78th Annual Eastern Colleges Science Conference

NIAGARA UNIVERSITY

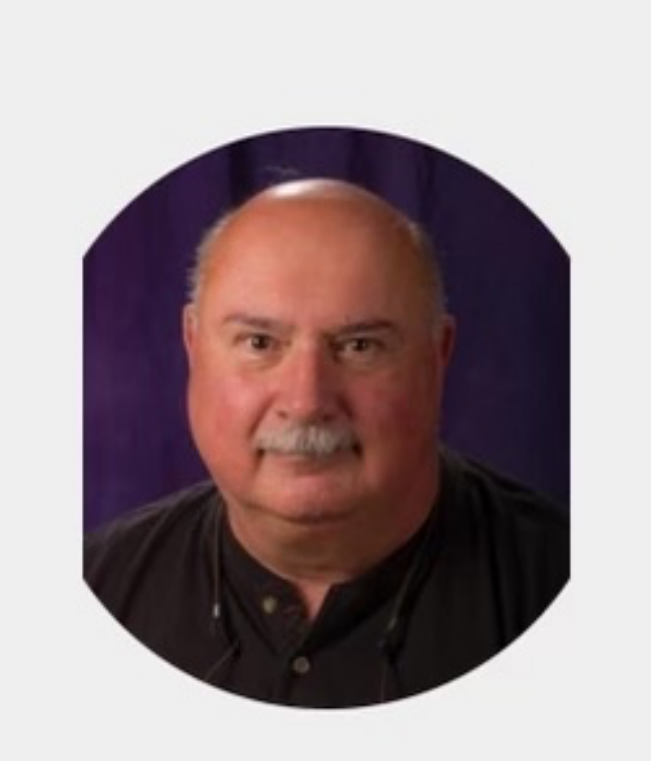
April 13, 2024

The 78th Annual Eastern Colleges Science Conference

April 2024

Program Book

In Memory of Robert S. Greene, Ph.D. (1951-2024)



Bob Greene was a professor of biology at Niagara University for 42 years, served as chair of the department for 29 years, and served on the board of the ECSC for 15 years. Sadly, he passed away earlier this year and will be sorely missed.

Welcome to ECSC 2024

Dear student researchers, mentors, and guests,

We enthusiastically welcome you to the 78th Eastern Colleges Science Conference (ECSC) at Niagara University. ECSC's tradition is to nurture the development of scientists-in-training and to provide an opportunity for critical engagement with the scientific community and inquisitive society members. Niagara University has hosted ECSC four times in the past, (1998, 2002, 2008,and 2015), and we are honored to host the ECSC again. Our goal is to provide an environment in which undergraduate students can present their research in a nurturing atmosphere that promotes personal and professional growth. We invite all our guests to network and collaborate in an open, friendly, respectful, inclusive, and constructive manner.

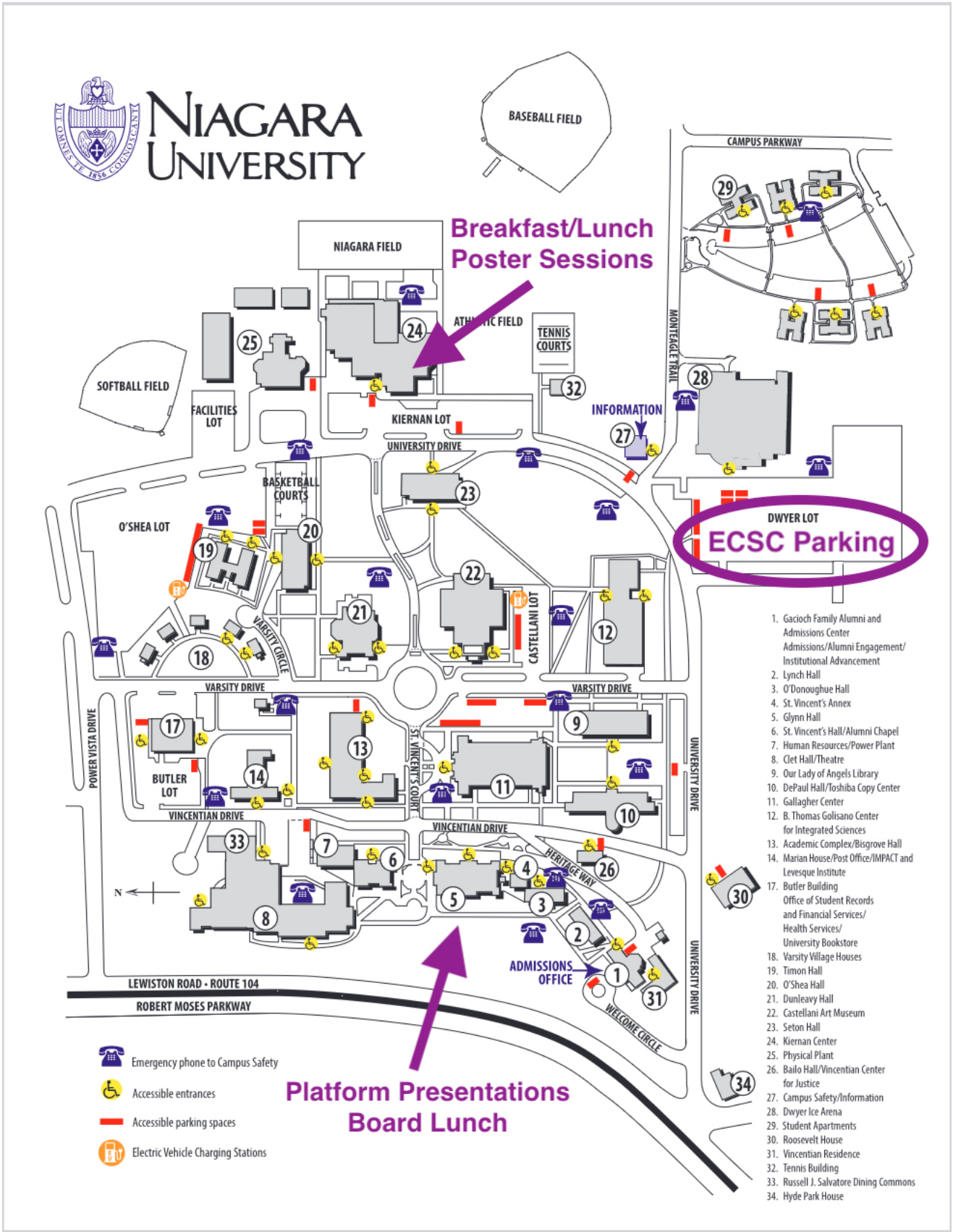
We look forward to celebrating with you the successes of our undergraduate students as they practice the art of communicating the backgrounds, methodologies, results, and conclusions of their research.

William J. Edwards, Ph.D., Chair of the Biology Department

Walt Steiner, Ph.D.
Organizer and Chair of the 2024 ECSC Planning Committee

J.T. Graham Solomons, Ph.D., Co-Chair of the 2024 ECSC Planning Committee

Sandra M. Ocampos, M.S.
Co-Chair of the 2024 ECSC Planning Committee


NIAGARA UNIVERSITY
BASEBALL FIELD
CAMPUS PARKWAY
Breakfast/Lunch
Poster Sessions
NIAGARA FIELD
ATHLETIC FIELD
TENNIS COURTS
SOFTBALL FIELD
FACILITIES LOT
KIERNAN LOT
UNIVERSITY DRIVE
MONTEAGLE TRAIL
INFORMATION
BASKETBALL COURTS
O'SHEA LOT
DWYER LOT
ECSC Parking
CASTELLANI LOT
VARSITY CIRCLE
VARSITY DRIVE
POWER VISTA DRIVE
BUTLER LOT
ST. VINCENTS COURT
VINCENTIAN DRIVE
HERITAGE WAY
ADMISSIONS OFFICE
WELCOME CIRCLE
LEWISTON ROAD - ROUTE 104
ROBERT MOSES PARKWAY
N
Emergency phone to Campus Safety
Accessible entrances
Accessible parking spaces
Electric Vehicle Charging Stations
Platform Presentations
Board Lunch
1. Gacioch Family Alumni and Admissions Center Admissions/Alumni Engagement/ Institutional Advancement
2. Lynch Hall
3. O'Donoughue Hall
4. St. Vincent's Annex
5. Glynn Hall
6. St. Vincent's Hall/Alumni Chapel
7. Human Resources/Power Plant
8. Clet Hall/Theatre
9. Our Lady of Angels Library
10. DePaul Hall/Toshiba Copy Center
11. Gallagher Center
12. B. Thomas Golisano Center for Integrated Sciences
13. Academic Complex/Bisgrove Hall
14. Marian House/Post Office/IMPACT and Levesque Institute
17. Butler Building Office of Student Records and Financial Services/ Health Services/ University Bookstore
18. Varsity Village Houses
19. Timon Hall
20. O'Shea Hall
21. Dunleavy Hall
22. Castellani Art Museum
23. Seton Hall
24. Kiernan Center
25. Physical Plant
26. Bailo Hall/Vincentian Center for Justice
27. Campus Safety/Information
28. Dwyer Ice Arena
29. Student Apartments
30. Roosevelt House
31. Vincentian Residence
32. Tennis Building
33. Russell J. Salvatore Dining Commons
34. Hyde Park House

Schedule of Events

Time	Event	Location
8:00-8:45 a.m.	Registration and Breakfast	Kiernan Center Lobby
8:45-9:15 a.m.	Orientation: Dr. Walt Steiner, Organizer Greetings: Rev. James Maher, C.M., President Dr. Timothy Ireland, Provost	Kiernan Center (Scaffidi Gym)
9:15-10:15 a.m.	Keynote Speaker: Arthur M. Michalek, PhD, FACE, FAACE Professor Emeritus/Dean Emeritus/SVP Emeritus Roswell Park Comprehensive Cancer Center Research Professor, Epidemiology & Environmental Health University at Buffalo "Reflections and Lessons Learned from a Life in Research"	Kiernan Center (Scaffidi Gym)
10:30-11:30 a.m.	Platform Session I A. Genetics I B. Ecology, Environmental Science C. Neuroscience, Immunology, & Molecular Biology D. Psychology, Behavior I	Glynn Hall (3rd floor) A. 305 B. 307 C. 309 D. 312
11:30-11:45 a.m.	Coffee Break	
11:45 a.m. - 12:45 p.m.	Platform Session II A. Microbiology/Environmental Science, Genetics II (Molecular Biology) B. Microbiology, Immunology C. Physics, Physiology D. Psychology, Zoology, Behavior II E. Psychology, Behavior III	Glynn Hall (3rd floor) A. 305 B. 307 C. 309 D. 312 E. 315
12:45-2:00 p.m.	Lunch	Kiernan Center, Scaffidi Gym
12:45-2:00 p.m.	Board meeting and Lunch	Glynn Hall, 405/406

Time	Event	Location
2:00-3:30 p.m.	Poster Session I (Odd Numbered) A. Computer Science (CS), CS/ Environmental Sciences, Education/CS, Economics B. Sociology, Anthropology, Psychology (PSY), PSY/ Behavior C. Neuroscience (NSC), NSC/ Toxicology D. Physics, Chemistry E. Biochemistry, Molecular Biology F. Genetics (GEN), Ecology/GEN	Kiernan Center, Front Gym
3:30-5:00 p.m.	Poster session II (Even Numbered) A. Environmental Sciences (ES), ES/Toxicology, ES/Botany B. Ecology, Ecology/ES, Ecology/Botany, Behavior C. Microbiology, Microbiology/ Molecular Biology, Microbiology/ES D. Physiology, Health Science	Kiernan Center, Front Gym
5:30-6:15 p.m.	Faculty Cocktail Hour	Double Tree Hotel, Cascade A
6:30 p.m.	Banquet & Awards Ceremony	Double Tree Hotel, River's Edge Ballroom

Judges' room for platform presentations: Glynn 311

Judges room for poster presentations: Kiernan Center 204

HISTORY OF THE EASTERN COLLEGES SCIENCE CONFERENCE

The first Eastern Colleges Science Conference (ECSC) was organized in 1947 by undergraduate Pauline Newman and Vassar College in Poughkeepsie, New York. The aim then, as now, was to stimulate interest in undergraduate research in the sciences and related fields and to provide a lively forum for the presentation of research papers. Pauline Newman received her bachelor's degree in chemistry and went on to receive a Ph.D. in chemistry from Yale. About 22 schools attended the first conference, and the theme was "Science, Philosophy and Society."

The constitution of the ECSC was ratified on April 24, 1948 at Union College in Schenectady NY, making the conference a self-sustaining body.

In 1972, the Pennsylvania State University was named the repository for all official documents of the ECSC. Professor Stanley Shepherd was named the permanent secretary of ECSC. In 1980 Professor Shepherd stepped down and Professor Gerard O'Leary from Providence College was elected to the post. At the 35th annual conference a steering committee was established to assist in directing the activities of the ECSC.

In 1983 the ECSC was incorporated in Rhode Island and now operates with a Board of Directors, elected from faculty of the participating colleges and universities. In 1986 Professor Gerard O'Leary stepped down, and Professor Edward Gabriel of Lycoming College was elected Chair of ECSC.

In 1995, Professor Lance S. Evans of Manhattan College was elected chair of the board. In 2007, Dr. Michael Kotarski of Niagara University was elected to Chair of the Board of Directors, and in 2011 was succeeded by Dr. Donald Stearns of Wagner University. In 2020, Lance S. Evans of the New York Botanical Garden was elected to Chair of the Board of Directors.

Interest has increased in the conference and over our 72-year history, 50 colleges and universities have attended this annual event. Over time the range of subject matter has also expanded and now covers computer science and behavioral and social sciences, as well as the original areas of biology, chemistry, mathematics, physics, and engineering.

EASTERN COLLEGES SCIENCE CONFERENCE MEETINGS

1947: Vassar College, Poughkeepsie, NY
1948: Union College, Schenectady, NY
1949: Adelphi College, Garden City, NY
1950: Bernard College, New York, NY
1951: Yale University, New Haven, CT
1952: PA college for Women, Pittsburgh, PA
1953: N.Y. State Col. for Teachers, Albany, NY
1954: Brooklyn College, Brooklyn, NY
1955: Seton Hall Univ., South Orange, NJ
1956: Temple University, Philadelphia, PA
1957: Georgetown Univ., Washington, DC
1958: Wilkes College, Wilkes-Barre, PA
1959: Suffolk University, Boston, MA
1960: Hunter College, New York, NY
1961: SUNY College of Forestry, Syracuse, NY
1962: NC State College, Raleigh, NC
1963: Boston College, Chestnut Hill, MA
1964: Jersey City State College, Jersey City, NJ
1965: Danbury State College, Danbury, CT
1966: D.C. Teacher's College, Washington, DC
1967: Fordham University, New York, NY
1968: Yale University, New Haven, CT
1969: Yale University, New Haven, CT
1970: Wilkes College, Wilkes-Barre, PA
1971: Rosary Hill College, Buffalo, NY
1972: U.S. Military Academy, West Point, NY
1973: Pennsylvania State Univ., Univ. Park, PA
1974: Worcester Polytech. Inst., Worcester, MA
1975: Widener College, Chester, PA
1976: Rhode Island College, Providence, RI
1977: Fairleigh Dickenson Univ., Rutherford, NJ
1978: Union College, Schenectady, NY
1979: Wilson College, Chambersburg, PA
1980: SUNY at Cortland, Cortland, NY
1981: Jersey City State College, Jersey City, NJ
1982: Lycoming College, Williamsport, PA
1983: Wilkes College, Wilkes-Barre, PA
1984: Providence College, Providence, RI
1985: SUNY and Fredonia, Fredonia, NY
1986: Duquesne University, Pittsburgh, PA
1987: Lycoming College, Williamsport, PA
1988: Ithaca College, Ithaca, NY
1989: U.S. Military Acad., West Point, NY
1990: Manhattan College, New York, NY
1991: SUNY at Fredonia, Fredonia, NY
1992: U.S. Naval Academy, Annapolis, MD
1993: Central CT State Univ., New Britain, CT
1994: Duquesne University, Pittsburgh, PA
1995: Ithaca College, Ithaca, NY
1996: Lycoming College, Williamsport, PA
1997: Central CT State Univ., New Britain, CT
1998: Niagara University, Lewiston, NY
1999: Sacred Heart University, Fairfield, CT
2000: Wagner College, Staten Island, NY
2001: Wilkes University, Wilkes-Barre, PA
2002: Niagara University, Lewiston, NY
2003: Ithaca College, Ithaca, NY
2004: Manhattan College, Bronx, NY
2005: Central CT State Univ., New Britain, CT
2006: St. Joseph's University, Philadelphia, PA
2007: College of Mount St. Vincent, Bronx, NY
2008: Niagara University, Lewiston, NY
2009: Wagner College, Staten Island, NY
2010: Pace University, Pleasantville, NY
2011: Sacred Heart University, Fairfield, CT
2012: William Paterson University, Wayne, NY
2013: Providence College, Providence, RI
2014: Marist College, Poughkeepsie, NY
2015: Niagara University, Lewiston, NY
2016: Western NE Univ., Springfield, MA
2017: Wilkes University, Wilkes-Barre, PA
2018: Ithaca College, Ithaca, NY
2019: Manhattan College, Bronx, NY
2020: Cancelled due to COVID-19
2021: Virtual
2022: Iona College, New Rochelle, NY
2023: Sacred Heart University, Fairfield, CT
2024: Niagara University, Lewiston, NY

ACKNOWLEDGEMENTS

First and foremost, the ECSC Planning Committee thanks Elizabeth Smith for her patience, support and thoughtful insights. We thank Mike Jeswald, Dan McMann, and Derek Puff for helping to organize this conference. We thank Fr. James Maher, Dr. Timothy Ireland, and Dr. Arthur Michalek for speaking at our conference. We thank our student volunteers and volunteer judges for donating their time. Lastly, we would like to thank Connie Greene, widow of Dr. Robert Greene, for her 30 years of service and dedication to Niagara University and the Biology and Chemistry departments.

GUEST SPEAKER FOR THE 2024 ECSC CONFERENCE

Arthur M. Michalek, Ph.D., has contributed substantially to the scientific community with approximately 200 publications in the areas of cancer, epidemiology, and education/training. He graduated with a Bachelor of Arts degree in biology from Canisius College (1975), a Master of Science degree in natural sciences from the University at Buffalo (UB, 1977), and a doctoral degree in experimental pathology-epidemiology (UB, 1980). Dr. Michalek has a long-standing commitment to training the next generation of scientists and clinicians, including high school, undergraduate, nursing, medical, doctoral, and postdoctoral cancer prevention/ psychology students. He is recognized for establishing public health programs at different academic institutes in the Western New York region that have been training the workforce for decades. This dates to his earliest appointments in 1983 to the Department of Educational Affairs at the Roswell Park Cancer Institute, where he joined as a cancer research scientist/ epidemiologist in the Department of Cancer Control and Epidemiology. Dr. Michalek also served as Director of the Division of Health Service Policy & Practice. At Roswell Park, Dr. Michalek's responsibilities included all aspects of training as well as research ethics. He was beloved by both colleagues and students and supported hundreds of mentees by anticipating their needs, challenging them to develop their skills, acknowledging and celebrating their accomplishments, and being ever-ready to provide assistance and guidance. His involvement with the UB School of Public Health and Health Professions even predates its existence. In the early 1990s, Dr. Michalek spearheaded the development of a clinical training site after he negotiated an affiliation with the University at Albany School of Public Health to establish a branch at UB. Many of his students have gone on to have highly successful careers and are active in research, medicine, and/or education. He culminated his appointment as Senior Vice President and Dean of the Roswell Park Graduate Division in 2010.

An active research passion has included cancer issues affecting marginalized communities, including American Indians. Dr. Michalek developed a long-standing and productive relationship with the Seneca Nation of Indians that involved a 30-year analysis of cancer incidence and cause-specific mortality. These data were used to help develop and prioritize programs within their health system. This commitment has extended to involvement on national committees within the National Cancer Institute, and appointments in national and international task forces that have advised on tribal breast and cancer cervical cancers. In Ukraine, Dr. Michalek coordinated the component of a three-country study that determined the risk of acute leukemia and the impacts of the 1986 Chernobyl nuclear power plant accident. He has served as an advisor/mentor in several international training programs in Oman, Sudan, Nigeria, and Egypt. Students in these countries have not only performed research, but advanced public health by learning how to develop cancer registries for surveillance purposes. Dr. Michalek has been a Fulbright Specialist in Poland, where he has taught at the Wroclaw Medical School, and Editor-in-Chief of the Journal of Cancer Education.

Upon his retirement, Dr. Michalek has stayed active in the community. He is currently treasurer and co-chair of the Grants Committee of the Patrick P. Lee Foundation, a WNY foundation that addresses two

areas - education and mental health. Dr. Michalek continues to be active in the academic community, leading public health training efforts. He led the Health Policy Doctoral Program at D'Youville University, where he developed a doctoral program in Health Services. Dr. Michalek currently assists at UB as a Research Professor in the Department of Epidemiology & Environmental Health. He sits on a board that sends students for international research projects, primarily in Africa, and collaborates with colleagues in Europe. In addition, Dr. Michalek is professor emeritus, dean emeritus, and senior vice president emeritus at the Roswell Park Graduate Division. The Eastern Colleges Science Conference planning committee thanks Dr. Michalek for his many contributions to building today's research and public health force.

MANUSCRIPTS SUBMITTED FOR EXCELLENCE AWARDS – 2024

Effects of high-sodium chloride diet on anxious behavior in rats.
Sarah Azzi and Marie Steinkuhl, Neuroscience Program, John Carroll University.

Antimicrobial Effects of Various Essential Oils.
Carpenter, S., Fahey, C., Figueroa, N., Johnson, A., & Bauer, S. PLS Dept., SUNY Alfred State College of Technology.

Effects of Prevagen on Spatial Working Memory in Rats.
Nathan Grubach and Isabel Wilson, Neuroscience Program, John Carroll University.

Machine Learning-Based Pipeline to Characterize a New Generation of the CaMPARI Sensor in Mice
Philopater Isak, Neuroscience Program, John Carroll University.

Investigating the Role of NF-kB Inhibition on Müller Glia Proliferation in a Chronic Disease State in the Zebrafish Retina.
Rebecca Mekhel, Neuroscience Program, John Carroll University.

Impaired Neurogenesis Following Simulated Microgravity.
John O'Connell and Barbara Murdoch, Department of Biology, Eastern Connecticut State University.

NF-κB Signaling Regulates the Proliferation of Müller Glia-Derived Progenitor Cells in Acute Damage of Zebrafish Retina.
Aidan Rodriguez, Neuroscience Program, John Carroll University.

Schedule of Platform Presentations

78th Annual ECSC

Name	Presentation No.	Glynn
Berman, Isaac	7	307
Chidester, Mary	2	305
Kohlroser, Christiana	12	309
Le, Anne	4	305
Lopez Garcia, Delcy	1	305
Mangioni, Bethany	6	307
Massaro, Ian	9	309
Matthews, Blake	19	315
Moone, Nathan	13	312
O'Bryan, Casey	3	305
O'Connell, John	10	309
Panora, Nathali	5	307
Savitski, Tyler	11	309
Shusterman, Ethan	15	312
Smart, Victoria	16	312
St. Clair, Julien	17	315
Walsh, Paige	8	307
Wheeler, Nicole	18	315
Win, Stella	14	312

Genetics, Microbiology, Environmental Science: Glynn 305

Time

10:30-11:30a *(genetics)*	**1-** GENE REGULATION BY THE ODD-1 TRANSCRIPTION FACTOR IN *C. ELEGANS.*	
	D. Lopez Garcia	Eastern Connecticut State University; Willimantic CT 06226
10:30-11:30a *(genetics)*	**2-** COMPUTATIONAL ANALYSIS OF THE EFFECTS OF GENE CLUSTERING ACROSS FUNCTIONALLY RELATED GENE FAMILIES IN THE BUDDING YEAST, *SACCHAROMYCES CEREVISIAE*	
	M. Chidester	Le Moyne College; Syracuse NY 13214
11:45a-12:45p *(microbiology, environmental science*)	**3-** TARGETED DNDC GENE KNOCKOUT IN *ACIDITHIOBACILLUS THIOOXIDANS*	
	C. O'Bryan	Niagara University; Lewiston NY 14109
11:45a-12:45p *(genetics)*	**4-** PHENOTYPIC CHARACTERIZATION AND ANALYSIS OF MUTATIONS SYMBIOTIC NITROGEN FIXATION MUTANTS IN THE MODEL LEGUME PLANT *MEDICAGO TRUNCATULA*	
	A. Le	Eastern Connecticut State University; Willimantic CT 06226

Microbiology/Immunology, Ecology and Environmental Science: Glynn 307

10:30-11:30a *(ecology)*	**5-** GENETIC AND VOCAL DIVERSITY IN BARRED OWLS AND SPOTTED *OWLS*	
	N. Panora	Ithaca College; Ithaca NY 14850
10:30-11:30a *(environmental science)*	**6-** COUPLED IRON REDUCTION AND AMMONIA OXIDATION WITHIN DEVIL'S BATHTUB, A FERRUGINOUS MEROMICTIC LAKE, IN ROCHESTER, NY	
	B. Mangioni	Niagara University; Lewiston NY 14109
11:45a-12:45p *(microbiology/ immunology)*	**7-** PREBIOTIC TREATMENT OF A DYSBIOTIC GUT INCREASES BACTERIAL LOAD OF MICE INFECTED WITH CHLAMYDIA	
	I. Berman	Ithaca College; Ithaca NY 14850
11:45a-12:45p *(microbiology)*	**8-** ISOLATION OF STAPHYLOCOCCAL PHAGE FROM WHITETAIL DEER	
	P. Walsh	Niagara University; Lewiston NY 14109

Neuroscience/ Immunology & Molecular Biology, Physics and Physiology: Glynn 309

10:30-11:30a *(neuroscience/ immunology)*	**9-** ELECTRON, LIGHT, AND CONFOCAL MICROSCOPY ANALYSES REVEAL MAST CELLS IN EXPLANTS OF THE ZEBRAFISH OPTIC TECTUM REDEVELOPING IN ORGANOTYPIC	
	I. Massaro	Wagner College; Staten Island NY 10301
10:30-11:30a *(neuroscience/ molecular biology*)	**10-** IMPAIRED NEUROGENESIS FOLLOWING SIMULATED MICROGRAVITY	
	J. O'Connell	Eastern Connecticut State University; Willimantic CT 06226
11:45a-12:45p *(physics)*	**11-** MOLECULAR DYNAMICS OF THE FLUOROUS EFFECT IN PROTEIN FOLDING	
	T. Savitski	Wilkes University; Wilkes-Barre PA 18766
11:45a-12:45p *(physiology)*	**12-** THE BALL IS IN YOUR CORT: THE EFFECT OF THERAPY DOG INTERACTIONS ON SALIVARY CORTISOL LEVELS OF HIGH SCHOOL STUDENTS	
	C. Kohlroser	Sacred Heart University; Fairfield CT 06825

Psychology, Behavior and Zoology: Glynn 312

10:30-11:30a *(psychology/ behavior)*	**13-** UNDERSTANDING ATTACHMENT STYLES: IMPACTS ON RELATIONSHIP USE AND PORN USE	
	N. Moone	Ithaca College; Ithaca NY 14850
10:30-11:30a *(psychology)*	**14-** TV GUIDE MAGAZINE: IDENTIFYING HARMFUL CONTENT	
	S. Win	Ithaca College; Ithaca NY 14850
11:45a-12:45p *(psychology/ behavior)*	**15-** UNDERSTANDING COMPULSIVE INTERNET USE AND GAMING THROUGH PERSONALITY	
	E. Shusterman	Ithaca College; Ithaca NY 14850
11:45a-12:45p *(behavior/ zoology)*	**16-** EFFECT OF PERSONALITY ON NATAL DISPERSAL IN PHODOPUS SUNGORUS	
	V. Smart	Ithaca College; Ithaca NY 14850

Psychology, Behavior: Glynn 315

10:30-11:30a *(psychology/ behavior)*

17- COPING DURING COVID-19: COMPARATIVE ANALYSIS BETWEEN REFUGEE AND NON-REFUGEE OLDER ADULTS

J. St. Clair — Sacred Heart University; Fairfield CT 06825

10:30-11:30a *(psychology/ behavior)*

18- TRAUMA AND FAMILY STRUCTURE: DUAL INFLUENCES ON NARCISSISM AND AGGRESSION

N. Wheeler — Ithaca College; Ithaca NY 14850

11:45a-12:45p *(psychology/ behavior)*

19- DEVELOPMENTAL PREDICTORS OF SUICIDAL IDEATION, SELF-INJURY AND SUBSTANCE USE

B. Matthews — Ithaca College; Ithaca NY 14850

Abstracts
Platform Presentations

1- GENE REGULATION BY THE ODD-1 TRANSCRIPTION FACTOR IN *C.ELEGANS*.
Lopez Garcia, Delcy
Eastern Connecticut State University

Mammals have two odd-skipped-related transcription factors, OSR1 and OSR2. These transcription factors are important for the development of numerous tissues, as well as various cancers. *C. elegans* has related *odd-skipped* transcription factors, *odd-1* and *odd-2.* Therefore*, C. elegans* is a good model organism to study human diseases like cancer. We are studying the up or downregulation of certain target genes by ODD-1. We are using a mutant strain (ACG4) that does not have a functional *odd-1* gene and comparing that to the wildtype (non-mutant) strain (N2). We have observed via quantitative RT-PCR that *odd-1* upregulates *dhs-3*, *ntl-2*, and *gly-5* (n =3) and *K0911.1* and *C24G6.61* (n =2). Results have also shown that *gpd-4, mex-6, prdx-3 C48B4.11,* and *lst-1* are downregulated by *odd-1*. Currently, we are doing a follow-up experiment on *dhs-3*, a gene that works in response to oxidative stress. If the gene is not expressed, cells start dividing uncontrollably, which can lead to cancer progression. We are using a fluorescent protein reporter to see where in the worm the protein is expressed. We are using a confocal microscope to determine whether the fluorescence of the gene changes when *odd-1* is mutated.

2- COMPUTATIONAL ANALYSIS OF THE EFFECTS OF GENE CLUSTERING ACROSS FUNCTIONALLY RELATED GENE FAMILIES IN THE BUDDING YEAST, *SACCHAROMYCES CEREVISIAE*
Chidester, Mary
Le Moyne College

Many functions of a cell rely on the expression of multiple related genes. In order to coordinate these functions, cells regulate the expression of their genes through various methods, including the organization of the genome. The budding yeast *Saccharomyces cerevisiae* is used to study gene regulation; notably, this model organism can demonstrate the effects of spatial positioning and distribution along the chromosomes. The distribution has been observed as functional groupings of genes whose products engage in secondary metabolite biosynthesis; metabolism and energy generation, such as the GAL genes; and genes whose products are required in stoichiometric quantities, such as ribosomal protein genes. Through clustering, *S. cerevisiae* can use shared promoters to regulate gene expression. We have characterized the prevalence and significance of the role that functional clustering of genes plays in coordinating the expression of large, coregulated gene families. Our research has analyzed the role of clustering in transcriptional regulation, particularly in the cell's response to environmental stress. Currently, we are working to expand our analysis to include the characterization of the significance of clustering through gene expression analysis.

3- TARGETED *DNDC* GENE KNOCKOUT IN *ACIDITHIOBACILLUS THIOOXIDANS*
O'Bryan, Casey
Niagara University

Acidithiobacillus thiooxidans is a sulfur-oxidizing, acidophilic, chemolithoautotroph that has an important role in the biohydrometallurgy process of bioleaching. This bacterium adds value to the mining industry by offering an environmentally friendly way to extract metals from low grade ores. We have isolated a strain of *A. thiooxidans* that encodes a set of genes known as the *dnd* operon. The operon is responsible for a process called phosphorothioate modification which replaces non-bridging oxygen atoms in the DNA backbone with sulfur atoms. We aim to determine the function

of the *dndC* gene in *A. thiooxidans* by generating a knockout strain. To do this, we have designed a CRISPR-Cas9 system that will generate a knockout of the gene through homology-directed repair. After a knockout is achieved, the knockout strain will be grown in varying environmental conditions including temperature, pH, and heavy metal concentrations. This will help us to determine if the *dnd* operon provides benefits to growth and survival in extreme conditions and ultimately if the *dnd* operon could add value to bacteria that are used in the process of bioleaching.

4- PHENOTYPIC CHARACTERIZATION AND ANALYSIS OF MUTATIONS SYMBIOTIC NITROGEN FIXATION MUTANTS IN THE MODEL LEGUME PLANT *MEDICAGO TRUNCATULA*

Le, Anne
Eastern Connecticut State University

Legume plants form symbiosis with the soil bacteria rhizobia and convert atmospheric nitrogen into biologically available ammonia by symbiotic nitrogen fixation (SNF). This is significant because agriculture depends on synthetic fertilizers as a major source of nitrogen. Synthetic fertilizer production is dependent on fossil fuels which is expensive and not sustainable. To discover novel genes that control SNF, I am characterizing four *Medicago truncatula* Tnt1 retrotransposon insertion mutants defective in SNF including NFxxx44, NFxxx18, NFxxx06 and NFxxx39. Wild-type (WT) and mutant plants were grown on aeroponic system in the absence of nitrogen and phenotypes were characterized. WT shoots are green with roots containing large ovoid pink nodules indicating efficient nitrogen fixation. All SNF mutant plants show reddish-purple shoots with roots showing small spherical white/light pink nodules indicating deficient nitrogen fixation. Root length, number of nodules and nodule ultrastructure were studied in WT and mutants. Tnt1 insertions in each mutant were identified using the *Medicago* Mutant Database and mapped to different chromosomes on the *Medicago* genome suing BLAST tool. Discovery of novel genes involved in SNF will help agriculture because farmers would use less artificial nitrogen fertilizers to grow essential non-legume crops such as wheat, rice, and corn.

5- GENETIC AND VOCAL DIVERSITY IN BARRED OWLS AND SPOTTED OWLS

Panora, Nathali
Ithaca College

Invasive species have been widely studied because of how they compete with native species. Spotted Owls (*Strix occidentalis*) inhabit west old growth forests mostly; however, due to deforestation, their habitat has been invaded by the Barred Owls (*Strix varia*) whose historically lived in the west of the USA. Barred Owls are larger in size and are very territorial which has driven Spotted Owls away from their habitat. The presence of Barred Owls has suppressed the calling behavior of Spotted Owls which is why their population continues to decline. There has also been evidence of hybridization between the Spotted and Barred Owls. The main objective of this paper is to evaluate the diversity in calls and genetics between these two species and their hybrids. To answer these questions, we obtained songs from both owl species including their hybrid and analyzed their frequency and amplitude using Raven Pro. We found that the Barred Owl calls residing in the west are very similar to Spotted Owl calls. The hybrid calls found and analyzed was very similar to Spotted Owl calls.

6- COUPLED IRON REDUCTION AND AMMONIA OXIDATION WITHIN DEVIL'S BATHTUB, A FERRUGINOUS MEROMICTIC LAKE, IN ROCHESTER, NY

Mangioni, Bethany
Niagara University

Meromictic lakes are permanently stratified with anoxic monimolimnia. Our study site, Devil's Bathtub (DBT) in Rochester, NY, is a ferruginous meromictic lake with high concentrations of iron and nitrogen compounds in the monimolimnion. In contrast to thermodynamic expectations, ammonia concentrations are lower than nitrite and nitrate. This suggests that ammonia oxidation

to nitrate or nitrite occurs via an unknown bacterial process. We hypothesize that iron-dependent ammonia oxidation is responsible for the observed geochemical profiles and meromixis, either through feammox, an energy metabolism coupling these reactions, or by separate taxa carrying out metabolisms separately. Due to anaerobic conditions, ammonia oxidation would require something besides oxygen as the terminal electron acceptor, which, based on the redox state and availability, could be Fe(III). Ferric iron regenerated at the surface and sinking to the bottom could fuel ammonia oxidation. To determine the responsible taxa, we extracted DNA from the water column for 16S rRNA gene sequencing. We found *Pirelullaceae*, known ammonia oxidizers, and *Geobacter*, known iron reducers. We will examine metagenomic data in search of marker genes of both metabolisms. This understudied redox pair may contribute to the biogenic meromixis of DBT and give us insight to the iron-nitrogen interactions in eutrophic conditions.

7- PREBIOTIC TREATMENT OF A DYSBIOTIC GUT INCREASES BACTERIAL LOAD OF MICE INFECTED WITH CHLAMYDIA

Berman, Isaac
Ithaca College

A healthy microbiome is composed of a diverse group of microorganisms. When diversity is disrupted, the microbiome goes into a state of dysbiosis. During dysbiosis the gut is highly susceptible to expansion of an opportunistic pathogen. *C. muridarum* is a mouse adapted opportunistic pathogen which infects mucosal barriers. We induced dysbiosis in mice with antibiotics and after we would then infect them with *C. muridarum*. We hypothesized that mice in dysbiosis would have an increased bacterial burden coupled with a less efficacious immune response. To counteract this, we hypothesized that a pre or probiotic treatment would recover diversity within the gut preventing pathogen expansion. This study shows that antibiotic induced dysbiosis does allow for greater pathogen expansion. Treatment with probiotics showed no significant change compared to mice given no recovery treatment. However prebiotic treated mice had a significant increase in pathogen burden correlated to a large increase in immune response. This provides insight into the dynamics the gut microbiome plays in preventing pathogen expansion and revealing prebiotic treatments may increase this risk of pathogen expansion while in dysbiosis.

8- ISOLATION OF STAPHYLOCOCCAL PHAGE FROM WHITETAIL DEER

Walsh, Paige
Niagara University

Staphylococcus aureus infections pose significant challenges to both human and animal health, with antibiotic resistance complicating treatment efforts. Bacteriophages have emerged as potential alternatives to antibiotics for controlling bacterial infections. In this study, we isolated and characterized a novel *Staphylococcus* bacteriophage from nasal swabs of whitetail deer (*Odocoileus virginianus*). The bacteriophage exhibited lytic activity against clinical isolates of methicillin-resistant Staphylococcus aureus (MRSA) strains, including those resistant to multiple antibiotics. The range of effectiveness of the phage against other bacteria was also determined.

9- ELECTRON, LIGHT, AND CONFOCAL MICROSCOPY ANALYSES REVEAL MAST CELLS IN EXPLANTS OF THE ZEBRAFISH OPTIC TECTUM REDEVELOPING IN ORGANOTYPIC CULTURE

Massaro, Ian
Wagner College

Zebrafish (*Danio rerio*) have been widely used as a model organism to study neurogenesis following traumatic brain injury (TBI) due to their unique regenerative capacities. Inflammation has been demonstrated to induce a regenerative response in the zebrafish brain however the necessary mechanisms required to onset inflammation remain underexplored. Mast cells have been documented to initiate inflammation and promote cell proliferation extracranially. Here, we investigate the potential presence of mast cells in explants of the zebrafish optic tectum via

electron, light, and confocal microscopy by labeling the mast cell specific marker carboxypeptidase-A5 (CPA5). Additionally, we investigate their function by co-labeling with proliferating cell nuclear antigen (PCNA) for active cell proliferation and vascular endothelial growth factor-A (VegfA) for neovascularization. Our study sheds light on the presence and potential role of mast cells in zebrafish neurogenesis following TBI. By investigating their localization and co-labeling with key markers, we contribute to a deeper understanding of the inflammatory response and cell proliferation mechanisms in the zebrafish brain. These findings may have implications for regenerative medicine and therapeutic approaches in TBI research.

10- IMPAIRED NEUROGENESIS FOLLOWING SIMULATED MICROGRAVITY
O'Connell, John
Eastern Connecticut State University

As NASA strives to advance the reach of human space exploration, astronauts are spending longer durations exposed to microgravity. Astronauts returning from space show cognitive deficits, like attention lapse and lower reaction times. With commercial spaceflight becoming more common and soon accessible to the public, understanding the mechanism of such deficits is imperative. How these changes occur in the brain is unknown, but one possibility is that microgravity causes the loss of brain cells. We studied whether microgravity exposure could cause the loss of neurons, the communication cells of the brain. We found that neural stem cells exposed to simulated microgravity produced less neurons compared to control, and the neurons that were produced had altered morphology. To investigate the underlying mechanism of these changes, we performed quantitative polymerase chain reaction (qPCR) to test for changes in gene expression of proteins known to drive neurogenesis (HES1, MASH1, NEUROD1, and NEUROG1) and found many to be reduced under microgravity compared to control. Reinstatement of these proneural transcription factors to their normal expression levels may overturn the decline in neuron production and reverse cognitive impairment after space flight.

11- MOLECULAR DYNAMICS OF THE FLUOROUS EFFECT IN PROTEIN FOLDING
Savitski, Tyler
Wilkes University

The fluorous effect, the peculiar solubility observed in compounds with carbon-fluorine bonds, has been used in chemical engineering for some time, but has only recently been investigated in the context of biological systems. By substituting fluorinated versions of standard amino acids, the fluorous effect can be incorporated into proteins, enabling its use as both a probe of protein dynamics and as a means for tuning the stability of engineered biomolecules. In this work, we aim to understand the kinetics and thermodynamics of fluorinated proteins as they fold. For this we use molecular dynamics simulations of fluorinated variants of the mini-protein NTL9. The results of these simulations provide a detailed model of the folding of this protein which can then be readily compared to biochemical experiments. We also simulate several model systems of hydrocarbon and fluorocarbon surfaces, exploring the behavior and thermodynamic properties of solvent in the presence of the fluorous effect and hydrophobic effect, both in the context of each other as well as standalone phenomena.

12- THE BALL IS IN YOUR CORT: THE EFFECT OF THERAPY DOG INTERACTIONS ON SALIVARY CORTISOL LEVELS OF HIGH SCHOOL STUDENTS
Kohlroser, Christiana
Sacred Heart University

High schools are increasingly using therapy dogs with the aim of reducing student stress levels. The high levels of stress perceived by students negatively impacts their academic performance. Despite the increasing introduction of therapy dogs, few studies have examined the physiological response of students. Cortisol levels are used as a measure of stress in humans. Our study measured salivary cortisol levels of students before and after interaction with therapy dogs. This interaction was expected to decrease their cortisol levels. Saliva samples of participants were

collected using Salimetrics Salivabio Oral Swab (SOS) method. Participants were swabbed 15 minutes after arrival to the study (baseline) and 15 minutes after a 10-minute interaction with a therapy dog (treatment). These samples were processed for cortisol concentration using Salimetrics High Sensitivity Salivary Cortisol ELISA kit. To compare concentration differences before and after the interaction, a four-parameter logistic curve linear regression in MyAssays software was used. Preliminary results show on average, student cortisol levels significantly decreased after interaction with a therapy dog ($t = 4.47$; $p < 0.001$). These findings suggest that the use of therapy dogs may alleviate some of the stress perceived by high school students and subsequently increase their overall academic performance.

13- UNDERSTANDING ATTACHMENT STYLES: IMPACTS ON RELATIONSHIP USE AND PORN USE

Moone, Nathan
Ithaca College

Attachment styles have been of scientific interest because of their potential to influence aspects of romantic relationships (Mohd et. al., 2023). Noppaprach et. al., (2015) found that insecure attachment styles, characterized by anxiety and avoidance, were significant influences of romantic relationship satisfaction. Hasim et. al., (2011) also explored the relationship between attachment styles and relationship satisfaction, finding that securely attached individuals were most satisfied in their relationships. Attachment is also related to pornography use. Maas et. al., (2015) found anxiously attached men who accessed pornography more had higher relationship satisfaction, but the pattern was opposite for women. The current study employed a sample of 865 participants enrolled at a northeastern liberal arts college. Results demonstrated low discomfort with closeness and higher confidence were strong predictors of relationship satisfaction. Discomfort with closeness was a better predictor of low relationship satisfaction for women and need for approval was more of a predictor for men. Confidence predicted relationship satisfaction for both men and women, but more strongly for men. Pornography use was related to discomfort with closeness. The limitations of this study are discussed in suggestions for future research offered.

14- TV GUIDE MAGAZINE: IDENTIFYING HARMFUL CONTENT

Win, Stella
Ithaca College

While there has been a great deal of research on the nature of advertising on television (e.g., Dale et al., 2013), there have been few content analyses regarding harmful content presented in magazine advertisements; even for very popular magazines like TV Guide. This study analyzed a large sample of issues of TV Guide over a 45-year period, focused on identifying the product type, target audience, warning labels, and other content. Ads were categorized as having harmful content when they deceived the reader or featured products that had the potential to cause harm or disadvantage to the user (e.g., cigarettes, cigars, alcoholic beverages, misleading drug and diet products, psychics, loans, pay-by-time phone call services). The sample consisted of issues from 16 different years at 3-year intervals from 1974-2019, analyzing 8 issues per year (2 from each season). The content was analyzed by pairs of trained coders. The resulting sample of more than 2700 advertisements included a large number that were identified as having content, especially in early decades (1970s-1990s). Cigarette ads were the most frequent harmful ads, and while they did contain warnings, those warning messages were typically very small. The analysis also considered the target audience (men vs. women) for different harmful product types.

15- UNDERSTANDING COMPULSIVE INTERNET USE AND GAMING THROUGH PERSONALITY

Shusterman, Ethan
Ithaca College

Over the last two decades, the internet, including video games, has become an integral part of day-to-day life. There is concern about problematic use especially by teenagers and adolescents. Current research on the role of personality traits in Compulsive Internet Use (CIU) and gaming

behavior shows that specific personality traits may confer vulnerability (Kayiş et al., 2016). Our study included 655 participants from a Northeastern college. Participants completed the Compulsive Internet Use scale and Big 5 Inventory, and responded to questions regarding gaming. This study was reviewed and approved by the Institutional Review Board. Results demonstrated multiple significant relationships between personality traits and CIU, including conscientiousness, agreeableness and neuroticism. These results replicate some existing literature, though agreement is not uniform. Our study of gaming behavior also demonstrated negative relationships with conscientiousness and agreeableness. Additional variables, including gender, were explored. Limitations and suggestions for future research are offered.

16- EFFECT OF PERSONALITY ON NATAL DISPERSAL IN *PHODOPUS SUNGORUS*
Smart, Victoria
Ithaca College

Personality has been identified as a pattern of consistent differences in behavior amongst individuals. Many personality traits have been discovered in animals such as boldness, exploration, and aggression. These traits can affect an individual's natal dispersal, which is defined as an individual leaving the home range it was born in. We are investigating the effect of personality on natal dispersal in a colony of captive Siberian dwarf hamsters (*Phodopus sungorus*). Prior experiments in the lab with a simple maze assay have provided evidence that activity and boldness are repeatable traits in dwarf hamsters. To measure movements out of the nest, we microchipped a mother and pups. The breeding cage is attached to a large maze equipped with chip readers that provide over 23m of linear distance separating four additional housing spaces. The hamster pups will be tested post-weaning and as adults in the standard assay to score their boldness and activity. We predict that the hamsters with lower boldness scores will be prone to shorter traveling distances and will frequently return to their original nest. We also predict that hamsters with higher activity scores will move through the maze more and earlier than their counterparts.

17- COPING DURING COVID-19: COMPARATIVE ANALYSIS BETWEEN REFUGEE AND NON-REFUGEE OLDER ADULTS
St. Clair, Julien
Sacred Heart University

As the ramifications of the COVID-19 pandemic are still being discussed, the implications of COVID-19 among aging populations must be documented, especially underrepresented aging adults such as refugees. The overall well-being of older adults may have been impacted due to the novelty of challenges posed by the pandemic. As such, the present study examines the implications of COVID-19 among older refugee and non-refugee populations in the U.S. Interviews were conducted among older adults aged 55-69 (m=66.3), living in the Northeast of the U.S. A total of 81 interviews were conducted (35 refugees and 46 non-refugees). The participants were asked a series of questions about their life before, during, and after COVID-19. Thematic content analysis was used to analyze the data. Emergent themes showed that although older refugees and non-refugees experienced similar challenges, they seemed salient for aging refugee populations due to their background and experiences. Results showed that both populations adopted similar coping mechanisms such as social support. In contrast, refugees used traditional/herbal medicine and engaged in cognitive framing, whereas non-refugees coped by having a positive mindset and embracing new technology. Understanding the implications of COVID-19 among older adults is essential to developing tailored interventions.

18- TRAUMA AND FAMILY STRUCTURE: DUAL INFLUENCES ON NARCISSISM AND AGGRESSION
Wheeler, Nicole
Ithaca College

Research has demonstrated reliable associations between trauma, narcissism, and aggression. Findings suggest positive associations between childhood trauma with both narcissism and aggression (Keene & Epps, 2016). Previous research also suggests relationships between narcissism and aggression with family structure (Lan, X., 2021; Ram, B. et al., 2005). The current study explores the relationship between childhood trauma and family structure with both aggression and narcissism. A sample of 655 students at a northeastern liberal arts college completed an online study, including the Buss-Perry Aggression and Grandiose Narcissism Scales (GNS), Childhood Trauma Questionnaire (CTQ), Adverse Childhood Experiences (ACE), and questions about family structure. Results demonstrated a significant positive relationship between CTQ scores and GNS scores ($r(558) = .08$, $p < .05$), and between CTQ scores and aggression scores ($r(578) = .44$, $p < .001$). A significant relationship between ACE and aggression ($r(578) = .29$, $p < .001$) was also observed. There were no significant differences in narcissism between children of married versus divorced parents. However, there was a significant positive relationship between number of siblings and aggression ($r(96) = .35$, $p < .001$), as well as a significant relationship between only child status and aggression. The limitations and implications of these findings are discussed.

19- DEVELOPMENTAL PREDICTORS OF SUICIDAL IDEATION, SELF-INJURY AND SUBSTANCE USE

Matthews, Blake
Ithaca College

A large body of research shows Childhood Trauma to be a risk factor for developing thoughts of suicide for young adults(Rogerson et al., 2023; Wong et al., 2023). The present study explores correlations between Childhood Trauma and non-suicidal Self-Harm behavior, Suicidal Ideation and Drug Usage. Results in this study were achieved by having participants respond to the Childhood Trauma Questionnaire (CTQ) as well as questions about their own personal behaviors, including items about Drug Usage, Self-Harm, and Suicidal Ideation. Results from the present study demonstrated that Total CTQ scores were significantly positively correlated with non-suicidal Self-Harm behaviors ($r(581) = .22$, $p < .001$), all CTQ subscales were also correlated with non-suicidal Self-Harm behaviors. Also, total CTQ scores were significantly positively correlated with Suicidal Ideation ($r(581) = .35$, $p < .001$) and all CTQ subscales. Alcohol use was not correlated with CTQ Total scores, whereas Marijuana ($r(581) = .18$, $p < .001$), Cocaine ($r(581) = .09$, $p = .034$), and Painkiller use ($r(581) = .14$, $p < .001$) was. Limitations of the CTQ, and the role of class, race, and gender in the study are discussed.

Schedule of Poster Sessions

78th Annual ECSC

Name	Poster No.	Poster Session
Abdulky, Katya; Marcum, Matty	58	II
Arpaio, Ralph	53	I
Bednarz, Kathryn et. al.	63	I
Besnilian, Alexander; Cullinan, Kevin	85	I
Campolo, Joseph A.; Farzin, Hanna	65	I
Capin, Justin; Patel, Diya	28	II
Cruz, Maraya; Saldana, Catherine	56	II
Cusick, Robert	64	II
DeJordy, Kaitlyn	36	II
Dotto, Michael; Newbauer, Vanessa	81	I
Egger, Abigale	89	I
Edwards, Ciaran et. al.	42	II
Faeth, Samantha; Mullane, Julia	43	I
Fahey, Calla	68	II
Flores, Junanyelis	41	I
Garraway, Wynnade	76	II
Goruk, Taras	51	I
Greybosh, David; Gubbiotti, Joseph	57	I
Grubach, Nathan; Wilson, Isabel	47	I
Guido, Gianna	30	II
Hartmann, Kaitlyn	39	I
Hildreth, Morgan et. al.	61	I
Isak, Philopater	45	I
Jacobson, Paul; Moore, James	50	II
Jordan, La'Tysiah; Tong, Yonghong	35	I
Kiedrowski, Alexandra	26	II
Kleiner, Corinne; Stoj, Christopher S.	67	I
LaVergne, Timothy	77	I
Lewis, Amanda; Gonzalez, Angelina	33	I
Lindner, Liam	37	I
LoBasso, Gianna	32	II
Malynych, Yaroslav et. al.	71	I
Mancini, Alyssa; Lerner, Kyra	52	II
Martes, Nate et. al.	29	I
Mattson, Grace	20	II
McGann, Keith	38	II
McManus, Mary; Pereira, Jillian	44	II

Mekhel, Rebecca	80	II
Menon, Dante; Glazier, Virginia E.	70	II
Merlino, James	49	I
Minix, Mary	23	I
Newbauer, Vanessa; Dotto, Mike	83	I
Pace, Isabella; Tenedine, Joseph	55	I
Pham, Anh	21	I
Poplavskyi, Maksym et. al.	69	I
Quach, Minh	25	I
Rabadi, Angelina	54	II
Ribaudo, Charlotte; Scheibl, Emma	46	II
Rodriguez, Aidan	73	I
Root, Mary	62	II
Shaan, Ishfar et. al.	75	I
Shak, Yen Yi	79	I
Simonin, Emily	48	I
Steinkuhl, Marie; Azzi, Sarah	78	II
Sulca, Adriana	22	II
Sweeney, Grace et. al.	66	II
Tischendorf, Ava; Wagner, Haley	72	II
Tsaglos, Mason et. al.	34	II
Tucci, Mikayla; Cote, Lauren	87	I
Van Lieshout, Clare; Edwards, William J.	24	II
Villarreal, Mateo et. al.	31	I
Waldmiller, Sarah	59	I
Werner, Ciara et. al.	74	II
Willis, Avia	60	II
Wrobel, Samantha et. al.	40	II

Poster Session I.

A. Computer Science (CS), CS/Environmental Sciences, Education/CS, Economics

21- Visualizing the Stock Showdown: Comparative Analysis and Predictive Modeling of Apple and Microsoft Markets using Python Programming Language

Pham, Anh; Tong, Yonghong
Niagara University; Lewiston NY 14109

This study utilizes Python programming language to conduct a comparative analysis and predictive modeling of Apple and Microsoft stock markets. The data is obtained from Yahoo Finance and spans the last ten years, from January 1, 2014, to December 29, 2023. Through the utilization of this data, visualizations in the form of line charts are created to depict the fluctuations within the Apple and Microsoft stock markets. These visualizations serve as a foundation for comparative assessments, enabling insights into the performance of these two stocks over the specified timeframe. Additionally, predictive modeling techniques are applied to forecast potential future trends in the stock markets of Apple and Microsoft. This study not only provides valuable insights into the dynamics of these two well-known stocks but also demonstrates the efficiency of Python programming language in conducting comprehensive analyses and making informed predictions in financial markets.

23- Comprehensive Assessment of Paratransit Accessibility Across the United States Using GIS

Minix, Mary; Tong, Yonghong
Niagara University; Lewiston NY 14109

Paratransit is transportation that is accessible to people with disabilities. It involves a range of services, including accessible buses, trains, stations, and on-demand vans. Agencies, depending on their needs and limitations, can offer paratransit adapted to their requirements. This study employs Geographic Information Systems (GIS) to analyze the variability of paratransit services across the United States, considering factors such as fuel type, service area, population served, and user demographics. The data used in this study is from the National Transit Database, which encompasses information from over 800 public transportation agencies receiving grants from the Federal Transit Administration. This study aims to identify similarities among agencies to inform improvements and enhance the understanding of paratransit demand and availability. In addition, the informative maps could empower paratransit users by facilitating easy access to service locations, there by addressing the fragmented nature of service provision across agencies and states. This study endeavors to streamline the process of finding suitable accessible transportation options for travelers with disabilities by compiling the information into formatted maps. Formatted maps aim to serve as effective tools for communication and advocacy, contributing to the goal of improving paratransit accessibility and inclusivity nationwide.

25- The Effect of Dividend Payments on Companies' Investments: An Analysis of Investment Cash Flow Sensitivity Using Python

Quach, Minh; Tong, Yonghong
Niagara University; Lewiston NY 14109

Over-investment is a phenomenon where companies invest not only in potential projects but also in projects with negative net present values (NPVs) to provide managers with more power and reputation because the management team is often rewarded based on the speed of sales growth. This behavior may result in inefficient investment decisions, causing losses to the company value. On the other hand, Investment-Cash Flow Sensitivity shows that as a company's internal cash flow rises, so does its investment level, influenced by theories like agency issues and asymmetric information. Therefore, dividend payments can mitigate over-investment by reducing internal cash flow. The paper collected data from financial statements of listed companies on HOSE and HNX, which are two major, high liquidity, widely published information stock exchanges in Vietnam. The research concentrated on listed companies during the period 2011-2021. Data

processing, estimation, and model testing will be performed by the writer using Python. The results will support the shareholders' decision to try to claim higher dividends payout not only to compensate for their invested money but also to deal with principal-agent issues and over-investment.

27- Withdrawn

29- Exploring Methodological Diversity in Faculty Scholarship: A Likert Scale Analysis Across Disciplines

Martes, Nate; Paresa, Kamea; Wolfgang, Will
Wilkes University; Wilkes-Barre PA18766

This study investigates methodological diversity in faculty scholarship across disciplines using a Likert scale assessment based on Kapolka et al.'s model. Our analysis encompasses twelve-dimension axes grouped as six areas: Epistemological Nature, Observational Context, Scope and Structure, Modes and Representations, Approaches to Learning, and Interaction and Engagement. Hypotheses propose correlations between the Quantitative/Qualitative and Empirical/Theoretical axes; the Deductive/Inductive and Ideographic/Nomothetic axes; as well as a positive relationship between overall methodological diversity and innovation of methods ratings within disciplines. Our findings offer insights into the methodological landscape of academia, facilitate interdisciplinary dialogue and foster a deeper understanding of research practices across fields.

B. Sociology, Anthropology, Psychology (PSY), PSY/Behavior

31- How Older Men and Women Varied in Coping During COVID-19 Pandemic

Villarreal, Mateo; St. Clair, Julien; Longobardo, Kathleen; Purcell, Mia
Sacred Heart University; Fairfield CT 06825

Due to the novelty experience posed by COVID-19, understanding how older adults coped is important and more so, if their coping strategies varied by sex. Research studies show that older adults differ in terms of comorbidity, with women mostly affected. Since COVID-19 poses unique challenges such as social distancing and quarantine, the present study seeks to understand COVID-19 coping related strategies among older adults, and variations in coping by sex. The present study recruited 68 older adults (39 females and 29 males), aged 55-69 (m=65.7 years) from the East Coast region of the United States to participate in interviews on their perceptions of life during COVID-19. Thematic content analysis was used to analyze the data. Emergent themes showed that men and women used similar coping strategies e.g., having a positive mindset and embracing new technology. Variation in coping emerged when participants discussed social support as a way of coping. For female participants, social support seemed to provide emotional support in coping, whereas male participants used social networks to mainly seek information and stay up to date with COVID-19 related issues. By understanding COVID-19 implications societies can implement modes of service delivery to better meet the health needs of the population.

33- Fact to Fluff: A Content Analysis of TV Guide Magazine Articles (1970s-2010s)

Lewis, Amanda; Gonzalez, Angelina
Ithaca College; Ithaca NY 14850

While there have been many content analyses of popular magazines, few have explored the content of TV Guide, which was the leading magazine in the U.S. for many decades. This study describes the evolution of TV Guide magazine content from 1974-2019, including the covers and the articles in 128 issues. Employing a comprehensive approach where each issue was analyzed by a pair of trained coders, the study examined historical changes in article length and type of story (e.g., politics, celebrity profiles, entertainment, sports, diversity, technology), as well as portrayals in images by gender. The articles got shorter over time, and the topics covered moved from serious issues in the 1970s and 1980s (e.g., media regulation, politics, impact on children) to almost exclusively focusing on celebrity interviews, spotlights,

and other “fluff.” Women were more likely to be shown in revealing clothing and sexualized poses than men, in both the articles and the covers. Results are discussed in terms of their impact on readers, and the causal factors behind the observed changes over time.

35- Investigating the Influence of Household Environmental Factors on Mental Health Using GIS

Jordan, La'Tysiah; Tong, Yonghong
Niagara University; Lewiston NY 14109

This study utilizes Geographic Information Systems (GIS) analysis to explore the influence of household environmental factors, such as physical and emotional abuse, divorce and parental separation, and household substance use on mental health and trauma. The data used in this study is Adverse Childhood Experiences (ACE) Data which is collected from the Centers for Disease Control and Prevention (CDC) behavioral risk factor surveillance system, which is from all the states across the United States. By using GIS techniques, the research aims to explore spatial patterns and relationships between household environmental factors and various aspects of well-being, including physical, mental, and emotional health. Through GIS techniques, the study will explore distribution of ACE factors nationwide and identify the predominant factors that contribute to mental health and trauma. In addition, an analysis will identify the correlation between household environment factors and mental instability. Insights gained from this study will provide valuable understanding of how household environmental factors impact overall well-being, offering insights for policymakers, and healthcare professionals to develop targeted strategies aimed at promoting overall wellness and lessening the effects of trauma.

37- Ads: Then and Now (TV Guide Edition)

Lindner, Liam
Ithaca College; Ithaca, NY 14850

There have been many studies on advertising content in magazines, in the U.S. and other countries (e.g., Nelson & Paek, 2007). However, no studies have looked at TV Guide magazine, the leading U.S. magazine for decades, appealing to teen and adult readers. In this study, trained pairs of coders analyzed advertisements in 128 issues of TV Guide magazine over a 45-year period (1974-2019), coding two issues from each season every three years. Each advertisement was analyzed for product type, size, placement in the magazine, color vs. black & white, and target audience. More than 2700 ads were analyzed for variations by year and season. The number of ads in each issue declined significantly over time, partly as a reflection of changes in size and format of the magazine in 2007. There were 44 different product types represented in the ads, the most common being ads for cigarettes (especially in the 1970s - 1990s) and home furnishings. Cigarette ads – which are not all owed to be aired on television – were most likely to appear in color and in the most exclusive locations (e.g., back cover). Other analyses included target audience by product and year.

39- Fins and Feminism: Assessing Gender Equality in Discovery’s 'Shark Week'

Hartmann, Kaitlyn
Sacred Heart University; Fairfield CT 06825

Discovery Channel's "Shark Week" is a well-known yearly television special that captivates viewers with its investigation of shark behavior, biology, and conservation initiatives. Still, it raises crucial questions about gender representation in its stories. Despite the presence of equally qualified and knowledgeable female-presenting scientists and researchers in the field of shark science, a study by Whitenack and colleagues showed that only 26% of episodes from 1988-2020 featured women as experts. Our study begins to assess differences in how men and women are portrayed in "Shark Week" episodes by examining screen time allocation, the number of named women, and whether or not the women are identified as scientists or experts. Preliminary results suggest that the visibility of women on screen is much lower than their male counterparts, the number of named women is significantly lower than that of males, and of the named women even fewer are identified as scientists or experts. This highlights gender disparities in science-related media representations. Equal representation is important to promoting gender equality, challenging

stereotypes, and providing diverse role models. Ultimately, fostering accurate perceptions of women's expertise and contributions in scientific endeavors is vital for cultivating inclusive environments and inspiring future generations of scientists and researchers.

41- Native and Medicinal Plant Knowledge Across Diverse Groups in Jersey City, New Jersey

Flores, Junanyelis
Saint Peter's University; Jersey City, NJ 07306

The city of Jersey City, located in the New York Metropolitan area, is home to the most diverse population in the United States. This rich diversity represents cultures from across the globe that bring to the city a variety of unique cultural and biological knowledge of their former regions. This study proposed that the longer an individual lives away from their native culture, the more knowledge they lose of the medicinal and native plants from their home country. Research teams went out into different neighborhoods where people shopped for food and conducted surveys to determine the amount of knowledge a participant had about plants from their family's home country. The results indicated that knowledge was indeed lost but that it was more complicated than simply time away from their native culture and varied across different cultural groups.

C. Neuroscience (NSC), NSC/ Toxicology

43- Neurotoxicity of 2,2',4,4'-tetrabromodiphenyl ether (BDE-47) during embryonic zebrafish development

Faeth, Samantha; Mullane, Julia
Sacred Heart University; Fairfield CT 06825

Polybrominated diphenyl ethers (PBDEs) are added in high volumes to textiles, furniture foams, plastics and electronics as flame retardants. Although these PBDEs are effective in protecting property and human life from fire, their high production volumes have led PBDEs to be pervasive environmental contaminants and pose an ecological risk. Here we investigate the developmental neurotoxicity of 2,2',4,4'-tetrabromodiphenyl ether (PBDE-47) using the zebrafish vertebrate model system. We treated zebrafish embryos with control, vehicle, low (5μM) and high concentration (20μM) of PBDE-47 at 6 hours post-fertilization before the onset of gastrulation and treated continuously until 6 days. Consistent with others, we find abnormal curvature of the body with flexion of the hindbrain, but studies on neurotoxicity were lacking. Using a transgenic expressing green fluorescent protein in the branchiomotor neurons of the hindbrain, we find a significant decrease in the length of rhombomere 1-8 and loss of the canonical patterning of branchiomotor neurons V-VII in treated embryos. We further investigated oligodendrocytes in the hindbrain using a myelin basic protein transgenic and found a significant decrease in the number of oligodendrocytes in the hindbrain of treated embryos. Given the abnormal curvature of the body, we also investigated primary motor neurons which innervate the trunk musculature. Others have noted early inhibition of axonal growth in primary motoneurons. We find that by 6 days despite the spinal curvature, the pattern along the chevron-shaped somites was not affected, however PBDE-47 treated embryos demonstrated a decrease in motoneuron signal. Here we conclude that PBDE-47 is neurotoxic to the developing embryos.

45- Machine Learning-Based Pipeline to Characterize a New Generation of the CaMPARI Sensor in Mice

Isak, Philopater
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Recording large-scale neuronal activity patterns in rodents poses a significant challenge with current microscopy techniques. This study aimed to achieve cortex-wide monitoring of brain activity with cellular precision using the calcium sensor, CaMPARI. CaMPARI functions as a fluorescent sensor that binds to calcium ions (Ca^{2+}), indicating neuronal activity through two mechanisms: an immediate decrease in fluorescence upon calcium binding and photoconversion (PC) from green to red fluorescence when

exposed to violet light while bound to Ca^{2+}. To enhance the performance of CaMPARI, novel sensor variants with modified protein structures were generated and evaluated in vivo to assess their specificity and sensitivity. Imaging of the primary visual (V1) and somatosensory (S1) cortices was conducted during visual stimulation in mice, revealing increased photoconversion in V1 indicative of neuronal activity. A machine-learned model was developed to automate cell detection in recorded fields of view, significantly reducing processing time. Analysis of photoconversion levels in V1 and S1 cortical areas across multiple variants highlighted the heightened photoconversion in V1 of variant 9, suggesting potential specificity for active neurons. Notably, variant 9 also displayed increased responsiveness to visual stimuli. These findings underscore the importance of further investigating variant 9 and developing subsequent generations to maximize photoconversion capabilities.

47- Effects of Prevagen on Spatial Working Memory in Rats

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The cognitive-enhancing claims associated with Prevagen, a dietary supplement containing apoaequorin, were examined. The study focused on male and female Long-Evans rats, presenting an analysis of its effects on spatial working memory—an integral aspect of cognitive function. The assessment was conducted utilizing the Morris water maze, and the study was comprised of two phases: 1) a habituation period in which animals received a condensed milk treat, and 2) an experimental period in which the control group received a condensed milk treat, while the treatment group received a Prevagen-containing condensed milk treat. Throughout the experimental phase, rats underwent maze assessments consisting of two trials: the sample trial involved rats discovering a platform through trial and error, and the test trial required the recall of the platform location using working memory. In addition to spatial working memory, effects of the drug on body weight, food intake, and circadian activity were observed. It was hypothesized that Prevagen would enhance spatial working memory but have no significant effects on body weight, food intake, or circadian rhythm. Findings revealed that Prevagen administration did not yield any significant alterations in spatial working memory, body weight, food intake, or circadian activity in rats.

49- Effects of Lead (Pb^{2+}) Exposure on Planarian Brain Development and Neurobehavioral Phenotypes

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Lead (Pb^{2+}) exposure during early development has been linked to neurodevelopmental disorders. To examine the impact of Pb^{2+} on brain development, we conducted a study focusing on neurobehavioral changes and brain anatomy in *Planaria*. Planarians were decapitated and exposed to various Pb^{2+} concentrations (0.1ppm, 0.25ppm, and 0.5ppm) for seven days. After seven days, half the group remained exposed to Pb^{2+} until day 14, while the other half wasn't exposed. Through confocal microscopy, we observed reduced gray matter volume in all exposed groups. Cell death was reduced in all groups compared to the control, suggesting behavioral changes weren't primarily caused by cell loss. Animals continuously exposed to Pb^{2+} for 14 days didn't exhibit significant behavioral differences compared to day 7. Gray matter reduction became more pronounced after 14 days, accompanied by minimal cell death in all exposure groups. Planarians in lower Pb^{2+} concentration groups, despite lacking behavioral phenotypes, showed hyperactivity, increased exploration, and cognitive impairments. These planarians exhibited significantly reduced gray matter volume and increased cellular proliferation, indicating compensatory mechanisms after Pb^{2+} withdrawal. Our findings suggest that Pb^{2+} exposure induces a persistent behavioral phenotype in planarians, alongside anatomical and cellular changes relevant to understanding Pb^{2+} toxicity in humans.

51- Developmental PFOA Exposure Increases Neural Activation in Sensory Neurons and Induces Behavioral Pathology Relevant to Autism Spectrum Disorders

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Perfluorooctanoic acid (PFOA) is a widely present environmental contaminant found in various consumer products and food sources. PFOA has been linked to negative health consequences, some of which include disrupted reproductive, endocrine, and immune system function, as well as an increased risk of cancer. In this study, we investigated the impact of early developmental exposure to PFOA on behaviors related to autism spectrum disorders (ASD) using the species of planarian *Dugesia dorotocephalata*. We focused on examining locomotor activity, exploratory behavior, social aggregation, and sensory neuron activation in the planarians. The animals were exposed to three different concentrations of PFOA (20, 200, and 2000 PPT) immediately after decapitation and throughout the initial seven days of neurodevelopment, which allows for full brain regeneration. Our findings demonstrate that PFOA exposure during early development induces increased sensitivity to chemical cues from other planarians, hyperactivity, atypical exploration of novel environments, including repetitive turning, and impaired social clustering. We propose that the altered sensory processing resulting from PFOA exposure contributes to these behavioral changes, which closely resemble behaviors observed in individuals with ASD.

53- Alcohol Consumption and Seizure Susceptibility Modeling: Bicuculine Induces Seizure Relevant Activity in Planaria Chronically Exposed to Ethanol (EtOH)

Arpaio, Ralph
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Alcohol use disorder is a public health issue associated with various physical and mental complications. Chronic alcohol exposure is known to increase seizure risk. Animal models, particularly ethanol (EtOH) exposure, have been widely used to study alcoholism effects. Chronic EtOH exposure induces brain and behavioral changes, affecting neurotransmitter systems. Our study aimed to determine if chronic alcohol exposure heightens seizure susceptibility using bicuculline, a GABAa receptor inhibitor. Two experimental conditions were conducted. In one condition, planaria were exposed to 0.1% EtOH for seven days, followed by testing seizure-like activity after exposure to increasing bicuculline concentrations (0uM-100uM) for three minutes in an open field. In the second condition, planaria were exposed to EtOH for 14 days, experienced a day of withdrawal, and then received bicuculline concentrations (2uM, 20uM, and 200uM) for ten minutes in an open field. Our results showed chronic EtOH exposure increased seizure-like activity susceptibility in planaria after withdrawal. This suggests GABAergic neurotransmission plays a role in the mechanism of chronic alcoholism and seizure susceptibility. Planaria can serve as a high throughput model for alcohol toxicity and therapeutic testing. Overall, our study demonstrates the relevance of chronic alcohol exposure in seizure susceptibility, implicating involvement of GABAergic neurotransmission.

55- Protein Targeting of Amyloid Precursor Protein in Cultured Chick Neurons

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The amyloid precursor protein (APP) is widely expressed in the central nervous system and appears to play a key role in the pathogenesis of Alzheimer's disease. Understanding the normal targeting and processing of the APP protein in neurons will provide insight into the mechanisms that result in the pathophysiology associated with Alzheimer's. We have expressed both, a FLAG-tagged human APP and a GFP-tagged human APP construct in cultured embryonic chick forebrain neurons and visualized each one's distribution using immunocytochemistry and/or fluorescent microscopy. Preliminary data suggests that the APP protein is expressed in both the somatodendritic (cell body and dendrites) domain and axons of the cultured chick neurons consistent with data in other systems.

D. Physics, Chemistry

57- Integrating Topological Data Analysis and Machine Learning for Predicting Protein-Ligand Binding Affinities

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Determining the binding free energy of proteins and small molecules is computationally intensive and experimentally expensive but frequently a vital step for drug design. To circumvent this challenge, simple empirical models are typically used to estimate binding free energy for candidate drug molecules. These models typically rely on numerous ad hoc assumptions regarding binding chemistry and lack a consistent method for translating chemical information into a predictive model. In this work we combine topological data analysis with machine learning to build predictive models for protein-ligand binding without these somewhat arbitrary assumptions. Specifically, we featurize the atomic coordinates of protein-ligand complexes into a fixed-length vector representation known as a persistence image. This image captures the chemical interactions involved in binding as a collection of topological shapes across a range of length scales. Protein-ligand complexes from the PDB Bind dataset are converted into persistence images and with their known affinities are used as inputs and labels for machine learning, using 5-fold cross-validation. Our preliminary results are of similar quality to the aforementioned methods. We are currently examining the performance of our method with deep neural networks as well as using unsupervised learning strategies to identify aspects of our model responsible for its performance.

59- HPLC Method Development for Cholesteryl Ester Pairs

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Method development for high performance liquid chromatography (HPLC) is a process employed to reliably obtain concentration data concerning the molecules of interest. This laboratory has developed a novel delivery vesicle composed entirely of cholesteryl esters, termed the Cholestosome™. These vesicles are made of binary combinations of two different cholesteryl esters. The goal for cholesteryl ester analysis by HPLC is to find parameters that separate the retention times for each cholesteryl ester far enough to avoid any overlap in the detection peaks. The actual retention times of the esters may differ between columns, however, the difference in retention times is the result of interest. The ability to separate the two cholesteryl esters is crucial to being able to accurately calculate the concentration of each ester. Accurately determining the amount of these esters in the Cholestosome preparations is a pre-requisite for determining the percentage yield of the esters, an important quality assurance issue in the formulation process. The total lipid amount in the formulation of the vesicles is in turn critically important for determination of the amount of encapsulated active pharmaceutical ingredient (API). Using the current method developed for cholesteryl laurate and cholesteryl myristate as a starting point, methods were developed to examine the behavior of pairs of cholesteryl esters with both shorter and longer fatty acid moieties than myristic and lauric acid. It was found that for some ester pairs, the retention times overlapped and for some pairs, the retention times were indeed separated.

61- Optimizing Zinc Encapsulated Cholestosomes™ with Atomic Absorption Spectroscopy for Antiviral Therapeutics

Hildreth, Morgan; Hildreth, Morgan; Victor, Thomas; Mielnicki, Lawrence; McCourt, Mary
Niagara University; Lewiston NY 14109

Zinc is one of the metals required for the integrity of cellular processes important in immune regulation, but its intracellular concentration is tightly regulated. Studies have demonstrated that elevated concentrations of zinc ions can inhibit the replication of multiple RNA viruses, including the Coronavirus and influenza. A high viral load often leads to the progression of these viruses from infection to possible death. There is currently no general anti-viral therapeutic. This laboratory has explored the use of cholestosome

technology to deliver an intracellular dose of Zinc ions in an effort to reduce viral production. Cholestosomes are a patented platform drug delivery technology that uses neutral lipids (cholesteryl esters) to form a vesicle. Cholestosomes have the capability to encapsulate numerous molecules such as antibiotics and immunoglobulin (IgG). Cholestosomes™ can survive a pH range from 2-10, resist bile salt degradation and are capable of intracellular delivery. The objective of this study was to optimize the formulation of zinc nitrate encapsulated in Cholestosomes™. Then, to determine and refine an optimal Atomic Absorption Spectroscopy (AAS) assay for analyzing the concentration of encapsulated zinc. The construction of a zinc nitrate standard curve allows for diluted samples containing zinc to be analyzed. This provides a procedure for the analysis of the amount of zinc encapsulated in Cholestosomes™.

63- Cholestosome™ Encapsulated PARP Inhibitors in Triple Negative Breast Cancer (TNBC) Cells

Bednarz, Kathryn; Trapasso, Michael; Cegielski, Alex; D'Alberto, Cecilia
Niagara University; Lewiston NY 14109

Estrogen (ER), progesterone (PR), and human epidermal growth factor receptor 2 (HER2) are used to target cancer cells for treatment in breast cancer and approximately 85% of breast tumors present at least one of these markers. Triple-negative breast cancer (TNBC) is a breast cancer subtype that has the unique property of lacking the three major receptors used to characterize the majority of breast tumors: those of ER, PR, and HER2.. The outcomes for the 12-17% of women with this type of breast cancer are poor and in general African American women have a higher incidence of TNBC and have a significantly increased mortality rate. TNBC has a high rate of recurrence resulting in an even poorer prognosis in patients with recurrent disease. Recently, treatments that target Poly (ADP-ribose) polymerase-1 (PARP-1), a DNA replication and repair enzyme involved in apoptosis inhibition, have shown success in destroying TNBC cells, especially those with defects in DNA repair (e.g., BRCA mutations). This laboratory has developed a neutral lipid drug delivery vesicle termed the Cholestosome. This patented platform-based drug delivery system uses natural lipids (cholesteryl esters) to form a vesicle that can encapsulate a wide variety of molecules from small molecule drugs to peptides to antibodies. The present study has examined the ability of Cholestosomes to encapsulate Olaparib (AZD-2281), an FDA approved PARP-inhibitor. The effects of treatment with free or cholestosome encapsulated Olaparib were compared using TNBC cell lines.

E. Biochemistry, Molecular Biology

65- Hho1 and RSC as transcriptional regulators: An analysis of *in vivo* interactions between Hho1 and RSC with H3 in *Saccharomyces Cerevisiae*

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To fit within the nucleus, DNA organizes itself into several compacted levels. DNA wraps around histone proteins condensing into chromatin. 168 bp of DNA are wrapped around the histones to create multiple repeating units called nucleosomes. To ensure that the DNA stays associated with the nucleosome, a linker histone, H1 (Hho1 in yeast), is required. It acts as a "staple" binding to the nucleosome and DNA, ensuring that it cannot become unwound. For gene expression the nucleosome must be altered whereby DNA being transcribed is separated from the nucleosome, requiring post translational modifications (PTM) of histone proteins. Literature suggests that the RSC remodeler complex and Hho1 are involved in direct protein-protein interactions and that Hho1 mediates contacts with histone H3. RSC, an ATP-dependent chromatin remodeler, is required for transcription initiation. RSC and Hho1 work antagonistically and details for their interactions are yet unresolved. We investigate RSC and Hho1 contact sites to histone H3 using a synthetic amino acid, p-benzoylphenylalanine, expressed site-specifically into H3 via an expanded genetic code. Employing cell lines that express myc-tagged versions of Hho1 and RSC subunits, we identify contact sites between the histones and the RSC complex to further our mechanistic understanding of their actions.

67- Development and characterization of stimuli-sensitive liposomes

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The field of nanomedicine, which employs various nanoparticles, has been shown to be effective for the treatment, diagnosis, and prevention of disease. For example, lipid-based nanoparticle vehicles have been developed that allow for increased bio-absorption and greater tissue selectivity of drugs as tracked by MRI contrast agents. The development of stimuli-sensitive liposomes whose integrity may be selectively perturbed by temperature, pH, and ultrasound would provide additional treatment specificity. This project investigates the formulation and characterization of thermosensitive liposome preparations for future controlled release of contrast agents towards theranostic MRI applications in mouse tumor models. Initial liposome preparations were loaded with a carboxyfluorescein as a fluorescent marker of liposome encapsulation and integrity at various temperatures. Characterization of the temperature sensitive liposomes include particle sizing, zeta potential, UV/Vis absorption, fluorescence assays.

69- Non-thermal plasma as an effective therapy of the squamous cell carcinoma. *In vitro* and *in vivo* potential

Poplavskyi, Maksym; Zucker, Shoshanna; Gulledge, Brandon; Shaan, Ishfar
D'Youville University; Buffalo NY 14201

Squamous cell carcinoma is a common form of head and neck cancer derived from the squamous cells of the mucosal head and neck surfaces.1 Non thermal plasma (NTP) is a method of plasma generation which does not require thermal energy to get generated. It induces reactive oxygen (ROS) and reactive nitrogen species (RNS) by ionization of the passing neutral gas with electromagnetic, microwave, radio frequencies and electric fields.2,3,5 NTP has been proven in its efficacy as an experimental therapy in a number of cancers including the pancreatic one.2,6 From this it was hypothesized as NTP being a viable endoscopic therapy for head and neck cancer with the SCC7 cell line being used as a model of head and neck squamous cell carcinoma. To test this assumption, in vitro and in vivo models were used. Since the therapy had significantly decreased in vitro survival of the cells, the outcomes of treatment were assessed in the vivo murine model. SCC7 was selected as a mouse derived SCC allowing for a syngeneic model, thus, immunocompetent mice to be used. The tumors were treated with the NTP beam for 1 minute. Finally, the study revealed the high potency of NTP therapy against the SCC7.

71- TPZ Transport and Quantification

Malynych, Yaroslav; Gulledge, Brandon; Gamal, Rayan
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A combination therapy of Non-Thermal Plasma(NTP) and a prodrug Tirapazamine (TPZ) has previously been explored as a potential therapy for a number of cancers both in vitro and in vivo.1,2,3,4 This previous work has shown the up regulation of gap junctions by NTP, which has been hypothesized as a potential mechanism of transport for TPZ through the cytoplasm of adjacent cells.4 NTP also functions to produce Reactive Oxygen Species (ROS) and Reactive Nitrogen Species (RNS), which are believed to be how NTP enacts its cytotoxic effect.5,6 However with this production of ROS and RNS it was hypothesized that membrane permeability changes due to oxidation of the phospholipid membrane may be a competing or co-occurring mechanism enhancing the uptake of TPZ by cells treated with NTP.7,8 To test these two mechanisms of drug transport a Parallel Artificial Membrane Permeability Assay (PAMPA) was used to assay membrane permeability changes due to NTP. The cytoplasmic contents of genetically modified melanoma cells (1205Lu) were used which either contain plasmid (P), Connexin43 (C), and a dominant negative (T), were assayed using HPLC to quantify changes in the uptake of TPZ due to the presence or absence of functional Connexin43. These findings indicate NTP can be used to enhance drug transport.

73- NF-κB Signaling Regulates the Proliferation of Müller Glia-Derived Progenitor Cells in Acute Damage of Zebrafish Retina

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Inherited Retinal Diseases in humans can cause significant and total vision impairment mainly due to the fact that humans have no way of replacing photoreceptors after photoreceptor cell apoptosis or ablation. However, zebrafish have biological mechanisms that are able to regenerate photoreceptors after acute damage. Specifically, it has been previously thought that reactive microglia migrate and release proinflammatory cytokines that induce proliferation of Müller glia. These Müller glia, which span across the inner and outer nuclear layer of the retina, have stem-cell like potential that can asymmetrically proliferate to produce progenitor cells that are able to then mature into various cell types in the retina including photoreceptors. Previous research has shown that inflammation is essential in initiating photoreceptor regeneration from Müller glia proliferation. Due to the role of inflammation, the current study assessed the role of Nuclear Factor-κB (NF-κB) pathway and found that the inhibition of NF-κB pathway increased the proliferation of Müller glia-derived progenitor cells following acute injury. In addition, Müller glia proliferation was unaffected by the absence of microglia showing that pro-inflammatory cytokines from reactive microglia are not essential to photoreceptor regeneration.

75- Utilizing Sulforaphane in novel Non-Thermal Plasma and Tirapazamine treatment in pancreatic cancer cells

Shaan, Ishfar (University at Buffalo); Zucker, Shoshanna; Gulledge, Brandon; Poplavskyi, Maksym
D'Youville University; Buffalo NY 14201

Pancreatic cancer, with a five-year survival rate below 10% in 2020, remains a significant challenge. A novel treatment using the prodrug Tirapazamine (TPZ) and Non-Thermal Plasma (NTP) has shown promise in several malignancies, including melanoma and glioblastoma. This combination therapy utilizes TPZ's activation in hypoxia. The hypoxic core of a solid tumor converts TPZ to a reactive form that functions as a topoisomerase II inhibitor. NTP has been previously shown to produce reactive oxygen and nitrogen species inducing DNA damage and apoptosis. Combined, the NTP+TPZ therapy increases apoptosis and the oxidative stress response. Existing research on the phytonutrient sulforaphane suggests it upregulates Connexin-43 (Cx-43) gap junction regulation in pre-metastatic BXPC-3 and metastatic ASPC-1 cell lines. Since Cx-43 has demonstrated expansion of the area of cell death through transportation of ROS molecules and drugs, it was hypothesized that upregulating Cx-43 could be used to deliver cytotoxic treatments with NTP+TPZ. To test this, the cytotoxicity of NTP+TPZ with sulforaphane was tested in-vitro. Endothelial-Mesenchymal Transition (EMT) markers like the downregulation of E-Cadherin, upregulation of N-Cadherin and vimentin, and cellular characteristics were measured to determine whether sulforaphane effectively reduces EMT behaviors in ASPC-1, leading to pre-metastatic phenotypes, and the efficacy of the NTP+TPZ treatment.

77- Uncovering the Mystery of Hho1: Insights into Chromatin Remodeling and Gene Regulation

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Chromatin is assembled through repeating units of nucleosomes, consisting of DNA wrapped around an octameric unit of histone proteins (H3, H4, H2A, and H2B). When DNA is associated with a nucleosome it is silenced and must be unwound from the histone proteins to be used for processes such as replication and transcription. Recent research substantiated that the linker histone, Hho1 in yeast, has an inhibitory effect on transcription. Interestingly, Hho1 binds directly with the RSC complex, a well-known activator of transcription. It appears that Hho1 and RSC (specifically the Rsc2 subunit) work in contrast to each other but why they functionally interact is yet unknown. We employ an expanded genetic code to express Hho1 that harbor the crosslinking amino acid p-benzoylphenylalanine. These crosslinking probes allow the monitoring of specific interactions between proteins of interest allowing us to document the unknown mechanisms associated with Hho1 and RSC. Using immunoprecipitation and western blot analysis we detect these interactions by the presence of the HA-tag, on the histone, and a myc-tag on the Rsc2 protein,

providing insight into the dynamics of their functional contacts. Here, we set the foundation for unraveling the mystery into the H1 histone and its role in suppression of RSC.

Genetics (GEN), Ecology/GEN

79- Genomic Analysis of Bacteriophage Pimento
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Bacteriophages are viruses that infect and kill bacteria without negative effect on human or animal cells. Their uses include; treatment of bacterial infections, waste-water treatment, phage therapy and vaccinations. In this research, we focused on annotating and analyzing the bacteriophage Pimento of the Genus *Gordonia*. The phage was discovered by Cameron Kedy and Hari Kotturi in 2019 in Oklahoma. It was isolated at 28°C. It was sequenced using Illumina Platform. Its genome length is 49994 base pairs. Pimento exhibits a guanine-cytosine content of 66.9%, with a 3' Sticky Overhang. Our goal is to understand the architecture of Pimento's genome, identify its protein coding segments and predict the function of Pimento's genes. Through programs such as GeneMark, DNA Master, and Glimmer, we revealed the genetic landscape of Pimento, identifying critical genes responsible for tail functions, including assembly, chaperone activity, and host interaction. Functional predictions using HHPred, BLAST, and Phamerator revealed roles of these genes, with notable emphasis on tail assembly chaperones in ensuring proper phage structure and function, facilitating DNA injection into host bacteria. Our research provides understanding into the genomic and functional characteristics of the bacteriophage Pimento, contributing to the broader understanding of bacteriophage genomes.

81- Phenotypic Screening of *Saccharomyces cerevisiae* Identifies the Role of Spatial Positioning on Gene Expression Across a Targeted Genomic Region on Chromosome VII
Dotto, Michael; Newbauer, Vanessa
Le Moyne College; Syracuse NY 13214

Spatial positioning significantly influences gene expression. This was first observed in yeasts and flies, where reporter genes integrated into heterochromatin regions were silenced, a phenomenon known as the 'Telomere Proximal Effect' and 'Position Effect Variegation.' Systematic screening revealed high variance in gene expression on a locus-by-locus basis. Some genomic regions are highly susceptible to changes in gene expression following targeted genetic manipulation, a phenomenon known as the 'Neighboring Gene Effect.' This effect is widespread enough to result in the misannotation of gene function in 10-15% of cases. The genomic region surrounding *PCP1*, a mitochondrial serine protease, was susceptible to position effects triggered by deletion of the proximal genes, *MDR1* and *GTF1*. This results in a synthetic aerobic respiration deficiency due to the disruption of *PCP1* expression. This phenomenon appears to be limited to specific environmental and nutritional cues.

83- Systematic Screening of Mitochondrial Mutants for Neighboring Gene Effect in the Budding Yeast, *Saccharomyces cerevisiae*
Newbauer, Vanessa; Dotto, Mike
Le Moyne College; Syracuse NY 13214

This study systematically screens mitochondrial mutants in *Saccharomyces cerevisiae* to explore neighboring gene effects. Emphasizing the role of promoters, enhancers/repressors, transcription factors, and chromatin modifiers, we investigate the correlation distance (dexp) of neighboring genes in the yeast genome. With *S. cerevisiae*'s significance as a microbial factory for biofuel and chemotherapeutic metabolite production, we focus on non-essential mitochondrial mutants identifiable by the petite phenotype. Our approach involves identifying mutants, performing phenotypic screens, and conducting growth monitoring, followed by gene expression analysis (RT-PCR) and genetics validation. Optimization of growth and culture conditions, plating under positive pressure sterile workspace, and addressing water filtration issues contribute to the study's progress. The ultimate goal is to characterize the complete petite

mutants and understand the extent of neighboring gene effects and interactions in this model organism.

85- Investigating the biological mechanism underlying *Varroa destructor* resistance in a population of European Honeybees (*Apis mellifera*)

Besnilian, Alexander; Cullinan, Kevin
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Pollinator species play an integral role in plant reproduction. Therefore, it is difficult to overstate the importance of pollinators for agricultural and ecological systems. Currently it is estimated that approximately 90% of flowering species, including crop species, rely on animal pollination. Overall, bees are the most dominant taxonomic group amongst pollinators, of which the honeybees are arguably the most important taxa. The ectoparasitic mite, *Varroa destructor*, is the largest threat to honeybee health and sustainability worldwide. The mites vector viruses to the colony and ultimately that develops into a lethal epidemic for the colony and causes collapse. There are currently two strategies for controlling mite populations within domestic honeybee colonies: chemical insecticides to remove mites and selective breeding for bee behaviors that infer a level of mite resistance to reduce mite infestation. Unfortunately, neither of these practices are sustainable as long-term solutions to the mite problem. However, globally there are several wild honeybee populations that have survived mite infestation for long periods of time without mite management. These populations may represent sustainable co-adaptation between mites and honeybees and investigating the host-parasite adaptations in these populations may lead to answers regarding how honeybees and mites can maintain a stable interaction. One such resistant population was identified on the Swedish Island of Gotland. In this work we infect the resistant Gotland bees and non-resistant bees with the Varroa mite. Then we sampled pupa at timepoints following the infection. The goal is to conduct volatile comparisons and RNA-Seq to identify the molecular basis of mite resistance in this population.

87- DNA Extractions to Identify Meiofauna in Sediment from a Disturbed Shoreline

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Meiofauna are a diverse group of benthic invertebrates that range between 0.04 mm and 1mm in size. They represent 24 of the 35 animal phyla and are ideal for biomonitoring. Their fast population turnover means that community composition can indicate anthropogenic influence and environmental health. The long-term goal of this project is to determine if visual identification of meiofauna at the level of phyla is sufficient to investigate community changes along a disturbed shoreline (Seaside Park; Bridgeport, CT); or if it is necessary to identify lower taxonomic levels via DNA metabarcoding. The latter would allow for the identification of taxa at genus or species levels based on a short variable region in the DNA. We previously optimized a protocol to extract DNA from the sediment samples using the Qiagen DNeasy PowerSoil Pro Kit. Currently, we aim to generate high quality DNA extractions from sediment samples that range across time and space. Our ultimate goal is to conduct PCR on these extractions and amplify a variable region of the 18S rRNA gene, then sequence these amplicons to identify taxa within the sediment samples.

89- An Investigation of Neighboring Gene Effects on Plasmid Retention in *Saccharomyces cerevisiae*

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This study investigates the impact of neighboring gene effects on the *PAH1* locus, crucial for plasmid retention in *Saccharomyces cerevisiae*. Utilizing the *KanMX* Knockout module, non-essential neighboring genes proximal and distal to *PAH1* were deleted to discern if their absence could disrupt *PAH1* functionality, leading to a *PAH1* deletion phenotype, despite intact *PAH1*. Plasma maintenance assays were conducted using selective plates, employing histidine and uracil auxotrophic markers. The investigation aimed to elucidate whether neighboring gene effects observed in prior studies, hold under current conditions, particularly at the *PAH1* locus. Additionally, the study sought to determine if differences in plasmid inheritance exist between partitioning methods and auxotrophic markers. Results indicated a potential

influence of neighboring gene deletion on *PAH1* function and demonstrated variability in plasmid inheritance based on partitioning methods and marker types. Understanding these effects provides insights to optimizing plasmid maintenance strategies in *Saccharomyces cerevisiae* for biotechnical and pharmaceutical purposes.

Poster Abstracts

Session II.

A. Environmental Sciences (ES), ES/Toxicology, ES/Botany

20- Unveiling the Hidden Threat: Forever Chemicals in Ithaca, NY's Water
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Commonly referred to as forever chemicals, PFAS are widely used, long-lasting chemicals which break down very slowly over time. PFAS are a class of 15,000 compounds that are in many commonly used household items, such as nonstick cookware and water-resistant clothing, and due to their abundance and persistence, they frequently make it into our waterways. We collected stormwater samples from three major roads in Ithaca, NY for data analysis, we also compiled data from wastewater and drinking water facilities. Combining these data sets gave us insight into PFAS concentrations in the community. In wastewater influent, effluent, and biosolids, 15 of the 24 compounds tested for were found above reporting limits. There were no compounds found above the reporting limit in the drinking water out of the 29 that were tested for. In the stormwater samples, there were 2 of the 29 compounds tested for that were found above reporting limits. This data gives the Ithaca community reassurance that though these compounds are readily found in water samples, the concentrations in the Ithaca Area are quite low.

22- The Environmental Persistence of Tire Wear Particles in Ithaca, NY
Sulca, Adriana
Ithaca College; Ithaca NY 14850

Tire wear particles (TWPs) that shed from tires during brake and/or acceleration on the roadways are associated with many negative health impacts. Stormwater runoff contains a mixture of sediment, chemical, organic, and physical pollutants that can leach into Cayuga Lake. The Ithaca College ecotoxicology research team started collecting dry and wet samples last year to identify the concentrations of TWPs in Ithaca, NY. Wet samples included 3 bottled storm water from drains during rain events and snow samples from Ithaca College campus parking lot. Dry samples included swept up 1m2 sections of road dust in parking lots that included storm drains in the downtown area. The purpose of the dry samples was to determine the general presence of TWPs in the Ithaca area, specifically parking lots as they tend to have a lot of vehicular traffic. All samples were brought to the laboratory, sieved, digested, vacuum filtered, density separated, imaged and counted. We are in the process of analyzing more samples to understand how TWPs persist in the environment. Our initial results have all seen various sizes of TWPs; including 19-14,000 TWPs per L in wet samples and 8,000-15,000 TWPs per square meter in dry samples.

24- METHOD DEVELOPMENT: Impact of habitat fragmentation and change in effective population size on Eastern redback salamander, *Plethodon cinereus*
Van Lieshout, Clare; Edwards, William J.
Niagara University; Lewiston NY 14109

Eastern redback salamanders (*Plethodon cinereus*) are the most abundant vertebrate in the Northeast United States. Populations of these woodland salamanders have become fragmented due to human development. To assess the impact of habitat fragmentation on eastern redback salamanders along the Niagara Gorge, we investigate changes in effective population size between fragmented and intact populations. Habitat fragmentation can cause reduced genetic variation within local populations due to allele loss from population bottlenecks due to natural or anthropogenic factors Typically, larger fragments

or populations are thought to have reduced loss of genetic diversity and a larger effective population size. We amplify microsatellite loci from historical (2008) and current DNA extracted from salamander tail samples from both fragmented and intact populations. We analyze the microsatellites by MetaPhor agarose gel electrophoresis after PCR. Historical and current sequences show loss of microsatellite alleles in the two populations over the decade timeframe. Additional samples and loci will be needed to demonstrate the effect of fragmentation over a short period of time. This research will provide us with future insight on the effects of fragmentation in other (endangered) salamander populations.

26- Exploring AMGs and Their Impact on Photosynthetic Genes in Devil's Bathtub

Kiedrowski, Alexandra; Marnocha, Cassandra; Edwards, William J.
Niagara University; Lewiston NY 14109

Bacteriophages commonly integrate auxiliary metabolic genes (AMGs) into the host genome, supporting the phage survival by boosting cellular metabolic efficiency. Phage AMGs can direct carbon fixation and utilization in hosts, fundamentally changing the carbon cycling of an environment. The interactions between phage and host are complex, particularly in aquatic systems. The permanent stratification and physiochemical gradients of meromictic lakes allow us to study the impacts of phages and AMGs along these gradients in the water column. Devil's Bathtub (DBT; Rochester, NY) is a ferruginous meromictic lake studied for its phototrophic communities and biogeochemical cycling. To understand how bacteriophages and AMGs may influence carbon cycling in DBT, we conducted metagenomic sequencing of water samples from every meter in the water column to compare fluctuations. We have found phages from the *Myoviridae*, *Phycodnaviridae*, and *Siphoviridae* associated with cyanobacteria in the photic zone. By characterizing these viral genomes, we can determine associations between host phylogeny and AMGs, whether AMGs are correlated with things like depth or host type, and if the genomic context of an AMG is related to its frequency among bacterial genomes. Overall, this work should contribute to our understanding of the viral impacts to biogeochemical cycling in meromictic lakes.

28- Impacts of two different urban agriculture growing systems, hydroponics and aeroponics, on Great Lakes lettuce variety in terms of harvest yields and root lengths

Capin, Justin; Patel, Diya
Saint Peter's University; Jersey City NJ 07306

Hydroponics and Aeroponics are two agricultural farming methods utilized in urban spaces which can allow for more efficient crop harvests compared to traditional field cropping systems. In addition to a reduction in negative environmental impact that result from pesticides, fertilizers and soil loss, these farming systems can grow food in urban areas close to the consumer. Harvest yields and root lengths of the Great Lakes lettuce variety, *Lactuca sativa*, were compared. The results showed a significant difference between the two systems. The lettuce grown in the aeroponic tower system not only produced more in terms of harvest, but it looked more full and grew longer and healthier roots compared to the lettuce grown in the hydroponic stack system. In line with our original hypothesis, it can be concluded that the Great Lakes Lettuce variety performs better in an aeroponic tower system as opposed to a hydroponic stack system. This type of experimentation can be further used to investigate additional plant varieties with the conclusions being used to further the use of these more effective and environmentally conscious forms of agricultural farming.

30- Examination of Tomato and Basil Plant Germination & Growth in a Hydroponic System Versus Traditional Soil Conditions

Guido, Gianna Maria
Saint Peter's University; Jersey City NJ 07306

Plant cultivation has shown tremendous advances in recent years especially in the area of hydroponics. Reduced carbon footprint, water usage, and soil disruption are some of the benefits. Comparable harvest yields are important to consider when considering a transition to hydroponics for food production away from traditional agriculture. This study looked at hydroponic versus traditional soil growing methods which were utilized to examine the growth and development of *Solanum lycopersicum* (sweet cherry tomato) and *Ocimum basilicum* (Genovese basil) plants. For each plant variety, fifty seeds were dispersed within a

precise soil arrangement, whereas the other fifty were placed in rockwool for hydroponic cultivation. Growth of the plants were measured within the two systems on a scheduled weekly basis, a week after seeding. Results indicate that hydroponically grown tomatoes and basil germinate at a higher rate and develop quicker, accelerating the measured growth when compared to the soil system. Hydroponic farming can be considered an alternative for sustainable agriculture in urban areas, specifically seen through its numerous benefits such as efficient utilization of space, water conservation, and higher yields.

B. Ecology, Ecology/ES, Ecology/Botany, Behavior

32- Comparison of aquatic invertebrate communities on native coontail (*Ceratophyllum demersum*) and invasive Eurasian watermilfoil (*Myriophyllum spicatum*)

LoBasso, Gianna
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Aquatic ecosystems face significant challenges due to invasive plant species, which often outcompete native vegetation and disrupt ecological balance. Likewise, invasive plants can contribute to changes in aquatic invertebrate communities. Understanding the dynamics between native and invasive aquatic plants is crucial for effective ecosystem management and conservation efforts. This study compared invertebrate community composition and abundance on native coontail (*Ceratophyllum demersum*) and invasive Eurasian watermilfoil (*Myriophyllum spicatum*). Whole plants (n = 8 per species) were collected from Pickett's Pond in Derby, Connecticut and bagged individually. Invertebrates from each plant were rinsed into the bag, sieved out, and preserved in 70% ethanol for identification and enumeration, and the total length, wet mass, and dry mass of each plant was measured to standardize invertebrate counts to plant size. Preliminary analysis suggests that the native and invasive species support similar invertebrate abundances, but invertebrate community composition could vary between plant species. Further data analysis via Analysis of Similarity (ANOSIM) is underway. These results will inform management actions against invasive species in aquatic systems by documenting mean length and biomass per individual plant, which available literature lacks, and noting that these plants may not always reduce invertebrate abundances or alter community composition.

34- Effects of seed source and sediment composition on seagrass germination and seedling Performance

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The global decline of seagrass meadows urgently requires finding consistently effective restoration methods. Recently, there has been increased interest in seed-based methods of seagrass restoration. However, these methods have had mixed success, with highly variable outcomes. Relatively little is known about how sediment characteristics, including soil conditioning by seagrasses, may affect seed germination and seedling success in a restoration context. To examine the effects of seed source and sediment characteristics, we conducted a laboratory experiment using eelgrass seeds collected from different source meadows and sediment collected from vegetated and unvegetated areas at restored meadows, as well as commercial sand. We measured seed germination and seedling performance during the experiment, and assessed seed quality. We found pronounced differences in seed quality and seed germination among source meadows, but the effects of sediment conditioning on seed germination and seedling performance were more variable. Our results can be used to inform seagrass restoration in New England, suggesting that restorations sourcing seeds from multiple meadows and potentially including sediment inoculations may have greater success.

36- Restoring resilient marshes: success of northern and southern *Spartina alterniflora* in Stratford, Connecticut

DeJordy, Kaitlyn
Sacred Heart University; Fairfield CT 06825

Salt marshes, vital components of healthy coastal ecosystems, are declining globally, prompting increasing marsh restoration efforts. Exploring ways to increase marsh resilience to climate change is crucial for long-term success of marsh restoration projects. We conducted a field experiment to assess the performance of Spartina alterniflora from northern and southern sources in Connecticut. We hypothesized that plants from northern sources would perform best at our site, since several studies have suggested that locally sourced plants perform better than non-local plants. The experiment consisted of three treatments: 1) northern plants, 2) southern plants, and 3) a mix of northern and southern plants with 18 replicate pots of each. We counted the number of living shoots in each pot weekly throughout the growing season and measured height and diameter of ten shoots per pot at three time points. Pots with only northern plants consistently had the highest densities, followed by the mixed treatment, with the lowest densities in the southern plants. Although northern plants were generally taller than southern plants well into the growing season, southern plants had larger diameters. These results suggest that northern plants will grow better at northern restoration sites than southern plants, at least in the short term.

38- Patterns of Predation in a Declining Asian Shore Crab Population at a Marsh Restoration Site

McGann, Keith
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Hemigrapsus sanguineus (Asian shore crab) is an invasive crustacean that often outcompetes established species on the eastern seaboard and impacts biodiversity. Although it can have detrimental effects, the *H. sanguineus* population at a marsh restoration site at Stratford Point, Connecticut has declined since 2019. Understanding predation dynamics on Asian shore crabs can provide insights into the mechanisms driving this decline. We conducted a mark-recapture study to estimate *H. sanguineus* population size at Stratford Point as part of ongoing monitoring, yielding an estimated 33,913 crabs at the site in 2023, a 25% decline from 2022. A tethering experiment confirmed that marking did not increase odds of predation. To examine diurnal and tidal effects on predation on *H. sanguineus*, we performed two tethering experiments comparing crab survival 1) during the day and at night and 2) during high and low tide. Although Chi square tests showed no significant diurnal or tidal effects on crab survival, more research is needed to fully understand the dynamics present in these ecosystems and why this population continues to decline. We expect these trends to continue as the restored marsh matures, since previous work showed higher predation rates in vegetated vs. unvegetated areas at the site.

40- *Daphnia* diet in the lower Niagara River: field testing a 16S and 18S rRNA gene sequencing method

Wrobel, Samantha; Edwards, Ciaran; Marnocha, Cassandra
Niagara University; Lewiston NY 14109

Zooplankton regulate the flow of carbon and nutrients from phytoplankton to higher trophic levels. Previous investigations into phytoplankton food choice have focused on fatty acid profiles and stable isotopies, with recent efforts using sequencing of dissected guts of larger marine zooplankton. We have developed and lab tested a technique to determine diet content in a model small, freshwater zooplankton, *Daphnia*, using rDNA extraction through whole organism homogenization. In this study, we field tested this method by determining the diet of *Daphnia galeata* collected from the lower Niagara River, NY and compared this to the phytoplankton community. We extracted DNA from whole D. galeata and river water phytoplankton samples followed by amplicon sequencing of the 16S rRNA V3-V4 region and 18S rRNA V4 region. The *D. galeata* selected *Micrococcales*, despite *Frankiales* and *Microtrichales* being most prevalent bacterial genera in the water column, and chose *Monogononta* over the more prevalent alga *Cladophorales*, suggesting selective feeding. Moving forward, we will use this method successfully tested on *D. galeata* to characterize the diet of a selected Copepod species from the Niagara River. Our work will allow for further clarification of the feeding interactions and energy and nutrient cycling in freshwater systems.

42- Method Development: Diet characterization of *Daphnia magna* using whole organism DNA extraction, 16S rDNA, and next-generation sequencing

Edwards, Ciaran; Wrobel, Samantha; Marnocha, Cassandra; Edwards, William J.
Niagara University; Lewiston NY 14109

The role of zooplankton in linking producers to higher trophic levels is essential to understanding nutrient cycling. New approaches are needed for diet characterization of freshwater zooplankton as fatty acid profiles, stable isotopes, pigments, and molecular work on dissected guts are not practical for smaller organisms. Here, we develop a whole organism DNA extraction technique for a freshwater Cladoceran to assess diet through 16S rDNA sequences in controlled laboratory experiments. Lab raised *Daphnia magna* were placed in feeding microcosms containing three strains of *Synechococcus* for 24 h in varying ratios and a eukaryote, *Chlorella*, control. We separated the target V3-V4 region on an agarose gel and excised the band. We sequenced the V3-V4 amplicons using Illumina MiSeq and compared them to the sequences of the three feeding communities. We successfully sequenced the 16S rDNA of the organisms consumed by the *D. magna* during the feeding experiment. We quantified differences between the experimental community and the prey community and demonstrated the effectiveness of this new technique. This method will allow greater clarity in assessing trophic cycling of nutrients in freshwater ecosystems.

44- Is the Sun Shining Over the Hill? Comparison of Solar Radiation in Three Watersheds of the Dingle Peninsula

McManus, Mary; Pereira, Jillian
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Climate and Land Use and Land Cover (LULC) are two important components of ecosystems that affect water quality and communities living in the streams and rivers of a watershed. The conjoined Feohanagh, Milltown, and Owenmore River basins of the Dingle Peninsula in Ireland are similar in size but vary significantly in LULC. In two previous studies, substantial differences in microbial communities were also shown. Our current work focuses on understanding how differences in micro-climate might correlate with water-level and other physical parameters of the rivers and inform investigations of observed differences between the watersheds. In this poster, we analyze the solar radiation levels in the watersheds from data collected from automated weather stations installed in the three watersheds. Despite their conjoined nature, the three watersheds appear to differ in the amount of received solar radiation (particularly on a daily basis).

46- Get Out of the River! Rainfall and River Rise in Three Watersheds of the Dingle Peninsula

Ribaudo, Charlotte; Scheibl, Emma
Sacred Heart University; Fairfield CT 06825

Land-use and Land-cover (LULC), coupled with climatic conditions are important components of ecosystems that affect water quality in the streams and rivers of a watershed. The conjoined Feohanagh, Milltown, and Owenmore River basins of the Dingle Peninsula in Ireland are similar in size but vary significantly in LULC. Previous work had shown substantial differences in the microbial communities of the three main rivers in the watersheds. Our current work focuses on understanding how differences in micro-climate affects the water-level and other physical parameters of the rivers and informs investigations of the differences observed in the microbial communities between the rivers. In this poster, we present an analysis of the correlations between rainfall and water level in the lower regions of the three watersheds along with basic descriptions of the hydrogeologic characteristics of the watersheds. Despite their conjoined nature and similar size, the three watersheds differ substantially in river-level response to rainfall and their basic topographical characteristics.

48- Between a rock and a sandy place: Habitat Preferences and Aggregation Behaviors of Asian Shore Crabs (*Hemigrapsus sanguineus*)

Simonin, Emily
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The Asian shore crab (*Hemigrapsus sanguineus*) is invasive to many regions, including Long Island Sound. Even though Asian shore crabs consume conspecifics under certain circumstances, they tend to aggregate in large numbers under rocks along coastlines. This combined with their ability to adapt to diverse environments contributes to the species' successful establishment beyond native ranges. Our study investigated whether aggregations resulted from the presence of conspecifics or habitat preference. We

investigated habitat preferences by introducing crabs of varying sizes and numbers into tanks containing different microhabitats. Preliminary results suggest a preference for hiding under rocks regardless of size or the presence of other similarly or differently-sized crabs. Our results also agree with preliminary experiments suggesting that individuals do not exhibit heightened metabolic rates (a proxy for stress) in the presence of conspecifics, even though other studies documented some cannibalism and aggression between individuals. Further research is needed to understand the interactions between social dynamics and habitat preferences, which will be crucial for effective invasive species management and ecosystem conservation along Northeast coastlines.

50- Should I stay or should I go: Investigating aggregation behaviors in Asian Shore Crabs

Jacobson, Paul; Moore, James
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Asian shore crabs (*Hemigrapsus sanguineus*) are invasive along rocky, Northeast coastlines in the United States. Although these crabs often form aggregations between or under rocks to evade predators like birds and fish, they also exhibit cannibalistic behavior during periods of resource scarcity. Our project is part of a comprehensive study on Asian shore crab behavior and physiology when sharing intertidal refuges. We analyzed interactions between Asian shore crabs of varying sizes. During experimental trials, two crabs of different sizes were observed in an experimental arena for 10 minutes. We tracked their movements and proximity using Kinovea and quantified observed behaviors (e.g., aggression, resting, locomotion) using ethograms. Typically, the crabs were within the same half of the experimental arena and when they were in close they tended to display aggressive behaviors regardless of body size. Ultimately, this research, which aims to understand Asian shore crab behaviors, may aid in developing effective management strategies to control their populations and mitigate their ecological impacts in intertidal zones.

52- Examining factors that impact parasite load in Long Island Sound Horseshoe Crabs

Mancini, Alyssa; Lerner, Kyra
Sacred Heart University; Fairfield CT 06825

The American Horseshoe Crab (*Limulus polyphemus*) is an important part of the ecosystem on the Eastern coast of the United States. The population of horseshoe crabs in the Long Island Sound have been in decline in recent decades due to pollution and overharvesting. They are also susceptible to parasites, such as the limulus leech (*Bdelloura candida*). In 2023 the gills of horseshoe crabs (n=415) were observed along the Connecticut (CT) coast of the Long Island Sound to record parasite loads. The gill conditions were ranked and classified based on the percentage of the gills covered and the presence of mature parasites. The results of the study suggest that larger horseshoe crabs are significantly more likely to have a higher parasitic load. Preliminary analysis indicates that the beach location where horseshoe crabs were found also significantly relates to parasite load. This data has meaningful implications for horseshoe crab conservation and management in CT.

54- Assessing patterns of parasites in American Horseshoe crabs in Long Island Sound

Rabadi, Angelina
Sacred Heart University; Fairfield CT 06825

The American Horseshoe Crab (*Limulus polyphemus*) is an economically and ecologically important species with beneficial connections to human health. Horseshoe crabs in Long Island Sound (LIS) have been on the decline for decades due to habitat loss and overharvesting. Recently additional factors have been analyzed to assess if they are negatively impacting the horseshoe crab population, such as parasite infestation. The horseshoe crab flatworm, *Bdelloura candida* was analyzed to assess infestation patterns Long Island Sound horseshoe crabs. Data collected from horseshoe crabs (n=495) in 2019 was analyzed to see if there is any relationship between sex, shell condition (age proxy), and parasite infestation load. Preliminary analysis shows that the most crabs that were infested with parasites had higher shell conditions, indicating older age. Overall, there were more male horseshoe crabs that were infested compared to females, however the females that were infested had more intense infestations on average than males.

While further assessment is needed, the results of this study provide valuable insight into factors affecting the horseshoe crab population in LIS.

56- Allelopathic Influence of Eucalyptus on Common Agricultural Plants of China
Cruz, Maraya; Saldana, Catherine
Saint Peter's University; Jersey City NJ 07306

Eucalyptus trees, introduced to China, have been widely propagated across the county. These trees are suspected of releasing allelochemicals that can negatively influence nearby crops. This study examined the potential for an allelopathic influence on crops by adding different concentrations of leaf litter to the soil. IN addition, seeds germination was evaluated under different concentrations of aqueous Eucalyptus leaf solutions The Eucalyptus leaves were collected in China and the seed selections were based on agricultural products that are typically produced in China and include bok choy, tomato, and jalapeño pepper. Bok choy is native to China and has been grown for thousands of years, while tomatoes and jalapeno peppers are both introduced plants. As predicted, the bok choy had the largest impact with all plants having a reduced germination and growth under the highest Eucalyptus soil concentration. The tomatoes and jalapeño peppers also saw a reduction in growth in the highest concentration of Eucalyptus leaf litter. The results of the study could have important implications for how Eucalyptus is grown in the county and an important way to mitigate the impacts on nearby farms.

B. Microbiology, Microbiology/Molecular Biology, Microbiology/ES

58- Verification of CRISPR Cas-9 Gene Editing Through Genomic DNA Analysis
Abdulky, Katya; Marcum, Matty
Le Moyne College; Syracuse NY 13214

HIV targets various immune cells in the body, ultimately leading to immune failure (AIDS). Those targets include CD4+ T-cells, monocytes, and macrophages, and therefore directly and indirectly impact all aspects of the immune response. Using CRISPR Cas-9 gene editing technology we aimed to disrupt genes encoding cellular proteins we hypothesize affect HIV replication in model cell lines. The cell lines used were HEK293FT (kidney derived) and THP-1 (monocyte derived). The goal of this project is to confirm gene disruption by purifying total genomic DNA from experimental and control cells, performing PCR to amplify the CRISPR Cas-9 cut site, and sending the amplified DNA product to be verified by sequencing. We hypothesize that the successful gene disruption (out of frame) would be detected by gene sequencing.

60- Does the BacM-L protein N-terminus mediate protein-protein interactions at the cell membrane?
Willis, Avia
Iona University; New Rochelle NY 10804

BacM is an important protein for maintaining the proper shape of *Myxococcus xanthus* cells. It has two isoforms, BacM-L and BacM-S. The N-Terminus of BacM-L has an additional 23 amino acids relative to BacM-S. Mutant cells without bacM have a defective cell wall and crooked shape. When imaged by fluorescent microscopy, BacM-L localizes to the cell periphery. We reason that the additional 23 amino acids in BacM-L mediates protein-protein interactions and membrane localization. To identify possible BacM-L interaction partners, two plasmids were engineered: Control plasmid pDMZ307 contained GST fused to a 6x histidine tag; plasmid pDMZ308 has the same sequence but with the novel BacM-L sequence fused to the N-terminus. These plasmids were transformed into *M. xanthus* for protein expression. Translated proteins will be extracted using nickel beads that bind their 6x histidine tags, to isolate and identify interaction partners specific to BacM-L N-Terminus.

62- Establishing CRISPR-Cas9 Gene-Edited Cells for the Study of HIV
Root, Mary
Le Moyne College; Syracuse NY 13214

HIV proteins hijack the cellular CRL4 ubiquitin ligase complex to cause the degradation of proteins that function as part of the cell's defense against HIV. The CRL4 ubiquitin ligase complex contains CUL4, which can be either type A or B. Preliminary data suggests that the type of CUL4 that is abundant may affect the timing of HIV protein functions. In this project, CRISPR-Cas9 gene editing technology was employed to create knockout cell lines wherein either CUL4A or CUL4B are absent. We hypothesized that successful knockout will be reflected in a loss of CUL4A or CUL4B protein. Our data suggests a loss of CUL4A or CUL4B in target cell lines as indicated by western blot analysis. Ultimately, establishing these knockout cell lines will allow us to determine which of the two CUL4 types is more important for efficient HIV protein function. This knowledge may serve as the basis for the development of novel therapeutics.

64- The identification of secondary metabolite patterns across more than 600 genomes of the *Pantoea* species

Cusick, Robert
Wagner College; Staten Island NY 10301

Secondary metabolites are organic compounds that are produced by a variety of organisms. These secondary metabolites are often beneficial factors, with the ability to fortify or inhibit other organisms, leading to increased survivability for the producer organism. Genes for secondary metabolites are found within an organism's genome. Secondary metabolite production is not required for the growth and development of the organism instead the production is useful for understanding distinctions between genomes of a given genus. This project focuses on predicted secondary metabolites in *Pantoea spp*. *Pantoea spp*. are gram negative members of the *Enterobacteriaceae* family, mainly colonizing plants. With this experiment, we looked at 600 different genomes of the different *Pantoea spp*., predicting their secondary metabolites and their functions within the microbe using the bioinformatic tool antiSMASH. With this data, we aim to uncover the patterns presented in the secondary metabolites produced by the *Pantoea spp*. in relation to variables such as where the genomes were isolated from, and what species they are. *Pantoea* is an understudied species, with roughly 80% of *Pantoea* genomes not being used in comparative genomic studies, which allows for the possibility of many novel findings considering secondary metabolites within the 600 *Pantoea* species genomes utilized.

66- Photosynthetic versatility in a sulfide-tolerant cyanobacterium from Fayetteville Green Lake

Sweeney, Grace; Marnocha, Cassandra; Edwards, William J.
Niagara University; Lewiston NY 14109

Permanently stratified meromictic lakes experience dramatic environmental change across small vertical scales. Cyanobacteria in these lakes must be versatile to deal with varying availability of oxygen, sulfide, and light levels at their preferred locations in the water column. Sulfide, found in euxinic meromictic lakes, is a poison of photosystem II in oxygenic photosynthesis (oxyP). Some cyanobacteria have evolved the ability to detoxify sulfide by using it as an electron donor for anoxygenic photosynthesis (anoxyP) with an enzyme called sulfide:quinone oxidoreductase (gene: sqr). Our previous work on a *Synechococcus* isolate from Fayetteville Green Lake (Fayetteville, NY; FGL) has shown that the strain constitutively expresses sqr. What is currently unclear is whether the FGL *Synechococcus* can simultaneously perform oxyP and anoxyP. We will quantify the expression of psbA, a marker gene for oxyP, and sqr, a marker gene for anoxyP, following a sulfide addition. The ability to simultaneously perform oxyP and anoxyP in the presence of sulfide would indicate a photosystem II that is more resilient against sulfide toxicity. By maintaining metabolic flexibility, cyanobacteria may contribute to primary production through a larger section of the water column in meromictic lakes like FGL.

68- Antimicrobial Effects of Various Essential Oils

Fahey, Calla
Alfred State SUNY College of Technology; Alfred NY 14802

Essential oils have been used throughout history as a form of treatment for illnesses. While the use of essential oils was applied differently, depending on cultural practices, it is clear there was a strong benefit from using the oils. Currently, the medical community is being faced with the issue of antibiotic resistance.

This has become an increasing problem with little progress on finding a suitable solution. In this study, we tested the effects of the essential oils cinnamon bark, lavender, and bergamot on different microorganisms. A 1:1:1 ratio of a combination of these three oils was also tested to see if a mixture of these oils has a greater effect on inhibiting the growth of microorganisms. The clinically significant organisms tested were *E. Coli*, *P. aeruginosa*, *S. aureus*, *S. pyogenes*, *C. albicans* and *C. tropicalis*. Cinnamon bark essential oil had the best results for inhibiting the growth of all 6 selected organisms, at all four dilution factors.

70- The effect of Trifluoperazine on Melanin Production in *Cryptococcus neoformans*

Menon, Dante; Glazier, Virginia E.
Niagara University; Lewiston NY 14109

Cryptococcus neoformans is a fungus that causes severe illness in immunocompromised people ranging from cancer patients to type 1 diabetics. The antipsychotic trifluoperazine (TFP) has been found to inhibit the growth of *C. neoformans*, which may allow TFP to be repurposed as an antifungal treatment. Prior research has demonstrated that melanized *Cryptococcus* cells are more sensitive to the effects of TFP than cells without melanin. According to our preliminary data, TFP may also influence the production of melanin in *C. neoformans*. On agar plates with increased amounts of TFP we saw a reduction in the production of melanin using spot dilutions. It is not clear whether this is a direct result of TFP acting on melanin itself or a reaction of *C. neoformans* to TFP. To determine whether *C. neoformans* is modifying melanin expression we will assess the expression levels of laccase, the enzyme that produces melanin. By examining the mRNA levels of laccase, we will also investigate the precise mechanisms by which TFP influences the levels of melanin. Our investigation aims to identify the relationship between TFP and melanin in *C. neoformans*, which may have implications in the potential use of TFP as an antifungal treatment.

72- Screening local soil samples for actinomycetes with antifungal activity

Tischendorf, Ava; Wagner, Haley
Niagara University; Lewiston NY 14109

Fungi represent challenging targets for antimicrobial chemotherapy, and historically the search for novel antifungal compounds has lagged behind that of antibacterial drug discovery efforts. Nevertheless, the global burden of both human and animal fungal disease continues to increase, driven by a diverse range of factors including climate change, the emergence of fungal strains resistant to existing therapies, and growing populations of susceptible individuals. The order Actinomycetales - commonly referred to as actinomycetes - comprises a diverse group of pleiomorphic bacteria found worldwide in soils and sediments. A hallmark of this order is the large number of secondary metabolites they produce, including many potent antimicrobial compounds. Indeed, by one estimate almost 50% of natural product-based antibiotics currently in clinical use are based on compounds from just one genus of the order, *Streptomyces*, including the antifungal compounds candicidin and Amphotericin B. In this study we outline a low-cost approach to obtain and screen strains of actinomycetes for the production of antifungal metabolites against a panel of three fungal organisms including the human pathogens *Candida albicans*, and *Cryptococcus neoformans*, and *Batrachochytrium dendrobatidis*, the etiological agent of chytridiomycosis, which is believed to be a major driver of the dramatic decline of amphibian populations globally.

74- Isolation of *Staphylococci* and staphylococcal phage at an exotic animal farm

Werner, Ciara; Topolski, Grace; Gallo, Mark
Niagara University; Lewiston NY 14109

Staphylococcus aureus remains a significant pathogen in both human and animal health, with antibiotic resistance posing a growing concern. Bacteriophages have emerged as promising alternatives to antibiotics for controlling bacterial infections. In this study, we report the isolation and characterization of novel *Staphylococci* and staphylococcal phage from exotic animals. Nasal swabs were collected from various exotic animals housed at the farm. These samples were screened for the presence of *Staphylococcus* and its phages using standard microbiological techniques. Numerous bacteria and lytic phage were obtained from the animals. These findings underscore the potential of exotic animals housed at adventure parks as a reservoir for bacteriophage with therapeutic implications.

C. Physiology, Health Science

76- Risk Assessment of Heavy Metal Contamination in Herbs, Teas and Dietary Supplements
Garraway, Wynnade
Queensborough Community College; Queens, NY 11364

Heavy metals in medicinal plants are well documented but comprehensive health risk assessments are often lacking. It was hypothesized that herbs from local markets may be contaminated and calculating Target Hazard Quotient (THQ) would assess the health risks of daily exposure. The concentration of three essential trace elements (copper, iron and zinc) and four toxic, heavy metals (arsenic, cadmium, chromium and lead) were measured with Olympus Vanta portable X-Ray Fluorescent spectrometer. All samples tested negative for zinc, cadmium, and lead. The eight raw herb samples exceed WHO herb limits for arsenic (5 mg/kg). Two samples exceeded the limit for copper (73 mg/kg) and three exceeded the limit for iron (426 mg/kg). Maximum daily intake for each element was calculated and compared to established minimum risk levels. Chromium exposure associated with cinnamon capsules is above the NIH recommended adult intake of 25-35 ug/day. THQs of heavy metals in each sample were summed up to obtain the Hazard Index. Only ginger tea with HI = 0.5 was acceptable. All the other HI values are ≥1 with unacceptable health risk. Further research is needed to estimate this accumulation of toxic metals and to analyze dried herbs and supplements for uniformity between batches.

78- Effects of High-Sodium Chloride Diet on Anxious Behavior in Rats
Steinkuhl, Marie; Azzi, Sarah
John Carroll University; University Heights OH 44118

Given the prevalence of anxiety in the U.S. and rising processed food consumption, exploring the correlation between anxiety and high-sodium chloride diets is crucial. The current study investigates the impact of a high-sodium chloride diet on the anxiety of male and female rats. Twelve male and female Long Evans rats were assigned normal or high-sodium chloride diets, and their anxiety levels were measured using an elevated plus maze (EPM), with more time in the closed arms indicating more anxiety and more time in the open arms indicating less anxiety. Results indicated a significant shift in anxiety behavior, with experimental male rats spending more time in open arms by experimental week 3, possibly influenced by familiarity, age-related emotional maturation, and the suppression of the renin-angiotensin-aldosterone system under high salt intake. Female control and experimental rats consistently exhibited increased open arm time by experimental week 3, possibly influenced by estrogen. Male and female experimental rats displayed heightened water intake, and there were variations in body weight. Renal fat composition analysis suggested high-salt diet-induced changes, aligning with shifts in renal metabolic processes.

80- Investigating the Role of NF-kB Inhibition on Müller Glia Proliferation in a Chronic Disease State in the Zebrafish Retina
Mekhel, Rebecca
John Carroll University; University Heights OH 44118

Müller glia are the prominent retinal glial cells and exhibit regenerative potential in various species. This current study focused on Bardet-Biedl Syndrome (BBS), specifically the Bardet-Biedl Syndrome protein 2 (bbs2) mutation and its association with elevated nuclear factor kappa B (NF-kB) pathway signaling in zebrafish retina. Zebrafish with a bbs2 mutation were utilized to investigate the role of the NF-kB pathway in a chronic disease state through the administration of NF-kB activation inhibitor (NAI) to block the pathway. The role of the NF-kB pathway was investigated, hypothesizing that inhibition of the pathway would enhance Müller glia proliferation. The zebrafish were treated with NAI and immunohistochemistry stained which revealed a significant increase in PCNA-positive cells, indicating an increase in Müller glia proliferation. The study also included immunohistochemistry with specific antibodies, such as zpr1/PNA and 4C4, to assess cone photoreceptor damage and microglia activation, respectively. The study highlights the critical role of the NF-kB pathway in zebrafish retinal regeneration, providing insights for potential abilities to regenerate photoreceptors in retinal degenerative diseases. Further research is needed to

determine the role the NF-kB pathway has on the regeneration of photoreceptors as this study found an increase in the proliferation of Müller glia.

Index

Data is arranged as:

University

Last Name, First Name: Platform Presentation/Poster Number(s)

Ribaudo, Charlotte: 46
Simonin, Emily: 48
St. Clair, Julien: 17
Tsaglos, Mason: 34
Tucci, Mikayla: 87
Villarreal, Mateo: 31

Saint Peter's University
Capin, Justin: 28
Cruz, Maraya: 56
Flores, Junanyelis: 41
Guido, GiannaMaria: 30

University at Buffalo
Shaan, Ishfar: 75

Wagner College
Arpaio, Ralph: 53
Cusick, Robert: 64
Massaro, Ian: 9
Merlino, James: 49

Wilkes University
Martes, Nate: 29
Greybosh, David: 57
Savitski, Tyler: 11