WM RUGS

WEST MICHIGAN REGIONAL UNDERGRADUATE
SCIENCE RESEARCH CONFERENCE

PROGRAM

VIRTUAL CONFERENCE | **NOVEMBER 6–7, 2020**

CELEBRATING 14 YEARS OF SCIENTIFIC AND EDUCATIONAL COLLABORATION

ORGANIZING INSTITUTIONS:

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CALVIN UNIVERSITY
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ZOOM WEBINAR

Please use the following Zoom link, meeting ID and passcode to access live scientific talks and live Q&A sessions:

Zoom Link
https://zoom.us/j/99781250302?pwd=NnVRaHF5OUlsWHowaENPMU8vN2VmZz09

Meeting ID: 997 8125 0302
Passcode: 806527

SLACK

Please use the Slack link below to access posters and the chat / message discussion boards for Q&A sessions. If you have any technical issues with accessing the WMRUGS Slack Channels, please contact the Event Coordinator, Michelle Love at undergrad@vai.edu.

WMRUGS Slack Channels
https://2020westmichi-erx9169.slack.com/

Need support or have questions with Slack after logging in to this virtual platform? Use this help channel to send messages to the AV Support Team and/or Event Coordinator.

WMRUGS Help Slack Channel
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If you have any URGENT questions or concerns with Slack, contact Michelle Love at 616-234-5581.

Friday, November 6, 2020

Virtual Conference

4:00 pm – 4:15 pm EST	Welcome | Title Sponsor Presentation **Steve Triezenberg, PhD** Dean, Van Andel Institute Graduate School and WMRUGS Master of Ceremonies	Zoom
4:15 pm – 5:00 pm EST	Keynote Speaker and Q& A Session **Renã A.S. Robinson, PhD – Vanderbilt University** Associate Professor of Chemistry ***"Comprehensive Proteomics and Lipidomics Strategies to Advance Disparities Research in Alzheimer's Disease"***	Zoom
5:00 pm – 5:15 pm EST	Break	
5:15 pm – 5:45 pm EST	Graduate Student Talk and Q&A Session **Jordan Prahl, PhD Candidate – Van Andel Institute Graduate School** *"Global effects of Parkinson's Disease risk-SNP rs356182 at the SNCA locus"*	Zoom
6:00 pm – 7:15 pm EST	Poster Session 1 and Q&A Session I | Even-Numbered Posters	Slack

Saturday, November 7, 2020

Virtual Fair: Graduate School, Medical Schools, Professional Schools and Employers

8:00 am – 3:00 pm EST | Virtual Fair | Virtual Platform: Varies

Graduate school, medical school, professional master's program and internship/employment recruiters/representatives are available between 8:00 am – 3:00 pm EST. Start and end times for recruiters/representatives will vary. A list of recruiters/representatives, their contact information, virtual platform and their availability is provided on pages 20-23. Virtual platform links and passcodes will be emailed to registrants the day before the grad/career fair portion of the conference.

Virtual Conference

11:00 am – 11:15 am EST	Welcome | Supporting Sponsor and Poster Session Sponsor Presentations	Zoom
11:15 am – Noon EST	Undergraduate Student Talks	Zoom
	Josh Wierenga – Aquinas College *"An Elliptic Model of a Viral Capsid"*	
	Lauren Henderson – Calvin University *"The Evolution of Contact Binary Stars: Using Computational Models to Test our Evolutionary Theory"*	
	Josh Matson – Ferris State University's College of Pharmacy *"Investigation of Simultaneous EGFR and Aurora Kinase Inhibition in Non-Small Cell Lung Cancer Cells"*	
Noon – 12:15 pm EST	Break	
12:15 pm – 1:30 pm EST	Poster Session 2 and Q&A Session | Odd-Numbered Posters	Slack
1:30 pm – 2:15 pm EST	Undergraduate Student Talks	Zoom
	Nicholas Layman – Grand Valley State University *"Continuous Guessing Games with Two Secret Numbers"*	
	Kimberly Paquette – Hope College *"Links Between Religiousness and Mental and Physical Health in People with Post-Polio Syndrome"*	
	Adam Decker – Kalamazoo College *"Symmetry, Structure and Function of Icosahedral Viruses"*	
2:15 pm – 2:30 pm EST	Conclusion | Closing Remarks	Zoom

ACKNOWLEDGEMENTS

Costs for the 2020 West Michigan Regional Undergraduate Science Research Conference are underwritten by our *title sponsor* Gentex Corporation, *poster session sponsors* Ferris State University's College of Pharmacy and Grand Valley State University and *supporting sponsor* Grand Rapids Community College, as well as by the following organizing institutions: Aquinas College, Calvin University, Ferris State University – College of Pharmacy, Grand Valley State University, Hope College, Kalamazoo College, and Van Andel Institute Graduate School.

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Keith Grasman, PhD – Calvin University
Eric Nybo, PhD – Ferris State University's College of Pharmacy
Mark Staves, PhD – Grand Valley State University
Kristin Dittenhafer-Reed, PhD – Hope College
Dwight Williams, PhD – Kalamazoo College
Mary Winn, PhD – Van Andel Institute Graduate School / Van Andel Research Institute

WMRUGS HOST

Thank you to Van Andel Institute for hosting the
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WMRUGS SUPPORT STAFF

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KEYNOTE SPEAKER

Friday, November 6, 2020 | 4:15 pm – 5:00 pm EST

Zoom Link: https://zoom.us/j/99781250302?pwd=NnVRaHF5OUlsWHowaENPMU8vN2VmZz09 | Meeting ID: 997 8125 0302 | Passcode: 806527

Renã A.S. Robinson, PhD – Vanderbilt University

Associate Professor of Chemistry
Dorothy J. Wingfield Phillips Chancellor's Faculty Fellow
Department of Neurology
Vanderbilt Memory and Alzheimer's Center
Training Faculty, Vanderbilt Brain Institute
Vanderbilt Institute of Chemical Biology
NOBCChE President-Elect
For more information on Dr. Robinson, visit: https://www.vanderbilt.edu/chemistry/faculty/robinson.php

"Comprehensive Proteomics and Lipidomics Strategies to Advance Disparities Research in Alzheimer's Disease"

Abstract: Alzheimer's disease will impact an estimated 15 million individuals by 2050 in the United States, and the global incidence is increasingly growing. Certain racial/ethnic subpopulations are disproportionately affected by Alzheimer's disease. For example, African Americans and Hispanics have one and a half to three times higher incidence rates compared to nonHispanic Whites. African Americans also have higher incidence of hypertension, diabetes, high cholesterol, obesity, and cardiovascular disease in adults. These comorbidities increase risk for Alzheimer's disease and currently a molecular understanding of how this occurs does not exist [1]. We hypothesize that altered lipid metabolism is a major and central contributor to Alzheimer's disease and these noted comorbidities. Recently, we have begun to explore this hypothesis using comprehensive proteomics and lipidomics mass spectrometry-based approaches. Specifically, we have developed robust quantitative assays to measure proteins in post-mortem brain, liver, and heart tissue as well as in plasma and a range of lipids and lipid classes in plasma. Combined, these analyses provide tremendous insight into lipid metabolism and many other biological pathways that are altered in the brain and periphery of Alzheimer's disease. Furthermore, protein and lipid changes that are altered in ways that are unique to a given racial/ethnic background have been assessed. This presentation will discuss the various proteomic and lipidomics approaches established, results from pilots with small cohorts of Alzheimer's disease patients, and the implications of these findings for understanding disease pathogenesis especially as it relates to racial/ethnic disparities in Alzheimer's disease.

GRADUATE STUDENT RESEARCH TALK

Friday, November 6, 2020 | 5:15 pm – 5:45 pm EST | Zoom

Zoom Link: https://zoom.us/j/99781250302?pwd=NnVRaHF5OUlsWHowaENPMU8vN2VmZz09 | Meeting ID: 997 8125 0302 | Passcode: 806527

Jordan Prahl, PhD Candidate

Van Andel Institute Graduate School
Molecular and Cellular Biology

Research Mentor: Gerry Coetzee, PhD – Lead Investigator
Van Andel Institute
Coetzee Lab: Post-GWAS Functionality

Scientific Talk Emphasis: Genetic Diseases

"Global effects of Parkinson's Disease risk-SNP rs356182 at the SNCA locus"

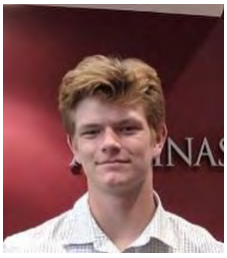
Abstract: Genome wide association studies (GWAS) have revealed 92 independent genetic risk signals associated with Parkinson's disease (PD). Most single-nucleotide polymorphisms (SNPs) identified by GWAS occur in non-exonic regions, making functional characterization difficult. Here we investigate the most significantly associated PD-risk SNP, rs356182. Its proximity to SNCA has led to the assumption that rs356182 confers risk through allele-dependent differences in alpha-synuclein expression. However, preliminary evidence suggests that the genetic enhancer encompassing rs356182 (referred to here as SNCA-ENH1) impinges on the expression of many genes across the genome, and mediates a phenotype not typically ascribed to SNCA. Together these data indicate that rs356182 may relate to PD in an unexpected way. To determine the biological mechanism(s) linking PD with rs356182 we employ LUHMES cells as a model of normal dopaminergic (DA) neurons in a mature or still developing human brain. We used CRISPR to create hemizygous cell lines, containing either the risk or protective allele. As expected, numerous genes were differentially expressed across the genome. Unexpectedly, the expression of SNCA is decreased in the presence of the risk allele compared to the protective allele. These data suggest that the previously assumed SNCA mechanism may be misunderstood or incomplete. We predict that the rs356182 risk allele increases the likelihood of PD by modulating transcription factor occupancy during a key step in DA neuron differentiation (compared to the protective allele), resulting in repression of key differentiation genes and reduction in the mature DA neuron population. Subsequent stresses leading to neuronal death are then more likely to result in Parkinsonian symptoms compared to an individual with a larger neuronal cell population.

Student Profile: https://vaigs.vai.org/students-alumni/students/jordan-prahl/
Alumnus: Grand Valley State University - Bachelor of Science, Biology and Biomedical sciences, 2013

UNDERGRADUATE STUDENT RESEARCH TALKS

Saturday, November 7, 2020 | 11:15 am – Noon EST

Zoom Link: https://zoom.us/j/99781250302?pwd=NnVRaHF5OUlsWHowaENPMU8vN2VmZz09 | Meeting ID: 997 8125 0302 | Passcode: 806527



Josh Wierenga, Aquinas College

Major(s): Biochemistry/Molecular Biology and Mathematics
Class of 2023

Research Mentor: Michael McDaniel, PhD – Professor, Department of Mathematics, Aquinas College

Scientific Talk Emphasis: Mathematics

"An Elliptic Model of a Viral Capsid"

Abstract: We construct the icosahedral sphere in elliptic geometry in order to explore the structure of some viral capsids. We prove that all sides of triangular faces are altitudes of other triangles. We interpret math properties to match biochemical facts, which points to the possibility of using math to predict biochemistry.

Lauren Henderson, Calvin University

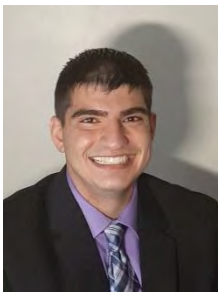
Major(s): Physics and Philosophy
Class of 2022

Research Mentor: Larry Molnar, PhD – Professor, Observatory Director – Department of Physics and Astronomy, Calvin University

Scientific Talk Emphasis: Astronomy

"The Evolution of Contact Binary Stars: Using Computational Models to Test our Evolutionary Theory"

Abstract: A contact binary star system consists of two stars orbiting so closely together that they share an outer atmosphere. Nearly 1% of stars like our sun are contact binaries, an indication that this configuration can be stable for a long time. Theorists have struggled to explain this stability, and there is not yet a consensus as to how these systems form, evolve, and ultimately die. Our goal is to test a comprehensive theory that we have developed over the past two years describing the lifetime of these systems, from how the two stars come together to how they eventually spiral into one another and explode. In this presentation, I will describe how we modeled contact binary star lifetimes using the computational package MESA. I will then compare the stellar properties from the models with observations from large galactic surveys. Overall, the results from our models agree with statistical observations with regard to a wide variety of stellar properties. The models also predict several statistical properties that we can test in the near future.



Josh Matson, Ferris State University – College of Pharmacy

Major(s): Doctor of Pharmacy
Class of 2024

Research Mentor: Felix Amissah, PhD, M.Phil, B.Pharm – Assistant Professor, Pharmaceutical Science, Ferris State University College of Pharmacy

Scientific Talk Emphasis: Cancer

"Investigation of Simultaneous EGFR and Aurora Kinase Inhibition in Non-Small Cell Lung Cancer Cells"

Abstract: Non-small cell lung cancer (NSCLC) harboring mutant KRAS presents a great challenge to treatment with EGFR inhibitors. Directly targeting the constitutively active mutant KRAS protein has not resulted in clinically useful drugs yet. Therefore, alternative approaches are required to regulate the abnormal KRAS activity for targeted treatment of EGFR-positive NSCLC. Simultaneous inhibition of EGFR and aurora kinase has been suggested to provide synergistic effects on inhibition of tumor cell proliferation and inhibition of resistance in NSCLC. This study describes the evaluation of a series of compounds design and synthesized as inhibitors of EGFR and aurora kinases. Compounds that demonstrated potent inhibition of EGFR and aurora kinase in enzymatic assays were further investigated in NSCLC cells expressing mutant KRAS and mutant EGFR. Cell viability, colony forming assays and Western blot analyses were conducted to determine effects on cell proliferation and EGFR, aurora kinase and mutant KRAS mediated downstream signaling. The results of this study will be presented and discussed.

UNDERGRADUATE STUDENT RESEARCH TALKS

Saturday, November 7, 2020 | 1:30 pm – 2:15 pm EST

Zoom Link: https://zoom.us/j/99781250302?pwd=NnVRaHF5OUlsWHowaENPMU8vN2VmZz09 | Meeting ID: 997 8125 0302 | Passcode: 806527

Nicholas Layman, Grand Valley State University

Major(s): Mathematics
Class of 2022

Research Mentor: David Clark, PhD – Associate Professor, Department of Mathematics, Grand Valley State University

Scientific Talk Emphasis: Mathematics

"Continuous Guessing Games with Two Secret Numbers"

Abstract: A guessing game is a game played between a questioner and a responder. The two players first agree upon the set, *N*, in which the game will be played as well as the number of questions, *Q*, which will be asked by the questioner. The responder first chooses two distinct numbers from *N*. The questioner then asks questions of the form "How many of your chosen numbers are in the set *S*?" where *S* is some subset of *N*, to which the responder must answer truthfully. The goal for the questioner is to determine the responder's two numbers using at most *Q* questions. We examine a continuous version of this game where *N* is the closed interval of real numbers from 0 to 1. We introduce and examine this game using a geometric approach. We also introduce a strategy which is optimal in some cases and near-optimal more generally.

Kimberly Paquette, Hope College

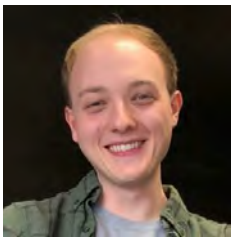
Major(s): Biology and Psychology
Class of 2021

Research Mentor: Alyssa Cheadle, PhD – Assistant Professor, Department of Psychology, Hope College

Scientific Talk Emphasis: Psychology

"Links Between Religiousness and Mental and Physical Health in People with Post-Polio Syndrome"

Abstract: Poliovirus caused worldwide pandemics in the 20th century. Currently, polio is eradicated in all but three countries. However, post-polio syndrome (PPS) affects polio survivors and is considered a secondary disability. Individuals affected by PPS experience new symptoms similar to those of polio that include muscle weakness, fatigue, joint degeneration, and pain. Additionally, they experience psychological detriments including anxiety and depression. Substantial research indicates that religiousness and spirituality are related to better health. We were interested in whether polio survivors or PPS affected individuals who are more religious/spiritual would have better health outcomes. We identified no previous studies on religiousness/spirituality and polio or PPS. Thus, the present study set out to evaluate this relationship. We conducted an analysis of data collected via interview and questionnaire from 189 polio survivors. Participants completed measures of polio history, late effects of polio (PPS symptoms), general physical functioning and health, mental health, and psychosocial resources including religiousness and spirituality at one timepoint. Aspects of religiousness and spirituality were beneficially associated with mental health, particularly depression. However, aspects of religiousness and spirituality were inversely associated with PPS symptoms and function. Previous literature on religiousness and health in healthy populations would suggest that post-polio patients who are more religious and/or spiritual would enjoy better health. This was the case for mental health in our study. However, the relationship between physical health and religiousness/spirituality was unexpected. It is possible that individuals with worsening PPS symptoms utilize coping strategies that involve religious and spiritual practices. Religiousness/spirituality might offer some help to mental health but might also index severity of physical disease state.



Adam Decker, Kalamazoo College

Major(s): Physics with a Biophysics Concentration
Class of 2021

Research Mentor: David Wilson, PhD – Herbert H. and Grace A. Dow Assistant Professor, Kalamazoo College

Scientific Talk Emphasis: Computational Biology / Bioinformatics

"Symmetry, Structure and Function of Icosahedral Viruses"

Abstract: A virus is a biological entity that hijacks a host's replication machinery in order to make copies of itself and infect other cells. We can study a virus through its two major structural components; a viral genome and a protein shell. The protein shell, also called a capsid, has the vital function of protecting the genome and consists of many copies of just a few (or even one) proteins. Spherical viruses have capsids that can be characterized by icosahedral symmetry. We can utilize symmetry analysis techniques to categorize icosahedral viruses and elucidate on how viral symmetry acts as a constraint for their evolution.

In the Wilson Lab, we use point arrays to characterize the symmetry of spherical viruses. Point arrays are a tool that describe quasicrystals but can be applied to the study of icosahedral viruses because of their similar symmetry motifs. We have also developed a method of measuring 'protein compactness' by calculating the average interparticle distance of atoms in a bounded region. This measurement shows how mass is distributed throughout a viral capsid, specifically focusing on the compactness near key features, such as protrusions or receptor binding sites. Analyzing viral capsids through their protein compactness and point array symmetry provides insight into the relationship between symmetry, structure and function. Understanding how these aspects are related may help in viral suppression through targeted antiviral therapies or even show how icosahedral viruses can be modified as capsules for drug delivery.

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AUTHOR LIST

Co-presenters, co-presenting authors, co-authors and research mentors are included with the detailed poster information on pages 13-19.

List of Principal Presenting Authors - By Poster Number				
Last Name	First Name	Poster Number	Poster Subject Area	Institution/Organization
Barnes	Charlie	47	Pharmacology	Indiana Wesleyan University
Batistela	Victor	33	Computer Science	Miami Dade College
Bouma	Claudia G.	22	Chemistry	Hope College
Brown	Evan	11	Biomedical Sciences	Indiana Wesleyan University
Brown	Katelyn	48	Pharmacology	Ferris State University
Cartwright	Alex	1	Biology	Indiana Wesleyan University
Cooper	Carolyn	42	Microbiology	Hope College
Du Laney	George	23	Chemistry	Calvin University
DuBois	Isaac	24	Chemistry	Grand Valley State University
Duimstra	Peter	38	Geography	Calvin University
Dykstra	Michelle	13	Cell and Molecular Biology	Grand Valley State University
Dykstra	Laura	34	Ecology and Evolution	Calvin University
Ellis	Jennalise	25	Chemistry	Kalamazoo College
Ensing	Jessica	40	Immunology	Grand Valley State University
Faber	Victoria	26	Chemistry	Aquinas College
Faria	Manuel	31	Computational Biology / Bioinformatics	Miami Dade College
Filippelli	Sara	2	Biology	Hope College
Flick	Autumn	45	Molecular Biotechnology	Ferris State University
Galdeen	Teegan	3	Biology	Aquinas College
Gorton	Elizabeth	27	Chemistry	Calvin University
Gunn	Jacob	14	Cell and Molecular Biology	Grand Valley State University
Heft	Megan	4	Biology	Kalamazoo College
Holkeboer	Noah	35	Ecology and Evolution	Grand Valley State University
Howe	Will	32	Computational Biology / Bioinformatics	Grand Valley State University
Johnson	Isabel	5	Biology	Calvin University
Lizzo	Rose	15	Cell and Molecular Biology	Grand Valley State University
Lueken	Mitch	49	Pharmacology	Ferris State University
Mariscal	Joseph	12	Biomedical Sciences	Grand Valley State University
May	Brendan	6	Biology	Grand Valley State University
Miller	Grace	16	Cell and Molecular Biology	Grand Valley State University
Morse	Marijane	28	Chemistry	Grand Valley State University
Moya	Gonzalo	17	Cell and Molecular Biology	Hope College
Nguyen	Jennifer Ngoc	50	Pharmacology	Ferris State University
Niergarth	Colten	43	Microbiology	Grand Valley State University
Oosterhouse	Stephanie	36	Ecology and Evolution	Calvin University
Osterbaan	Amy	53	Psychology	Hope College
Petouhoff	Annastasia	18	Cell and Molecular Biology	Hope College
Pham	Han	19	Cell and Molecular Biology	Grand Valley State University
Roberts	Kate	51	Physics	Kalamazoo College
Rovenstine	Luke	7	Biology	Taylor University
Rulison	Forest	52	Physics	Hope College
Salisbury	Eric	29	Chemistry	Hope College
Siebelink	Thomas	41	Mathematics	Aquinas College
Stevenson	Sarah	20	Cell and Molecular Biology	Hope College
Swanson	Matthew	46	Molecular Biotechnology	Ferris State University
Tippett	Ethan	44	Microbiology	Ferris State University
Topie	Lucas	8	Biology	Aquinas College
Triemstra	Abigail	37	Ecology and Evolution	Calvin University
Trumble	Nathan	30	Chemistry	Hope College
Vander Werp	Molly	21	Cell and Molecular Biology	Calvin University
Vredevoogd	Natalie	39	Geography	Calvin University
Westra	Kaitlyn	10	Bioinformatics & Biostatistics	Van Andel Research Institute
Wierenga	Josh	54	Mathematics	Aquinas College
Williams	Mariah	9	Biology	Taylor University

2020 POSTER PRESENTATIONS

Slack Channel for Posters: https://2020westmichi-erx9169.slack.com/

Friday, November 6, 2020 | 6:00 pm – 7:15 pm EST | Poster Session 1 and Q&A Session | Even-Numbered Posters

Saturday, November 7, 2020 | 12:15 pm – 1:30 pm EST | Poster Session 2 and Q&A Session | Odd-Numbered Posters

2020 POSTER PRESENTATIONS

1. Alex Cartwright, Indiana Wesleyan University **Biology**

Co-Author(s): Evan Brown, Tyler Cairncross, Charles Barnes, and Dan Jones

"Endocytosis Inhibition as a Rescue Strategy for Zoledronate-Induced Cell Death"

2. Sara Filippelli, Hope College **Biology**

Co-Presenting Author(s): Lauren Cribbs

Co-Author(s): Virginia McDonough

"Transcriptional Regulation of OLE1, the gene encoding the stearoyl-CoA desaturase in Saccharomyces cerevisiae"

3. Teegan Galdeen, Aquinas College **Biology**

Co-Author(s): Dr. Rebecca Humphrey

"Pollination mode significantly influences stigmatic pollen load: A test within two species of Thalictrum (Ranunculaceae)"

4. Megan Heft, Kalamazoo College **Biology**

Co-Author(s): Dr. Stephen Ferguson

"The Hypothalamic- Pituitary-Adrenal Axis Is Altered By Parental Absence In Nestling Tree Swallows (Tachycineta bicolor) Nestlings"

5. Isabel Johnson, Calvin University **Biology**

Co-Author(s): Rachel Baker, PhD. Amy Wilstermann, PhD.

"Elucidating Novel Protein Interactions for BCS1L"

6. Brendan May, Grand Valley State University **Biology**

Co-Author(s): Gary K Greer (mentor)

"Structural allometry of three locally-dominant deciduous tree species in West Michigan"

7. Luke Rovenstine, Taylor University **Biology**

Co-Author(s): Dr. Jessica Vanderploeg

"D. melanogaster heart as a model for cellular specification and morphogenesis studies"

8. Lucas Topie, Aquinas College **Biology**

Co-Author(s): L. Rob Peters, Ph.D.

"SYMBIONT ACQUISITION: DEVELOPMENTS IN THE BIOLOGY OF CNIDARIAN-DINOFLAGELLATE SYMBIOSIS"

9. Mariah Williams, Taylor University **Biology**

Co-Author(s): Dr. Jessica Vanderploeg

"Myosin II is required for Drosophila wing planar cell polarity"

10. Kaitlyn Westra, Van Andel Institute **Bioinformatics & Biostatistics**

Co-Author(s): Elizabeth Gibbons, BS; Jose Bras, PhD; Rita Guerreiro, PhD.

"Exome analysis of rare variants in dementia with Lewy bodies"

11. Evan Brown, Indiana Wesleyan University **Biomedical Sciences**

Co-Author(s): Alex Cartright, Tyler Cairncross, Charles Barnes, and Dan Jones

"Rescue of Human Oral Keratinocytes and Gingival Fibroblasts from Zoledronate-Induced Viability Loss: Inroads to Lessening a Bone-Cancer Drug Side Effect"

12. Joseph Mariscal, Grand Valley State University **Biomedical Sciences**

Co-Author(s): Ian Cleary, Ph.D.

"Testing the Effect of Over-expressing BRG1 in Filamentation Mutant Strains"

13. Michelle Dykstra, Grand Valley State University **Cell and Molecular Biology**

Co-Author(s): Sheila Blackman

"Functional Chaos: Solution Driven Amino Acid Migration in Intrinsically Disordered Proteins"

14. Jacob Gunn, Grand Valley State University **Cell and Molecular Biology**

Co-Author(s): David Geenen

"Gap Junctions in Stem Cells Provide an Essential Conduit for Cell-Cell Communication"

15. Rose Lizzo, Grand Valley State University **Cell and Molecular Biology**

Co-Author(s): Dr. Agnieszka Szarecka

"Modulatory Effects of Picrotoxin on the GABA(A) Receptor Ion Channel"

16. Grace Miller, Grand Valley State University **Cell and Molecular Biology**

Co-Author(s): Dr. Mark Staves

"Constructing an action spectrum for phototropism in rice roots"

17. Gonzalo Moya, Hope College **Cell and Molecular Biology**

Co-Author(s): Alicia M.Bostwick, Mackenna L. Senti, Urmimala Basu, Jiayu Shen, Smita S.Patel, Kristin E.Dittenhafer-Reed

"The Regulatory Role of Phosphorylation of Mitochondrial Transcription Factor B2 (TFB2M)"

18. Annastasia Petouhoff, Hope College **Cell and Molecular Biology**

Co-Presenting Author(s): Abigail Gift and Rosemary Mitchell

Co-Author(s): Virginia McDonough

"Regulation of OLE1 expression by cobalt and unsaturated fatty acids"

19. Han Pham, Grand Valley State University **Cell and Molecular Biology**

Co-Author(s): Dr. Margaret Dietrich

"Gene-level differential expression analysis of a Physcomitrella patens tip growth mutant using OmicsBox"

20. Sarah Stevenson, Hope College **Cell and Molecular Biology**

Co-Presenting Author(s): Natnael Belay

Co-Author(s): Sarah Dible and Virginia McDonough

"Cross-Regulation of Phospholipid and Unsaturated Fatty Acid Biosynthesis"

21. Molly Vander Werp, Calvin University **Cell and Molecular Biology**

Co-Presenting Author(s): Katherine Koning

"Modeling Intracellular Kinetics of Secretory Cargo in the Endoplasmic Reticulum"

22. Claudia G. Bouma, Hope College **Chemistry**

Co-Presenting Author(s): Ethan D. Cramer, Madeline L. Kokmeyer

Co-Author(s): Thomas D. W. Cygan, Colin D. Bradley, Nicholas S. Beers, Jason G. Gillmore

"Synthetic Efforts Toward Increasing Structural Diversity of Long-Wavelength Azo Dyes"

23. George Du Laney, Calvin University **Chemistry**

Co-Author(s): Leah Knoor, Dr. Mark Muyskens

"Computational Modeling of Coumarin Acidity"

24. Isaac DuBois, Grand Valley State University **Chemistry**

Co-Author(s): Dr. Laura Hawk

"Structural Analysis of the Sirtuin 1 NAD-dependent Lysine Deacetylase N-Terminal Domain"

25. Jennalise Ellis, Kalamazoo College **Chemistry**

Co-Author(s): Dr. Steven M. Firestine, Dr. Shiv Sharma

"Design and Synthesis of Fluorescent Isatin-based Assays for Aminoimidazole Ribonucleotide"

26. Victoria Faber, Aquinas College **Chemistry**

Co-Author(s): Dr. Jonathan Fritz

"Strategies For Regioselective Direct (Hetero)arylation"

27. Elizabeth Gorton, Calvin University **Chemistry**

Co-Presenting Author(s): Harold Gee III

Co-Author(s): Professor Herb Fynewever

"Not all Chemists are White Men"

28. Marijane Morse, Grand Valley State University **Chemistry**

Co-Presenting Author(s): Natalie Woodland

Co-Author(s): Richard L. Lord, Sudheer S. Kurup, Stanislav Groysman, Duleeka Wannipurage, and Amanda Grass

"Computational Exploration of Group Transfer Catalysts Featuring a Tethered Bis-Alkoxide Ligand"

29. Eric Salisbury, Hope College **Chemistry**

Co-Presenting Author(s): Therese A. Joffre

Co-Author(s): Erik J. Schoonover, Jacob P. VanderRoest, Luke J. Shoemaker, *Jeffrey B. Johnson

"Carbon-Carbon Bond Activation: Substitution-Decarbonylation Reactions of ortho-fluoro Pyridyl Ketones with Boronic Acids"

30. Nathan Trumble, Hope College **Chemistry**

Co-Author(s): Terrell Solberg, Elizabeth M. Sanford, Kenneth L. Brown

"An Iron Porphyrin Substituted EDOT Film Acts as a Redox Mediator to Detect Glucose Electrochemically"

31. Manuel Faria, Miami Dade College **Computational Biology / Bioinformatics**

Co-Author(s): Nelson Hidalgo

"Assessing open-source EEG Data for Motor Imagery Processing Accuracy using LDA and QDA"

32. Will Howe, Grand Valley State University **Computational Biology / Bioinformatics**

Co-Presenting Author(s): Will Howe

Co-Author(s): Agnieszka Szarecka

"In Silico Investigation of GABA(A)R-Benzodiazepine Binding Modes"

33. Victor Batistela, Miami Dade College **Computer Science**

Co-Presenting Author(s): Brian Delgado, Eduardo Ramirez, Estefano Reyes, Jose Sanchez, Manuel Carames

"Developing a Shape Recognition Program"

34. Laura Dykstra, Calvin University **Ecology and Evolution**

Co-Presenting Author(s): Drew Van Andel and Christiaan Noyes

Co-Author(s): William Miller

"Black-legged tick (Ixodes scapularis) abundance and potential ecological correlates in southwest Michigan"

35. Noah Holkeboer, Grand Valley State University **Ecology and Evolution**

Co-Author(s): Gary Greer (mentor, Department of Biology)

"Comparison of Branching Allometry between Ginkgo biloba and Several Native Michigan Trees"

36. Stephanie Oosterhouse, Calvin University **Ecology and Evolution**

Co-Presenting Author(s): Isabel Latvaitis, Abigail Triemstra

Co-Author(s): K. A. Grasman, M. Annis, C. Eakin, D. Tillitt, J. Ludwig, L. Dykstra

"Associations Between Environmental Contaminants and Vitamins A and E in Plasma of Pre-fledgling Double-crested Cormorants in the Great Lakes Including Areas of Concern"

37. Abigail Triemstra, Calvin University **Ecology and Evolution**

Co-Presenting Author(s): Stephanie Oosterhouse, Isabel Latvaitis

Co-Author(s): Keith Grasman, Laura Dykstra, Lisa Williams, Mandy Annis, Carly Eakin

"Creating Pathways to Restoration in the Great Lakes: Addressing Beneficial Use Impairments at Great Lakes AOCs"

38. Peter Duimstra, Calvin University **Geography**

Co-Author(s): Dr. Melinda Higley

"Using Ground Penetrating Radar to Investigate a Sedimentary Archive at PJ Hoffmaster State Park"

39. Natalie Vredevoogd, Calvin University **Geography**

"Building Online GIS Lesson Module Mashups: the geography of Liberia and the world"

40. Jessica Ensing, Grand Valley State University **Immunology**

Co-Author(s): Dr. Kristin Renkema, PhD

"Evaluating the microbial experience influence on anti-tumor immune response"

41. Thomas Siebelink, Aquinas College **Mathematics**

Co-Author(s): Joseph Spencer

"Predictions for Tchoukaitlon Boards that Cross at Bins 3 and 4"

42. Carolyn Cooper, Hope College **Microbiology**

Co-Author(s): Idgena DeLoach, John McMorris, Adam Slater, Sarah Brokus, Randall Wade, Aaron A. Best, Brent P. Krueger, Michael J. Pikaart

"Interactions between chemical and environmental factors and bacterial community composition in a Great Lakes watershed"

43. Colten Niergarth, Grand Valley State University **Microbiology**

Co-Author(s): Jillian Ashton, Peter Wampler, Roderick Morgan

"Installation and Monitoring of an In-Situ Filtration Well to Provide Clean Drinking Water"

44. Ethan Tippett, Ferris State University **Microbiology**

Co-Author(s): Matthew Swanson, Shannon Briggs, Mike Solomon, Schuyler Pike

"Influx Origin of Rain-Associated Increases of E. coli in Billings Lake, Manton, Michigan"

45. Autumn Flick, Ferris State University **Molecular Biotechnology**

"SARS-CoV-2 RNA Extraction Efficiency from Wastewater in 50ml Conical Tubes using Different Incubation Periods"

46. Matthew Swanson, Ferris State University **Molecular Biotechnology**

Co-Author(s): Ethan S Tippett1,2, Kennedy K Riebschleger1,2, Autumn N Flick1,2, Clifton Franklund2, Mary E Zimmer2, Schuyler T Pike1,2

"RT-qPCR Analysis for SARS-CoV-2 in Campus Wastewater as a Preventative Solution"

47. Charlie Barnes, Indiana Wesleyan University **Pharmacology**

Co-Author(s): Tyler Cairncross, Alex Cartwright, Evan Brown, Jacob Kirby, Jessica Binkley, Abigail Conrad, Morgan Jessup, Spencer Roose, Makayla Standfest, and Dan Jones

"Dose Optimization of Potential Topical Compounds for Treating Bisphosphonate-Related Osteonecrosis of the Jaw"

48. Katelyn Brown, Ferris State University **Pharmacology**

Co-Presenting Author(s): Katelyn V. Brown [1], Kennedy Riebschleger [1], Nina Gorgijevska [1]

Co-Author(s): Sky T. Pike [2], and S. Eric Nybo [1,*]

"BioBricks® metabolic engineering of elloramycin and tetracenomycins"

49. Mitch Lueken, Ferris State University **Pharmacology**

Co-Presenting Author(s): Mitch Luekin [†,1], Jennifer Nguyen [†,1], Kennedy Riebschleger [†,1], Shannon Hunt [1]

Co-Author(s): Sky T. Pike [2], and S. Eric Nybo [1,*]

"BIOPOLYMER®: BIOBricks POLYketide Metabolic EngineeRing of minimal polyketide synthases"

50. Jennifer Ngoc Nguyen, Ferris State University **Pharmacology**

Co-Presenting Author(s): Jennifer Nguyen [†,1], Kennedy Riebschleger [†,1], Katelyn V. Brown [1]

Co-Author(s): S. Eric Nybo [1,*]

"Multiplexed BioBricks® metabolic engineering of central carbon metabolism in the actinorhodin pathway"

51. Kate Roberts, Kalamazoo College **Physics**

Co-Author(s): Michelle Kuchera, Raghu Ramanujan, Yassid Ayyad, Marco Cortesi, Morten Hjorth-Jensen

"Machine learning for improved resolution and fast predictions in a parallel-plate avalanche counter with optical readout (O-PPAC)"

52. Forest Rulison, Hope College **Physics**

"Effects of Electrosynthesis Duration on Surface Structure and Storage Capabilities of Prussian Blue Analogue Films"

53. Amy Osterbaan, Hope College **Psychology**

Co-Author(s): Dr. Alyssa Cheadle, Dr. Daryl Van Tongeren

"Do Health Behaviors Vary Depending on Religious Affiliation History? An Investigation of the Religious Residue Effect"

54. Josh Wierenga, Aquinas College **Mathematics**

"An Elliptic Model of a Viral Capsid"

INTERNSHIP AND EMPLOYMENT RECRUITER/REPRESENTATIVE CONTACT INFORMATION

GENTEX CORPORATION
WEBSITE: http://www.gentex.com/

GENTEX CORPORATION

Gentex Corporation – Corporate Headquarters
600 North Centennial Street
Zeeland, MI 49464

Daniel Quintanilla, Talent Acquisition Manager
Email: dquintanilla@gentex.com
Telephone: 616-772-1800 ext. 5127

Kurtis Geerlings, Research Manager
Email: hr@gentex.com
Telephone: 616-772-1800

Gentex Corporation recruiters / representatives will be available virtually via MS Teams
*Recruiters / Representatives: **Daniel Quintanilla** will be available from 11:00 am – 2:00 pm EST*

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RESEARCH INTERNSHIPS: http://vaigs.vai.org/undergrad-research/internship-opps/
GUEST STUDENT OPPORTUNITIES: http://vaigs.vai.org/undergrad-research/

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Van Andel Institute
333 Bostwick Ave.NE
Grand Rapids, MI 49503

Undergraduate & Internship Program Committee
Email: undergrad@vai.edu
Telephone: 616-234-5581

Van Andel Institute recruiters/representatives will be available virtually via Zoom
*Recruiters / Representatives: **Michelle Love** will be available from 8:00 am – 10:00 am EST | **Ariana Kupai** will be available from 10:00 am – Noon EST*
***Jennifer Wloszek** and **Kaitlyn Westra** will be available from Noon – 3:00 pm EST*

GRADUATE SCHOOL, MEDICAL SCHOOL AND PROFESSIONAL SCHOOL RECRUITER CONTACT INFORMATION

FERRIS STATE UNIVERSITY – COLLEGE OF PHARMACY
WEBSITE: https://www.ferris.edu/pharmacy/

College of Pharmacy
Ferris State University | Pharmacy Building
220 Ferris Drive
Big Rapids, MI 49307

Dr. Stephen Durst, Dean – College of Pharmacy, Dean's Office
Email: dursts@ferris.edu
Telephone: 231-591-2254

Dr. Thomas Dowling, Assistant Dean and Director of Research and Sponsored Programs
Email: thomasdowling@ferris.edu
Telephone: 616-643-1137

Tara M. Lee, Director of Admissions
Email: taralee@ferris.edu
Telephone: 231-591-2249

Ferris State University – College of Pharmacy recruiters/representatives will be available virtually via Zoom
Recruiters / Representatives: Will be available from 8:00 am – 3:00 pm EST

GRAND VALLEY STATE UNIVERSITY
WEBSITE: http://www.gvsu.edu/

Admissions
Grand Valley State University – The Graduate School
314C Richard M. DeVos Center
401 W. Fulton Street
Grand Rapids, MI 49504

Office of Graduate Studies
Website: https://www.gvsu.edu/gs/masters-and-doctoral-degree-programs-9.htm

Rachel Van Den Broek, MA, MBL – Recruiter, Graduate Programs
Email: vandenr1@gvsu.edu
Telephone: 616-331-7067 | Cell: 712-395-3209

Padnos College of Engineering and Computing
Grand Valley State University – Professional Science Master's (PSM)
Kennedy Hall of Engineering
301 W. Fulton Street
Grand Rapids, MI 49504

Professional Science Master's (PSM)
Website: http://www.gvsu.edu/psm/

Anirudh Chowdhary, PhD, Professional Science Master's Coordinator
Email: chowdhan@gvsu.edu
Telephone: 616-331-6297

Grand Valley State University recruiters/representatives will be available virtually via Zoom
Recruiters / Representatives: **Rachel Van Den Broek** and **Anirudh Chowdhary** will be available from 8:00 am – 3:00 pm EST

INDIANA UNIVERSITY SCHOOL OF MEDICINE
WEBSITE: go.iu.edu/IBMG

The Indiana BioMedical Gateway (IBMG) Program
Indiana University School of Medicine – Graduate Division
635 North Barnhill Drive / Room 207
Indianapolis, IN 46202

Brandy S. Wood, Assistant Director, IBMG Program for PhD Study
Email: biomed@iupui.edu
Telephone: 317-274-8719

Indiana University School of Medicine recruiters/representatives will be available virtually via Zoom
Recruiters / Representatives: **Brandy S. Wood** will be available from 8:00 am – 3:00 pm EST

MANCHESTER UNIVERSITY – COLLEGE OF PHARMACY, NATURAL & HEALTH SCIENCES
WEBSITE: www.manchester.edu

College of Pharmacy, Natural & Health Sciences
Manchester University
10627 Diebold Road
Fort Wayne, IN 46845

Greg Hetrick, Assistant Dean of Enrollment Management and Community Engagement
Email: pharmacy@manchester.edu
Telephone: 260-470-2703

Julie Cogley-Pifko, Assistant Director of Admissions and Enrollment Management
Email: jacogley@manchester.edu
Telephone: 260-470-2678

McKenzie Gould, Graduate Admissions Advisor
Email: MEGould@manchester.edu
Telephone: 260-470-2709

Manchester University – College of Pharmacy, Natural & Health Sciences recruiters/representatives will be virtually via Zoom
Recruiter / Representative Availability: ***Greg Hetrick, Julie Cogley-Pifko*** *and* ***McKenzie Gould*** *will be available from 8:00 am – 3:00 pm EST*

PURDUE UNIVERSITY – INTERDISCIPLINARY LIFE SCIENCE PROGRAM (PULSe)
WEBSITE: https://www.purdue.edu/gradschool/pulse/index.html

Interdisciplinary Life Science Program (PULSe)
Purdue University
155 S. Grant Street, B40
West Lafayette, IN 47907

Lindsey Springer, Senior Graduate Program Specialist, PULSe
Email: pulse@purdue.edu
Telephone: 765-496-9667

Purdue University – Interdisciplinary Life Science Program (PULSe) recruiters / representatives will be available virtually via Zoom
Recruiter / Representative Availability: ***Lindsey Springer*** *will be available from 8:00 am – Noon EST*

UNIVERSITY OF MICHIGAN – DEPARTMENT OF MOLECULAR & INTEGRATIVE PHYSIOLOGY
WEBSITE: https://medicine.umich.edu/dept/molecular-integrative-physiology

Department of Molecular and Integrative Physiology
University of Michigan
2800 Plymouth Road, NCRC B26-207S
Ann Arbor, MI 48109

Daniel E. Michele, Professor and Graduate Program Director
Email: dmichele@umich.edu
Telephone: 734-764-5738

University of Michigan – Department of Molecular & Integrative Physiology recruiters / representatives will be available virtually via Zoom
*Recruiter / Representative Availability: **Daniel E. Michele** will be available from 8:00 am – 3:00 pm EST*

VAN ANDEL INSTITUTE GRADUATE SCHOOL
WEBSITE: http://vaigs.vai.org/

Van Andel Institute Graduate School
333 Bostwick Avenue, NE
Grand Rapids, MI 49503

Christy Mayo, Director of Enrollment and Records
Email: registrar@vai.edu
Telephone: 616-234-5708

Van Andel Institute Graduate School recruiters/representatives will be available virtually via Zoom
*Recruiter / Representative Availability: **Christy Mayo** will be available from 10:00 am – 2:00 pm EST*

WESTERN MICHIGAN UNIVERSITY – GRADUATE COLLEGE
WEBSITE: https://wmich.edu/grad

Graduate College
Western Michigan University
1903 W. Michigan Avenue
Kalamazoo, MI 49008

Tony Dennis, Director of Graduate Student Recruitment
Email: tony.dennis@wmich.edu
Telephone: 269-387-8212

Western Michigan University Graduate College recruiters/representatives will be available from 8:00 am – 3:00 pm virtually via Zoom
*Recruiter / Representative Availability: **Tony Dennis** available from 8:00 am – 3:00 pm EST*

VOLUNTEER OPPORTUNITIES

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WEBSITE: https://purplecommunity.vai.org/

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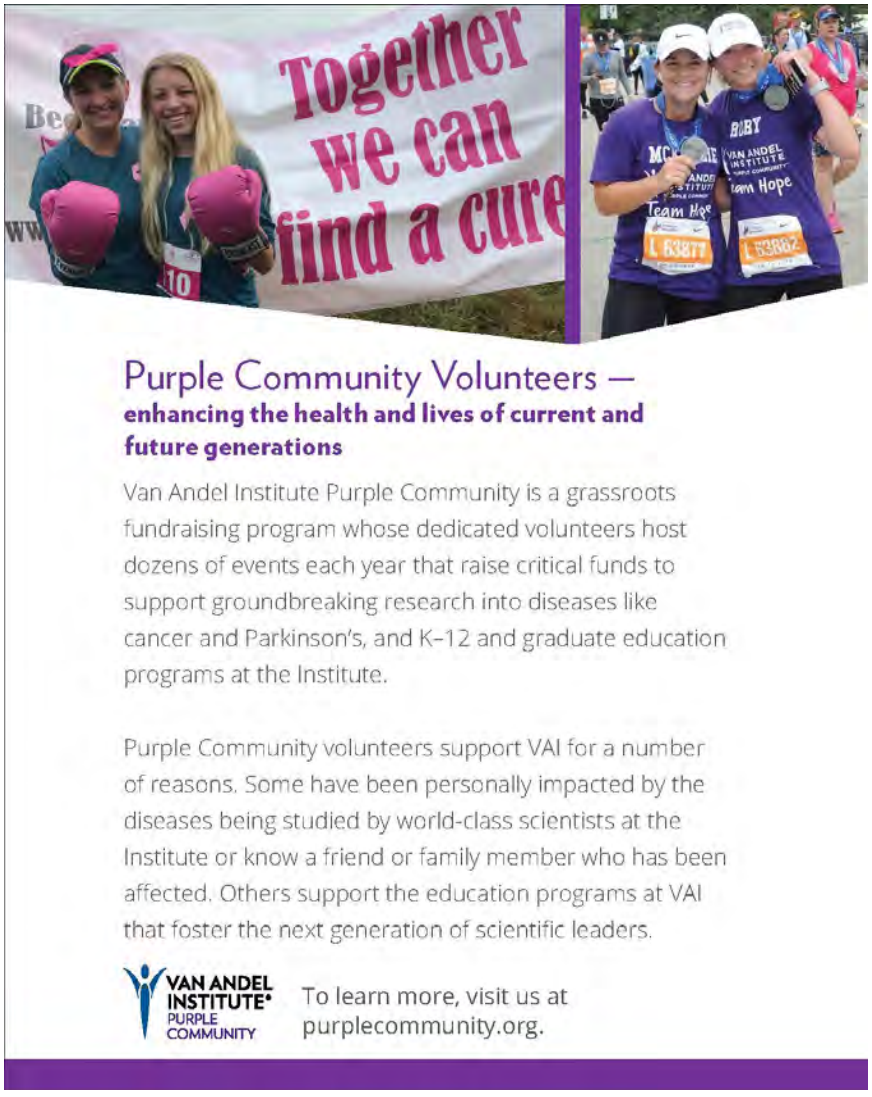
Van Andel Institute
333 Bostwick Avenue, NE
Grand Rapids, MI 49503



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