ideology on Perceived Stress via Gender Based Activism was significant, indicating that the association between endorsement of Feminist Ideology and Stress is, in part, due to

Gender Based Activist actions. Feminist Ideology's negative effect on stress, however, may be explained by our participants' status as emerging adults.

45. Persistent homology for analysis of hyperspectral movies. S. Chepushtanova.

Many data sets can be viewed as a noisy sampling of an underlying topological space. Topological data analysis aims to understand and exploit this underlying structure for the purpose of knowledge discovery. A fundamental tool of the discipline is persistent homology (PH), which captures underlying data-driven, scale-dependent homological information. A useful representation of this homological information is a PH barcode or persistence diagram (PD). There has been considerable interest in applying PH to the analysis of data in a variety of applications, including image webs, signal analysis, neuroscience, and biological aggregations. One application of PH, characterizing information in hyperspectral movies, i.e., sequences of hyperspectral data cubes evolving in time, is considered in this project.

46. Computational enzyme design using the empirical valence bond method. J. Brown, D. Sales, D. Lucent.

Although recent breakthroughs in computational enzyme design have led to the synthesis of new biocatalysts, these nascent methods are currently limited by their high false positive rate and the low catalytic power of their active designs. While necessary for computational efficiency, many of the approximations used in this strategy may be limiting its ability to produce highly active enzymes. Molecular dynamics methods, in particular the empirical valence bond method, offer the ability to circumvent many of these approximations. The EVB method is a semi-classical technique that combines parameters from gas-phase reaction energetics with enhanced sampling techniques to produce a potential of mean force for a given enzyme- catalyzed reaction. EVB calculations have previously yielded excellent quantitative predictions of catalytic effects and as such, are likely to be of great utility both for screening designed enzymes and elucidating what regions of sequence space future designs should explore. Here we implement the EVB method in the high performance molecular dynamics library OpenMM and benchmark the method using a number of standard chemical reactions and explore its utility for computational enzyme design.

47. Topological analysis of protein dynamics using persistent homology. N. Rentschler, M. Notaro, S. Chepushtanova, D. Lucent

The amount of complex information we gather vastly outpaces our ability to extract knowledge from it. This is particularly true for the study of life's building blocks: proteins. Unfortunately, simulating the physics of protein motion yields trajectories possessing thousands of variables and data points. We aim to use a relatively new data science technique known as persistent homology to uncover natural patterns in protein data. We propose to simulate protein dynamics and apply persistent homology to the resulting trajectories. We hypothesize that topological feature called Betti numbers correspond to physical meaningful protein motions yielding better protein thermodynamics and kinetics models.

48. What inspires activism? Feminism mediates the relationship between critical reflection and critical action. J. Thomas, E. Newell, S. Gnall, L. Kessler, N. Solomon.

Activism provides a voice for those who are marginalized and oppressed, and serves as a vehicle of change for unjust and oppressive social conditions (Freire, 2000). Critical consciousness (CC) refers to examining one's social conditions, recognizing that inequity exists, and taking action to overcome perceived injustice. CC postulates that critical reflection (CR) will lead to critical action (CA; Diemer & Rapa, 2016). CR refers to the process of learning that social inequalities exist and constrain opportunities. It was hypothesized that those who perceived greater personal discrimination based on gender (CR) would also engage in more CA. Identification as a feminist (FI) may also account for why individuals engage in CA. Feminists participate in more gender-based activism than do nonfeminists (Zucker, 2004). And those who have been educated about feminism are more likely to participate in CA (Liss et al., 2004). Our second hypothesis followed that FI would mediate the relationship between CR and CA. College students (N=266) reported on perceptions of gender-based discrimination (CR), participation in gender-based and political CA, and FI. Findings support CC. Those who reported greater discrimination based on gender also participated in more gender-based and political CA. Education, or thinking critically about one's social conditions, represents an important pathway to empowering individuals to make social change. Furthermore, FI mediated the relationship between CR and political and gender-based CA. Identifying as a feminist is

one process that explains the positive relationship between CR and CA. FI may provide the motivation and empowerment necessary to take CA.

49. Survivin downregulation by α-santalol is not mediated through PI3K-Akt pathway in human breast cancer cells. J. Steigerwalt, T. Landis, K. Crisamore, S. Brozena, A. VanWert, A. Bommareddy.

This study was performed to investigate the anticancer properties of α-santalol associated with the induction of apoptosis in cultured MCF-7 and MDA-MB-231 breast cancer cells. Expressions of major proteins were determined using standard Western blot protocol and analyzed by LICOR-Odyssey infra-red scanner. Total protein levels of survivin were confirmed by survivin ELISA kit. Cell viability was assessed by trypan blue dye exclusion assay, and caspase-3 activity was determined by caspase-3 (active) ELISA kit. Pharmacological inhibition of PI3K-Akt did not result in a synergistic/additive increase in cell death or caspase-3 activity caused by α-santalol. The study reveals that survivin downregulation by α-santalol in breast cancer cells is not mediated through the PI3K-Akt pathway.

50. Developing a CHO cell line expressing an inducible colonic oxalate transporter, SLC26A3. K. McHale, J. Hensley, K. Hiryak, D. Lucent, W. Terzaghi, M. Torsiello, A. VanWert, **M. Venditto.**

Background: Eighty percent of kidney stones are calcium oxalate-based. Substantial amounts of oxalate are found both in the diet and synthesized *de-novo* in the liver. Furthermore, blood-borne oxalate appears to undergo entero-enteric recirculation via specific transporters in the small intestine (SLC26A6, secretory) and colon (SLC26A3, absorptive).
Objective: In this branch of our overarching project we are exploring ways to prevent intestinal oxalate absorption, rather than methods to destroy oxalate.
Methods: To address this we have developed a tetracycline-inducible Chinese Hamster Ovary (CHO) cell line expressing the major human colon oxalate transporter, SLC26A3. These cells will be used to identify leads for inhibiting colonic oxalate absorption.
Results: RT-PCR and immunoblotting for SLC26A3 in CHO cells demonstrated strong induction with tetracycline and complete absence of expression prior to induction. Oxalate transport was demonstrated upon induction.
Conclusion: We have developed a stable and inducible transgenic cell line that expresses functional human SLC26A3, the colonic oxalate transporter. The cell line will be an essential tool for identifying inhibitors/drugs for this transporter.

51. Ecotypic differences in the phenology of the tundra species *Eriophorum vaginatum* reflect sites of origin. N. Fetcher, T. Parker, J. Tang, M. Clark, M. Moody.

Eriophorum vaginatum is a tussock-forming sedge and a foundation species of moist acidic tussock tundra. Locally adapted populations (ecotypes) have been identified across the geographical distribution of *E. vaginatum* using measures of biomass, physiology, and survival in reciprocal transplant experiments. The growing season is short in the arctic tundra, which raises the hypothesis that the phenology of arctic species may be non-adaptive if the timing and length of the growing season changes. Mature *E. vaginatum* tussocks from across a latitudinal gradient (65-70° N) were transplanted into a common garden at a central location (Toolik Lake, 68° 38' N, 149° 36' W), where half were warmed using open top chambers. Over two growing seasons (2015, 2016), leaf length was measured weekly to track growth rates, senescence timing, and biomass accumulation. Growth rates were similar across ecotypes and between years and were not affected by warming. However, southern populations accumulated significantly more biomass, largely because they started to senesce later. In 2016, peak biomass and senescence of most populations occurred later than in 2015. This was likely induced by colder weather at the beginning of the growing season, causing a delayed start to growth and therefore a delayed finish. Differences in phenology between populations were largely retained between years, suggesting that the amount of time that these ecotypes grow has been selected by the length of the growing seasons at their respective home sites. The timing of senescence was not affected by experimental warming over the peak season.

52. Determine *in-vivo* dielectric properties of breast tissues from ex-vivo measurement. A. Mancini, A. Sabouni.

In this presentation we will present a corrective coefficient between *in vivo* and *ex vivo* studies of three different tissue types to generate a comparative dielectric property database system for the use of microwave imaging. If we can determine a constant trend between the same tissue types, we should be able to generate a constant value that can be added to any dielectric reading taken *ex vivo* to match its *in vivo* counterpart. This technique will later help in aiding to create a quantitative image of patients who suffer from breast cancer.

53. Cubsat antenna for satellite communication. F. Alsabr, M. Alanazi, A. Sheikh, A. Sabban, A. Sabouni.

The presentation will give details about a design of a planar array helical antenna system that was submitted to the 2017 IEEE AP-S Students Design Contest. The goal is to design and build a cubesat antenna and *Deployment Procedures* for enabling high performance communications with a ground station. The antenna will be stewed inside a small cube before deployment that will then be launched into space.

54. Antenna Tattoo for epidermal electronic devices. Y. Almangour, A. Sabouni.

Flexible antennas have been studied for various applications including flexible electronics, wearable products, and biomedical devices. In this presentation, we will introduce a novel biocompatible flexible microstrip patch antenna that is designed to resonate at 2.4GHz and intended to work with Epidermal Electronic Systems (EES) for WLAN/ WiMAX applications. This antenna is flexible and will be applied to the human skin like a temporary tattoo.

55. Animal-mediated seed dispersal across an urban-rural gradient. D. Kriebel, G. Cadigan, S. Moreno, J. Stratford, M. Steele.

The effects of urbanization on species richness are well established, yet we understand very little of the consequence of urbanization on plant-animal interactions and related ecological processes. Oaks and their seed dispersers are an ideal system to study the effects of plant-animal interactions in anthropogenic-dominated landscapes. Our study investigated the caching and dispersal of pin oak *(Quercus palustris)* and red oak *(Q. rubra)* acorns by small mammals throughout rural, urban, and suburban sites in northeastern Pennsylvania. We presented 75 tagged acorns of both species in 27 different exclosures in 2015 and again at 25 exclosures at the same locations in 2016 that prevented access by other acorn consumers, such as deer, turkey, and blue jays, but allowed access by rodents (squirrels, chipmunks and field mice). In 2015, caching rate was significantly higher in suburban sites vs. rural and urban sites and significantly fewer acorns were eaten at suburban sites than the other two sites. We observed no significant difference in caching distance throughout the gradient. In 2016, we observed higher caching rates in urban and suburban sites vs. rural sites, and higher rates of seed predation at rural sites compared to the other two. We suggest that different assemblages of rodents as well as variation in the availability of alternative foods likely contributed to the outcome of these results.

56. Long-term patterns of weevil infestation in the fruits (acorns) of two oak species: *Quercus rubra* (red oaks) and *Q. alba* (white oaks). T. Pintsch, S. Marino, M. Suchocki, M. Steele.

Pre-dispersal, insect seed predation can significantly influence the reproductive success of many plant species. In oaks, for example, larvae of weevils (*Curculio* spp.) feed extensively on the cotyledon of acorns following immediate maturation of these fruits. Previous studies suggest weevil damage can in some cases result in nearly complete predation of an individual tree's acorn crop. However, most investigations on insect infestation are based on short-term studies. Here, we assessed weevil and insect prevalence and acorn damage in acorns of individual trees of two oak species (norther red oaks [*Q. rubra*] and white oaks [*Q. alba*]) over >25-years in northeastern Pennsylvania. In contrast to other studies we found that prevalence levels consistently ranged < 30% per individual trees of both species, only rarely exceeding this level in some individual trees. We also found that infestation was significantly higher in the basal end of acorns, often inflicting only partial damage to acorns. Based on these results and related studies from our laboratory, we suggest that these oaks may exhibit specific adaptations for tolerance and resistance to insect damage that allow oaks to successfully manage weevil and other insect infestation.

57. Comparing stability and kinetic properties of oxalate decarboxylase free in solution and tethered to the surface of magnetosomes. M. Roueinfar, A. VanWert, D. Lucent, W. Terzaghi.

Recent studies have found that tethering enzymes to surfaces can enhance their stability and also increase their activity and pH optima. In this study we have used synthetic biology techniques to construct a fusion protein tethering the enzyme oxalate decarboxylase to the surface of magnetosomes, a special kind of particle made by magnetotactic bacteria. We have made the construct, and are preparing to transfer it into *Magnetospirillum gryphiswaldense* by conjugation. We will then extract the recombinant magnetosomes and compare the properties of the attached oxalate decarboxylase with those of the free enzyme purified from E. coli. This work could lead to novel treatments for kidney stones, which are primarily crystals of calcium oxalate.

58. The culture of small businesses in NEPA. E. Lonstein, M. Clevenger

The poster will portray the types of culture from 8 NEPA counties to illuminate support for entrepreneurs.

59. Establishment of an evidence-based screening criteria for an inpatient clinical pharmacy service focused on transitions of care. D. Manning, J. Kristeller, C. Haupt, E. Stambone.

Developing evidence-based screening criteria allowed us to find, score, and prioritize patients to be cared for by a clinical pharmacy service. Score distribution analysis showed most patients had scores in the middle, but that there was a proportion of patients scoring either very high or very low. Given this information, we can establish guidelines for patient prioritization and when patients should be seen by a service with limited time and resources. Patients with the highest PRS along with the highest CPS score would benefit most from this service, as they are considered to be at highest risk for MRPs.

60. Evaluation of medication related problems and errors identified during pharmacist-led medication reconciliation. D. Manning, J. Kristeller, C. Haupt, H. Yanoski.

Pharmacist-led medication reconciliation is an essential step in developing an accurate medication list and completing a medication review. We have demonstrated that medication reconciliation completed by non-pharmacists results in errors. Furthermore, pharmacist involvement in this process leads to improved medication safety especially related to cardiovascular, analgesic, and pulmonary medications. It is unlikely that these MRPs would have been addressed without a pharmacist-led process. While most errors or MRPs did not cause harm, 23 contributed to temporary or permanent harm. These results suggest investment in pharmacist-led medication reconciliation can improve the quality and safety of patient care through better medication management.

61. Validation of an evidence-based screening process through correlation with medication-related problems detected during evaluation by a clinical pharmacy service. D. Manning, J. Kristeller, C. Haupt, E. McGrath.

This study showed that our evidence-based screening criteria did identify patients with the highest number of MRPs identified during evaluation. While our screening criteria utilized two separate scores to help identify the high-risk patient, it appears that the broader CPS system was better at identifying patients with potential MRPs. However, the PRS contains criteria that was specifically relevant to our institution's needs and therefore is a complementary data point to the CPS. Together, the positive correlation seen by comparing these two data points expresses that the screening criteria aids in selecting patients most likely to benefit from our clinical service.

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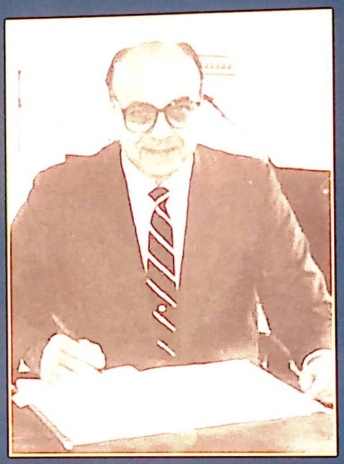

The Paul A. O'Hop Final Word Lecture was established by the the late Paul O'Hop to foster the exchange of ideas and dialogue among faculty, staff and administrators and to showcase the talents and scholarly abilities at Wilkes University. Mr. O'Hop retired from Wilkes in 2001 after serving 16 years as vice president of business affairs and auxiliary enterprises.

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