

**6th ANNUAL
WEST MICHIGAN REGIONAL UNDERGRADUATE SCIENCE (WMRUGS) RESEARCH
CONFERENCE
SATURDAY, NOVEMBER 17, 2012**

KEYNOTE SPEAKER



Elizabeth H. Simmons, Ph.D.

**Professor, Physics and Astronomy
Dean of Lyman Briggs College
Michigan State University**

“From Asteroid Orbits to the Higgs Boson: Why your Undergraduate Research Experience is so Important”

Any individual "wears many hats" over a lifetime. No matter which hat I'm wearing at a given moment, undergraduate research appears tremendously important to higher education and to the future of the United States. As a dean, I view undergraduate research as a crucial tool for broadening participation in STEM (science, technology, engineering, and mathematics) disciplines and an important way to meet national needs for more STEM professionals. As a faculty member who supervises undergraduate research projects (and the parent of an undergraduate researcher), I see first-hand the unique impact on individual students' academic pathways. As a former undergraduate researcher and present-day physicist, I feel the continuity of the experience from student intern to principle investigator. In this talk, I'll discuss these varied perspectives on undergraduate research, give a quick overview of my own research in particle physics, and say a few words about how to make the most of your own research experience today and going forward.

ABSTRACTS OF FACULTY RESEARCH TALKS



Greg Fraley, Ph.D., Associate Professor, Department of Biology, Hope College

“The Neuroprotective Effects of a Plant Hormone, Resveratrol: Implications for End-Stage Parkinson's Disease Therapy”

Brain-implantable electrodes such as those used in deep brain stimulation (DBS) have a promising future in end-stage Parkinson's disease therapy. However, there is considerable injury when electrodes penetrate brain tissue. For instance, broken blood vessels and glial scar formation may impede continual DBS or electrical recording from specific neurons. To begin addressing this key safety issue, we tested the therapeutic potential of resveratrol in reducing brain trauma caused by DBS-like surgery. Microinfusion of resveratrol (10 μ M) directly applied to the sub-thalamic nucleus (STN) of the rat brain significantly minimized the formation of astrocytic gliosis in response to a 27 G precision-glide cannula implant. The therapeutic effects of resveratrol extended to the “kill zone”, a boundary zone of about 100- μ m comprising the cannula implant and surrounding neurons. We also found that resveratrol not only provided almost complete protection from mechanical injury to the brain, but that it also prevented undesirable motor deficits often seen in animals with lesions to the STN. Lastly, continuous infusion of resveratrol over a 4 week-period led to the inhibition of pro-apoptotic, neurodegenerative and cell division cycle genes that may be associated with a reduction in astrocytic gliosis and glial scar formation within the STN. Taken together, these data suggest that application of resveratrol to the brain is an effective adjunct surgical procedure for minimizing acute neuronal injury when electrodes are implanted directly into the STN.

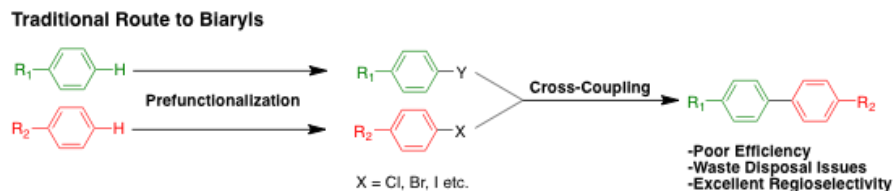
ABSTRACTS OF FACULTY RESEARCH TALKS



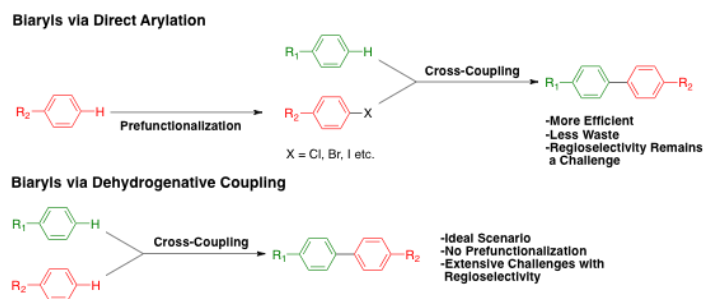
Jonathan Fritz, Ph.D., Assistant Professor, Department of Chemistry, Aquinas College

“Regioselectivity of Direct Arylation Reactions”

Biaryl and heterobiaryl scaffolds are present in a multitude of pharmaceuticals. Cross-coupling reactions such as Suzuki, Stille, and Negishi couplings, which can be used to generate biaryls, are now used ubiquitously in drug discovery and organic synthesis. However, this traditional strategy toward achieving this important class of compounds requires prefunctionalization of the arene coupling partners. This creates waste and necessitates the synthesis of the coupling partners which itself can be challenging.



With the goals of improved efficiency and greener chemistry in view, several groups are exploring methods to obviate the prefunctionalization steps for either one or both coupling partners. Such strategies for synthesis of biaryls are often termed direct arylation and dehydrogenative coupling respectively.



While in principle direct arylations and dehydrogenative arylations offer improved routes to biaryl and heterobiaryl compounds, in practice they are typically plagued by a variety of side reactions that preclude their general use. One of the main challenges facing this class of reactions is that of regioselectivity. Most arenes have several hydrogens which may react to form products. One of our goals is to increase the understanding of factors affecting regioselectivity in direct arylations. In particular, we are interested in catalyst structure activity relationships: how changing either the steric or electronic properties of the catalyst's ligands affects the regioselectivity of a given direct arylation reaction.

ABSTRACTS OF FACULTY RESEARCH TALKS



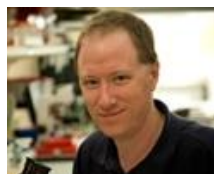
Stanley Haan, Ph.D., Dean for the Natural Sciences and Mathematics; Professor, Department of Physics, Calvin College

“Computer Modeling of Double Ionization of Atoms by High-Intensity Near-Infrared Lasers”

It has been accepted that “recollision” is the primary process by which near-infrared high-intensity lasers cause double ionization in atoms: the laser ionizes one electron and pushes it away from the core, but then the laser field switches direction and propels the electron back to the core, where recollision transfers energy to the other electron [1]. Our group has been doing both quantum mechanical and classical computer modeling of the process, helping to understand the very rich dynamics how recollision leads to double ionization. Sometimes both electrons are free immediately after the collision, but more often than not at least one of the electrons remains loosely bound to the nucleus for a portion of a laser cycle after recollision [2]. This talk will consider how the delay between recollision and final double ionization influences experimentally measurable quantities. The talk will also discuss reasons that classical mechanics works so well in describing the double ionization process.

[1] K.J. Schafer *et al.*, Phys. Rev. Lett. **70**, 1599 (1993); P.B. Corkum, *ibid.* **71**, 1994 (1993).

[2] S.L. Haan *et al.*, Phys. Rev. Lett. **97**, 103008 (2006).



Bart Williams, Ph.D., Associate Professor and Director, Center for Skeletal Disease Research and Head, Laboratory of Cell Signaling & Carcinogenesis, Van Andel Research Institute

“Genetically Engineered Mouse Models to Study Bone Disease”

Wnt signaling initiated when one of the 19 Wnt ligands binds to a receptor complex that includes a member of the Frizzled family of seven transmembrane proteins and either Lrp5 or Lrp6 (Low-density lipoprotein related proteins 5 and 6). This activates a pathway that eventually results in the stabilization of B-catenin. B-catenin then translocates to the nucleus where it activates target gene transcription. Proper regulation of Wnt signaling plays a central role in development and alterations in this pathway are associated with several human diseases. For example, loss of function in Lrp5 causes Osteoporosis Pseudoglioma, a syndrome in which patients develop extremely low bone mass at very young ages. To gain insight into the mechanisms underlying the function of Lrp5 in establishing and maintaining normal bone mass, we have created several genetically engineered mouse models in which Lrp5 function is altered in the osteoblast, the cell type that secretes bone matrix. Characterization of these mice demonstrated that Lrp5 and the related protein Lrp6 function together to regulate bone acquisition and maintenance. Current work is focused on assessing how the Lrp5 and Lrp6 receptors are activated by Wnt ligands within osteoblasts and on characterizing the downstream components of this pathway that mediate the functions of Lrp5 and Lrp6 in this cell type.

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2012 POSTER PRESENTATIONS**

AUTHORS LIST

**Pages 5-8 includes a list of principal presenting authors by last name
(alphabetical order)**

Last Name	First Name	Poster Number	Institution	Field of Study
Abbott	Josh	14	Kalamazoo College	Biochemistry
Alabi	Ola-Oluwakiti	21	Calvin College	Biochemistry
Alsum	Shaun	168	Calvin College	Physics
Baldwin	Chase	102	Grand Valley State University	Ecology and Evolution
Bauer	Lauren	132	Aquinas College	Microbiology
Belmonte	Paul	89	Grand Valley State University	Chemistry
Bender	Lauren	170	Calvin College	Psychology
Betz	Jordyn	79	Grand Valley State University	Chemistry
Billquist	Elizabeth	43	Hope College	Cell and Molecular Biology / Genetics
Bolles	Amanda	2	Kalamazoo College	Biochemistry
Bootsma	Andrea	63	Calvin College	Chemistry
Bour	James	75	Hope College	Chemistry
Bouza	Alexandra	62	Grand Valley State University	Chemistry
Boykov	Yelena	60	Calvin College	Cell and Molecular Biology / Genetics
Bradley	Mary	56	Hope College	Cell and Molecular Biology / Genetics
Bradley	Patrick	59	Ferris State University	Cell and Molecular Biology / Genetics
Braun	Melissa	118	Calvin College	Geology
Bresnhan	Kelly	81	Kalamazoo College	Chemistry
Bretous	Alain	173	Wayne State University	Biological Sciences, Biomolecules
Briggs II	Erran	70	Kalamazoo College	Chemistry-AM
Brogan	Emily	46	Alma College	Cell and Molecular Biology / Genetics
Brown, PhD	Tami	152	Grand Valley State University	Organism Biology / Physiology
Brown, PhD	Hugh	171	Pierce Cedar Creek Institute	Science Education
Burckhardt	Rachel	134	Alma College	Microbiology
Bussis	Kyle	163	Calvin College	Physics
Campbell	Chelsea	143	Hope College	Organism Biology / Physiology
Capodilupo	John	138	Grand Valley State University	Neuroscience
Carlson	Graham	72	Hope College	Chemistry
Carter	Margeaux	164	Calvin College	Physics
Chan	Erica	32	Calvin College	Biophysics
Chawdhary	Anirudh	36	Grand Valley State University	Cell and Molecular Biology / Genetics
Clements	Lauren	34	Ferris State University	Biotechnology
Closs	Justin	100	Alma College	Computer Science
Colton	Sarah	151	Hope College	Organism Biology / Physiology
Cox	Eric	47	Hope College	Cell and Molecular Biology / Genetics
Cramer	Cassandra	9	Hope College	Biochemistry

Last Name	First Name	Poster Number	Institution	Field of Study
Darusz	Jessica	147	Calvin College	Organism Biology / Physiology
Davis	Noah	121	Aquinas College	Mathematics
Davis	Ariangela	125	Calvin College	Microbiology
De Vries	Brett	64	Calvin College	Chemistry
DeGroff	Austin	127	Calvin College	Microbiology
DeGroot	Elizabeth	11	Calvin College	Biochemistry
Dekoski	Danielle	104	Grand Valley State University	Ecology and Evolution
Dennis	Joseph	80	Hope College	Chemistry
Divakaran	Anand	5	Calvin College	Biochemistry
Docter	Brianne	8	Grand Valley State University	Biochemistry
Dolehanty	Andrew	137	Hope College	Neuroscience
Dugue	Carline	67	Kalamazoo College	Chemistry
Durston	Mary	57	Grand Valley State University	Cell and Molecular Biology / Genetics
Dutkiewicz	Abigail	35	Ferris State University	Cell and Molecular Biology / Genetics
Dykstra	Heidi	48	Calvin College	Cell and Molecular Biology / Genetics
Dykstra	Michael	165	Grand Valley State University	Physics
Edewaard	Eric	29	Van Andel Research Institute	Biology
Ellis	Samantha	91	Grand Valley State University	Chemistry
Engerson	Andrea	123	Grand Valley State University	Microbiology
Finn	Thomas	93	Aquinas College	Chemistry
Fordor	Sarah	92	Hope College	Chemistry
Franks	Jessica	108	Grand Valley State University	Ecology and Evolution
Garlock	Kelsey	116	Ferris State University	Forensic Biology
Gasparotto	Anthony	38	Hope College	Cell and Molecular Biology / Genetics
Gilbert	Neil	112	Calvin College	Ecology and Evolution
Golz	Emily	69	Calvin College	Chemistry
Goodman	Danielle	41	Hope College	Cell and Molecular Biology / Genetics
Grant	Andrew	1	Alma College	Athletic Training
Grit	Jamie	49	Hope College	Cell and Molecular Biology / Genetics
Gunnink	Stephen	26	Calvin College	Biochemistry
Haas	Rachel	140	Hope College	Neuroscience
Hammond	Brandy	128	Calvin College	Microbiology
Harder	Matthew	58	Hope College	Cell and Molecular Biology / Genetics
Harkema	Nathan	166	Calvin College	Physics
Hartwig	Daniella	40	Calvin College	Cell and Molecular Biology / Genetics
Haveman	Matthew	85	Calvin College	Chemistry
Hayes	David	10	Hope College	Biochemistry
Healy	Stephen	114	Calvin College	Economics
Herrema	LaNora	83	Grand Valley State University	Chemistry
Hess	Andrew	155	Calvin College	Physics
Hibma	Elizabeth	120	Calvin College	Mathematics
Hicks	Michael	20	Kalamazoo College	Biochemistry
Hidlebaugh	Elizabeth	44	Hope College	Cell and Molecular Biology / Genetics
Holder	Cameron	66	Hope College	Chemistry
Hoogewerf	Arlene	126	Calvin College	Microbiology
Hundley	Zachary	28	Grand Valley State University	Biochemistry

Last Name	First Name	Poster Number	Institution	Field of Study
Irvin	Michelle	88	Hope College	Chemistry
Jackman	Brianna	7	Grand Valley State University	Biochemistry
Jeries	Brooke	156	Hope College	Physics
Kaitanyk	Kipchumba	16	Grand Valley State University	Biochemistry
Kelsey	Justin	130	Muskegon Community College	Microbiology
Kennedy	Jenna	50	Calvin College	Cell and Molecular Biology / Genetics
Kim	Yeon	122	Central Michigan University	Mathematics
Koboski	Kyla	162	Hope College	Physics
Konyndyk	Jillian	51	Calvin College	Cell and Molecular Biology / Genetics
Kuiper	Benjamin	6	Calvin College	Biochemistry
LaFleur	James	97	Grand Valley State University	Computational Biology / Bioinformatics
LaGrand	John	76	Calvin College	Chemistry
Lang	Sara	25	Hope College	Biochemistry
Langeland	Geneva	105	Calvin College	Ecology and Evolution
Langeland	Monica	148	Calvin College	Organism Biology / Physiology
Lapen	Jacob	159	Calvin College	Physics
Lemke	Lacey	79	Grand Valley State University	Chemistry
Lin	Jonathan	53	Calvin College	Cell and Molecular Biology / Genetics
Lindberg	Abigail	136	Hope College	Neuroscience
Livezey	Mara	17	Kalamazoo College	Biochemistry
Lofthus	Shelby	27	Calvin College	Biochemistry-PM
Lubben	Michael	86	Calvin College	Chemistry
Luyk	Clayton	103	Calvin College	Ecology and Evolution
Manninen	Matthew	19	Ferris State University	Biochemistry
Marmion	Richard	30	Grand Valley State University	Biology
Martinie	Ryan	24	Calvin College	Biochemistry
Maryanski	Danielle	42	Grand Valley State University	Cell and Molecular Biology / Genetics
Mc Rae	Meagan	148	Calvin College	Organism Biology / Physiology
McLellan	Lisa	133	Hope College	Microbiology
Meier	Robert	167	Grand Valley State University	Physics
Mitchell	Joshua	15	Grand Valley State University	Biochemistry
Mitchell	Tyler	135	Cornerstone University	Microbiology
Morris	John	119	Calvin College	Immunology
Muyskens	John	99	Calvin College	Computer Science
O'Donnell	Janine	146	Aquinas College	Organism Biology / Physiology
Olson	Kevin	82	Hope College	Chemistry
Oster	Gwen	103	Calvin College	Ecology and Evolution
Parker	Sabrina	141	Central Michigan University	Neuroscience
Patmore	Emma	158	Alma College	Physics
Perry	Kelsey	54	Grand Valley State University	Cell and Molecular Biology / Genetics
Peruzzi	Michael	87	Grand Valley State University	Chemistry
Peshl	Jeremy	160	Grand Valley State University	Physics
Plantinga	Anna	37	Calvin College	Cell and Molecular Biology / Genetics
Ploch	Catilin	157	Hope College	Physics
Porter	Amanda	3	Hope College	Biochemistry
Praamsma	Riemer	22	Calvin College	Biochemistry
Preseley	Jordan	33	Alma College	Biotechnology

Last Name	First Name	Poster Number	Institution	Field of Study
Reese	Caleb	115	Calvin College	Engineering
Rice	Meredith	149	Hope College	Organism Biology / Physiology
Roemer	Alex	95	Van Andel Research Institute	Computational Biology / Bioinformatics
Rowe	Logan	169	Western Michigan University	Plant Molecular Biology/Phylogenetics
Rugen	Evan	71	Hope College	Chemistry
Salazar	Clarence	154	Ferris State University	Other
Sartain	Hope	73	Grand Valley State University	Chemistry
Scheid	Jacob	12	Grand Valley State University	Biochemistry
Schleh	Elizabeth	45	Calvin College	Cell and Molecular Biology / Genetics
Schuiling	Amanda	96	Hope College	Computational Biology / Bioinformatics
Selles	Owen	117	Calvin College	Geography
Sheikh	Elaine	144	Grand Rapids Community College	Organism Biology / Physiology
Sieck	Brennan	101	Hope College	Ecology and Evolution
Sienkowski	Leah	111	Calvin College	Ecology and Evolution
Sinclair	Josiah	161	Calvin College	Physics
Slopsema	Julia	31	Hope College	Biomedical Engineering
Smith	Mallory	84	Hope College	Chemistry
Stoddard	Alex	142	Calvin College	Organism Biology / Physiology
Stone	Hannah	145	Alma College	Organism Biology / Physiology
Stoyka	Lindsay	55	Grand Valley State University	Cell and Molecular Biology / Genetics
Streelman	Abigail	94	Calvin College	Computational Biology / Bioinformatics
Stretton	Christopher	129	Grand Valley State University	Microbiology
Strikwerda	John	77	Calvin College	Chemistry
Sung	Jin	13	Calvin College	Biochemistry
Sweda	Nicholas	90	Kalamazoo College	Chemistry-AM
Tenney	Jenna	51	Calvin College	Cell and Molecular Biology / Genetics
Thoe	Jessica	52	Grand Valley State University	Cell and Molecular Biology / Genetics
Turkus	Jonathan	109	Hope College	Ecology and Evolution
Uitvlugt	Caleb	65	Calvin College	Chemistry
Urech	Alexander	61	Western Michigan University	Chemistry
Valesano	Andrew	124	Hope College	Microbiology
Van Doornik	Tina	113	Michigan State University	Ecology and Evolution
Van Winkle	Margaret	18	Calvin College	Biochemistry
VandeHaar	Peter	98	Calvin College	Computational Biology / Bioinformatics
Vander Stel	Holly	106	Hope College	Ecology and Evolution
Vandezande	Jonathon	78	Calvin College	Chemistry
Vaughan	Robert	23	Grand Valley State University	Biochemistry
Veldkamp	Kelsey	131	Calvin College	Microbiology
Veldkamp	Simon	172	Calvin College	Science Education
Waalkes	William	153	Grand Valley State University	Organism Biology / Physiology
Wallace	Chelsea	39	Kalamazoo College	Cell and Molecular Biology / Genetics
Wierenga	David	68	Calvin College	Chemistry
Wieringa	Jamin	107	Hope College	Ecology and Evolution
Williams	Jacqueline	74	Grand Valley State University	Chemistry
Witte	Amanda	4	Calvin College	Biochemistry
Wong	Jonathan	139	Calvin College	Neuroscience
Zemaitis	Kristen	110	Grand Valley State University	Ecology and Evolution
Zucker	Noah	150	Grand Valley State University	Organism Biology / Physiology

2012 POSTER PRESENTATIONS

Pages 9-22 include a list of principal presenting authors and the titles of their presentations. This list is in alpha order by major and then institution.

1. Andrew Grant, Athletic Training Alma College
(Co-Authors: Marta Perez and John Davis)

"Effect of Altitude of Residence on the Cardiovascular Responses to Dynamic and Isometric Exercise at 4900 meters"

2. Amanda Bolles, Biochemistry Kalamazoo College
(Co-Authors: Erran D. Briggs, Mara R. Livezey, Leslie D. Nagy, Laura Lowe Furge)

"Metoclopramide is not a Mechanism-based Inactivator of CYP2D6"

3. Amanda Porter, Biochemistry Hope College
(Co-Authors: Amanda L. Porter, Sarah Colton, Chelsea Campbell, Elizabeth Gerometta, Rachel Haas, Abigail Lindberg, Sara Gallemore, Advisers: Drs. Gregory S. Fraley, Aaron A. Best, & Susan M. Fraley)

"Gut bacterial ecology of developing Pekin ducks in the food industry"

4. Amanda Witte, Biochemistry Calvin College
(Co-Authors: Abigail Leistra and Kumar Sinniah)

"An Atomic Force Microscopy Study of Riboflavin Receptor Targeting Nanoparticles"

5. Anand Divakaran, Biochemistry Calvin College
(Co-Authors: Drew Roth, Elizabeth G. Porter, Ryan Martinie, Nathanael M. Myton, Taylor Hegg, David E. Benson)

"Detection Strategies for Tyrosine-Cysteine Crosslinks"

6. Benjamin Kuiper, Biochemistry Calvin College
(Co-Authors: Ola Alabi, Stephen Gunnink, Dr. Larry Louters)

"Acute Effects of Osthole on Glucose Transporter 1"

7. Brianna Jackman, Biochemistry Grand Valley State University
(Co-Authors: Garrett M. MacLean, Justine M. Travis, Cory M. DiCarlo)

"Reduction Potential Shift in Cytochrome c Peroxidase Mutants D79K and D267K"

8. Brianne Docter, Biochemistry Grand Valley State University
(Co-Authors: Mujahid Anwar, David Leonard, Rachel Powers, and Bradley Wallar)

"Probing the Binding Site in the Antibiotic Resistance Enzyme, AmpC beta-lactamase"

9. Cassondra Cramer, Biochemistry **Hope College**

“Real Time Analysis of System xc-”

10. David Hayes, Biochemistry **Hope College**

(Co-Authors: Maria Burnatowski-Hledin and Vicki Isola)

“The Production of Monoclonal Antibodies to VACM-1/Cullin 5.”

11. Elizabeth DeGroot, Biochemistry **Calvin College**

“Investigating Novel Splice Variants in Zebrafish”

12. Jacob Z. Scheid, Biochemistry **Grand Valley State University**

(Co-Authors: Neil V. Klinger, Jacob Z. Scheid, Harvey J. Nikkel, Rachel A. Powers, and David A. Leonard)

“Four hydrophobic residues control substrate selectivity in the OXA-24 carbapenemase”

13. Jin Sung, Biochemistry **Calvin College**

(Co-Authors: Allie Bogner and Chad Tatko)

“Metal Binding Catechols”

14. Josh Abbott, Biochemistry **Kalamazoo College**

“Cyclophosphamide Metabolism by Cytochrome P450 2B6”

15. Joshua Mitchell, Biochemistry **Grand Valley State University**

(Co-Authors: Neil V. Klinger, Kip-Chumba Kaitany, Robert A. Bonomo, Rachel A. Powers and David A. Leonard)

“A Pro>Ser mutation augments advanced generation cephalosporinase activity in both the OXA-23 and OXA-24 subfamilies”

16. Kipchumba Kaitanyk, Biochemistry **Grand Valley State University**

(Co-Authors: Neil V. Klinger, Maddison E. Ramey, Robert A. Bonomo, Rachel A. Powers and David A. Leonard)

“A Class D β -lactamase Clinical Variant with Activity Against Carbapenems, Ceftazidime and Aztreonam”

17. Mara Livezey, Biochemistry **Kalamazoo College**

(Co-Authors: Mara R. Livezey, Leslie D. Nagy, Laura E. Diffenderfer, Evan J. Arthur, David J. Hsi, Laura Lowe Furge)

“Molecular analysis and modeling of inactivation of CYP2D6 by four mechanism-based inhibitors”

18. Margaret Van Winkle, Biochemistry **Calvin College**

(Co-Authors: Nichole Michmerhuizen and Christine Timmer)

“Characterizing the Biomolecular Interactions between Insulin and G-Quadruplex DNA”

19. Matthew Manninen, Biochemistry **Ferris State University**
(Co-Authors: Kim K Colvert)

"Isolation and Characterization of Recombinant Saccharomyces cerevisiae Cytochrome C Peroxidase"

20. Michael J. Hicks, Biochemistry **Kalamazoo College**
(Co-Authors: Mara R. Livezey, Laura E. Diffenderfer, Leslie D. Nagy, Laura Lowe Furge.)

"Covalent Modification of CYP2D6 by SCH66712 at Thr309"

21. Ola-Oluwakiti Alabi, Biochemistry **Calvin College**
(Co-Authors: Dr. Larry Louters, Benjamin Kuiper, Stephen Gunnink)

"Curcumin Inhibits the Glucose Transport Activity of GLUT1"

22. Riemer Praamsma, Biochemistry **Calvin College**
(Co-Authors: Eric Arnoys)

"Mechanism of Glucose Transporter Protein"

23. Robert Vaughan, Biochemistry **Grand Valley State University**

"A valine/leucine clamp controls the carbapenemase activity of OXA-24"

24. Ryan Martinie, Biochemistry **Calvin College**
(Co-Authors: Anand Divakaran, Elizabeth Porter, Nate Myton, Drew Roth, Taylor Hegg, David Benson)

"Formation Chemistry of Tyrosine-Cysteine Crosslinks"

25. Sara Lang, Biochemistry **Hope College**
(Co-Authors: Anne Georges and Dr. Leah Chase)

"Identification of Endocytic Motifs in the C-Terminus of xCT"

26. Stephen Gunnink, Biochemistry **Calvin College**
(Co-Authors: Ben Kuiper, Ola Alabi, Dr. Larry Louters)

"Detection of Activated GLUT1 in L929 and HCLE cells"

27. Shelby Lofthus, Biochemistry **Calvin College**
(Co-Authors: Douglas Vander Griend)

"Solution Phase Self-Assembly of a Cubic Nanocage"

28. Zachary Hundley, Biochemistry **Grand Valley State University**
(Co-Authors: Neil V. Klinger, Rachel A. Powers, and David A. Leonard)

"Two mutations are necessary to convert class D β -lactamase function to β -lactam sensor function"

29. Eric Edewaard, Biology **Van Andel Research Institute**

“Tissue-Based comparisons of RNA integrity and purity”

30. Richard Marmion, Biology **Grand Valley State University**

(Co-Authors: Dr. Margaret A. Dietrich Professor)

“Abnormal initial cell formation in Physcomitrella patens”

31. Julia Slopsema, Biomedical Engineering **Hope College**

(Co-Authors: Johanna Forst Derek Blok Dr. Katharine Polasek)

“Surface Stimulation for Distal Sensation Threshold”

32. Erica J. Chan, Biophysics **Calvin College**

(Co-Authors: Kyle T. Bussis, Paul E. Harper)

“Monosaccharide Inclusion and Exclusion in Lipid-Water Phases”

33. Jordan Presley, Biotechnology **Alma College**

(Co-Authors: Jordan T. Presley, Emily M. Brogan, Scott B. Thourson, Shannon J. Timpe, Brian J. Doyle)

“A Quartz Crystal Microbalance Biosensor for Analysis of Herbal Medicine”

34. Lauren Clements, Biotechnology **Ferris State University**

“Effects of UVA on Photorepair in p53 Mutant Zebrafish”

35. Abigail Dutkiewicz, Cell and Molecular Biology / Genetics **Ferris State University**

(Co-Authors: Maurisa Flynn Riley and Guillermina Lozano)

“Using Mouse Models to Investigate Chromosomal Abnormalities Resulting from Altering the p53 Pathway”

36. Anirudh Chawdhary, Cell and Molecular Biology / Genetics **Grand Valley State University**

(Co-Authors: Anirudh Chowdhary, Thomas Rogers, Anitha Menon, William Schroeder, Robert Smart , Agnieszka Szarecka, and Suganthi Sridhar 1)

“Investigating the Effects of BIBR1532 and Related Analogs on Telomerase Activity in Human Prostate Cancer Cells (PC3-Parental)”

37. Anna Plantinga, Cell and Molecular Biology / Genetics **Calvin College**

(Co-Authors: Katie R. Martin and Jeffrey P. MacKeigan)

“Myotubularins as PI(3)P Phosphatases in Autophagy and Endocytosis”

38. Anthony Gasparotto, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Mona Soni, Brittany Gasper, Dr. Virginia McDonough-Stukey)

“Examining lipid trafficking in eukaryotic cells using the Saccharomyces cerevisiae trafficking mutant mon2Δ”

39. Chelsea Wallace, Cell and Molecular Biology / Genetics **Kalamazoo College**
(Co-Authors: C.M. Dobbins and D.B. Moore)

“ENDOPLASMIC RETICULUM-TARGETTED BCL-2 RESCUES SH-SY5Y NEUROBLASTOMA CELLS FROM ETHANOL TOXICITY”

40. Daniella Hartwig, Cell and Molecular Biology / Genetics **Calvin College**

“Isolation and Investigation of Phages from Bacterial Communities of Biomphalaria glabrata Snails”

41. Danielle Goodman, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Daniel Obregon)

“Investigating the Cytotoxic Effects of Mycobacteriophage Vix Gene 80”

42. Danielle Maryanski, Cell and Molecular Biology / Genetics **Grand Valley State University**

“Type II MADS-box genes isolated from the gymnosperm cones of Ephedra and Juniper”

43. Elizabeth Billquist, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Jessica Kozack, Shelby Peterson, Aaron Putzke)

“Fer kinase regulates Notch signaling required for proper vasculature and red blood cell formation in Zebrafish.”

44. Elizabeth Hidlebaugh, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Mary Bradley, Daniel A. Smith, NaTasha Schiller, Leah Chase)

“Activation of System xc- Trafficking via an Akt-dependent Signal Transduction Pathway”

45. Elizabeth Schleh, Cell and Molecular Biology / Genetics **Calvin College**

“Does a Phytoplankton Have a Defense Against Its Predator”

46. Emily Brogan, Cell and Molecular Biology / Genetics **Alma College**
(Co-Authors: Jordan T. Presley, Emily M. Brogan, Scott B. Thourson, Shannon J. Timpe, Brian J. Doyle)

“A Quartz Crystal Microbalance Biosensor for Analysis of Herbal Medicine”

47. Eric Cox, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Dr. Joseph Stukey Dr. Virginia McDonough-Stukey)

“A Toxic Ride through the Pumpkin Patch: Identification of Cytotoxic Regions in Mycobacteriophage Pumpkin”

48. Heidi Dykstra, Cell and Molecular Biology / Genetics **Calvin College**

"Investigating Delta-Sarcoglycan N-glycosylation Site Mutants Using Adenovirus Transduced Cell Models"

49. Jamie Grit, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Dr. Steve Triezenberg)

"Post-translational modification of a key transcription factor for herpes simplex virus infection"

50. Jenna Kennedy, Cell and Molecular Biology / Genetics **Calvin College**
(Co-Authors: Mark P. Schotanus, Alex R. Stoddard, John L. Ubels)

"Efficacy of Antioxidants in the Corneal Epithelium"

51. Jenna Tenney & Jillian Konyndyk, Cell and Molecular Biology / Genetics **Calvin College**

"Let Thy Food be thy Medicine: Investigating Nutraceutical Properties of Cruciferous Vegetables"

52. Jessica Thoe, Cell and Molecular Biology / Genetics **Grand Valley State University**
(Co-Authors: Dawn Clifford Hart)

"Characterizing Protein-protein Interactions for Accurate Cell Division in Fission Yeast"

53. Jonathan Y. Lin, Cell and Molecular Biology / Genetics **Calvin College**
(Co-Authors: Julia M. Santos, Ph.D)

"Temporal Relationship Between Activation of Matrix Metalloproteinase 9 and Mitochondria Damage in the Development of Diabetic Retinopathy"

54. Kelsey Perry, Cell and Molecular Biology / Genetics **Grand Valley State University**
(Co-Authors: Amanda O'Brien, Agnieszka Szarecka, Troy Wymore, Nikolay Simakov)

"Development of CHARMM force field parameters for two different classes of beta-lactam antibiotics"

55. Lindsay Stoyka, Cell and Molecular Biology / Genetics **Grand Valley State University**
(Co-Authors: Jodee Hunt)

"Lonely Boy: Parental Division of Labor & Single Parenting in Convict Cichlids (Amatitlania nigrofasciata)"

56. Mary Bradley, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Elizabeth Hidlebaugh, Daniel A. Smith, NaTasha Schiller, Leah Chase)

"Activation of System xc- Trafficking via an Akt-dependent Signal Transduction Pathway"

57. Mary Durston, Cell and Molecular Biology / Genetics **Grand Valley State University**
(Co-Authors: Pushpaja Dodla, Jared Kaminski, Shambhavi Singh, Suganthi Sridhar, Cindy K. Miranti)

"Identifying a regulatory role for the tumor metastasis suppressor gene KAI1/CD82 in metastatic prostate cancer cell lines"

58. Matthew Harder, Cell and Molecular Biology / Genetics **Hope College**
(Co-Authors: Aaron Putzke)

"Investigating Fer Kinase Regulation of Gene Transcription During Development"

59. Patrick Bradley, Cell and Molecular Biology / Genetics **Ferris State University**

"The effects of Wnt inhibition on blastema formation and melanocyte re-population on the adult zebrafish."

60. Yelena Boykov, Cell and Molecular Biology / Genetics **Calvin College**
(Co-Authors: John Morris, Anding Shen, Mary Dekker)

"The Role of Cell Cycle Status and Cytokine Influence in HIV Infection of Resting T-cells Co-Cultured with Endothelial Cells"

61. Alexander Urech, Chemistry **Western Michigan University**
(Co-Authors: Gellert Mezei, Isurika Fernando, and Stuart Surmann)

"Selective total encapsulation of anions by neutral, hydrophobic nano-jars"

62. Alexandra Bouza, Chemistry **Grand Valley State University**
(Co-Authors: Dr. Robert Smart, PhD)

"Combinatorial Synthesis of Semiconductor Oxides for Solar Water Splitting"

63. Andrea Bootsma, Chemistry **Calvin College**
(Co-Authors: Professor Mark Muyskens)

"The Fluorescence of Aqueous Sycamore Extracts"

64. Brett De Vries, Chemistry **Calvin College**
(Co-Authors: Prof. Mark Muyskens)

"Structure, hydrogen bonding, and barriers to rotation of 1-fluoro-pentane-2,4-dione and related compounds"

65. Caleb Uitvlugt, Chemistry **Calvin College**
(Co-Authors: Jin Sung)

"Electrochemistry of Catechols"

66. Cameron Holder, Chemistry **Hope College**
(Co-Authors: Evan E. Rugen and Mary E. Anderson)

"Synthesis and Characterization of Thermoelectric PbTe Nanoparticles"

67. Carline Dugue, Chemistry **Kalamazoo College**
(Co-Authors: Liyana A. Wajira Ariyadasa and Sherine O. Obare)

"Studying the Charge Transfer Size Dependence between Semiconductor Quantum Dots and Quantized Metal Nanoparticles"

68. David C. Wierenga, Chemistry **Calvin College**
(Co-Authors: Nicholas W. Vryhof and Dr. Carolyn E. Anderson)

"Gold(I)-Catalyzed Synthesis of N-Alkyl Pyridones"

69. Emily Golz, Chemistry **Calvin College**
(Co-Authors: Professor Doug Vander Griend, Ph.D.)

"Modeling the Oligomerization of Cationic Methylene Blue in Aqueous Solution"

70. Erran D. Briggs II, Chemistry **Kalamazoo College**
(Co-Authors: Erran D. Briggs, Amanda K. Bolles, Mara R. Livezey, Leslie D. Nagy, Laura Lowe Furge)

"CYP2D6 is the Major Metabolizing Enzyme of Metoclopramide"

71. Evan Rugen, Chemistry **Hope College**
(Co-Authors: Cameron F. Holder and Prof. Mary E. Anderson)

"The Synthesis and Characterization of Bi₂Te₃ Nanoparticles"

72. Graham Carlson, Chemistry **Hope College**
(Co-Authors: Kara Cousins, Kimberly Brien, Pravin Patil, and Moses Lee)

"DNA Sequence Specific Recognition by Building Block Hx Polyamides I."

73. Hope T. Sartain, Chemistry **Grand Valley State University**

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74. Jacqueline Williams, Chemistry **Grand Valley State University**
(Co-Authors: Dr. Matthew E. Hart)

"Synthetic Approach of A Thyronamine Known as the Urea Compound"

75. James Bour, Chemistry **Hope College**
(Co-Authors: Jacob C. Green, Jeffrey B. Johnson)

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(Co-Authors: Carolyn Anderson, Mitch Groenenboom, Emily Rhude)

“Efforts Towards the Synthesis of Amino-Substituted beta-Iodo N-Alkenyl Pyridones”

77. John R. Strikwerda, Chemistry Calvin College
(Co-Authors: Eric X. Yu, Roger L. DeKock)

“Atomic size, ionization energy, polarizability, asymptotic behavior, and the Slater-Zener model”

78. Jonathon Vandezande, Chemistry Calvin College

“Extent of Reaction”

79. Jordyn Betz & Lacey Lemke, Chemistry Grand Valley State University

“The role of textbooks: does the course content or faculty member matter?”

80. Joseph M. Dennis, Chemistry Hope College
(Co-Authors: Catherine M. Calyore, Jeffrey B. Johnson)

“Nickel Catalyzed Direct Addition of Diorganozinc Nucleophiles to Substituted Phthalimides”

81. Kelly Bresnhan, Chemistry Kalamazoo College
(Co-Authors: Jessica Priebe, Emily Jutkiewicz, James Woods)

“Characterization of Cholinergic Receptor Agonists Nicotine and Arecoline Using Drug Discrimination”

82. Kevin Olson, Chemistry Hope College
(Co-Authors: Samuel Tzou, Vijay Satam, Kimberly Brien, Pravin Patil, Balaji Babu, Matt Gregory, Michael Bowerman, Mia Savagian, Megan Lee, Yang Liu, Joseph Ramos, W. David Wilson, Shicai Lin, Kostantinos Kiakos, John Hartley, and Moses Lee)

“Complete Analysis on the Two Base Pair Sequence Recognition by Hx (p-Anisylbenzimidazole)•Pyrrole and Hx•Imidazole Pairings”

83. LaNora Herrema, Chemistry Grand Valley State University
(Co-Authors: Adam C. Boyden Michael T. Peruzzi Eric J. Werner Shannon M. Biro)

“Investigations into a lovely world of multi-faceted chelating agents: potential applications to medical imaging, nuclear remediation, and fluorescence”

84. Mallory Smith, Chemistry Hope College
(Co-Authors: Jacqueline Peacock, Ph.D. and Matthew Steensma, M.D.)

“Effects of Doxorubicin on Neurofibromatosis Type 1 Associated Malignant Peripheral Nerve Sheath Tumor cells”

85. Matthew Haveman, Chemistry Calvin College
(Co-Authors: Prof. Douglas A. Vander Griend)

“Modeling Complex Solutions: Towards a Web Based Tool”

86. Michael J. Lubben, Chemistry Calvin College
(Co-Authors: Douglas A. Vander Griend)

“Spectrophotometric Study of the Metal Complexes of a Tripodal Ligand”

87. Michael Peruzzi, Chemistry Grand Valley State University

“Synthesis of Novel Tripodal CMPO Compounds for Heavy Metal Chelation”

88. Michelle Irvin, Chemistry Hope College
(Co-Authors: Kimberly Brien, Pravin Patil, and Moses Lee)

“A Building Block Approach: A New Way of Thinking about Polyamides and Their Impact on DNA Sequence Recognition II.”

89. Paul Belmonte, Chemistry Grand Valley State University
(Co-Authors: Laurie Witucki, William Schroeder, Roderick Morgan, Robert Smart)

“Synthesis of Novel Antimicrobial Agents Containing Peptide Bonds”

90. Nicholas Sweda, Chemistry Kalamazoo College
(Co-Authors: Alyssa McNamara and Regina Stevens-Truss)

“Suramin Distinguishes Between the Calmodulin Binding Sequences of Inducible and Neuronal Nitric Oxide Synthase”

91. Samantha Ellis, Chemistry Grand Valley State University

“MACROMOLECULAR ASSEMBLIES FOR GAS STORAGE FROM DYNAMIC BONDS”

92. Sarah Fodor, Chemistry Hope College
(Co-Authors: Dr. Jeffery Johnson, Jessica Simmons)

“Investigating the Scope of Decarbonylative Cross Coupling Reactions of Cyclic Imides Implementing a Nickel Catalyst”

93. Thomas Finn, Chemistry Aquinas College
(Co-Authors: Dr. Elizabeth Jensen)

“A Colorimetric, Paper-Based Test for Deltamethrin and Permethrin”

94. Abigail J. Strelman, Computational Biology / Bioinformatics Calvin College
(Co-Authors: J. Grant Fahey, Serita M. Nelesen, John T. Wertz)

“HTMAD: Software Design for MALDI-TOF based Microbial Community Analysis”

95. Alex Roemer, Computational Biology / Bioinformatics **Van Andel Research Institute**
(Co-Authors: Andrew Borgman, Daniel Hodges, Lisa Kefene, Jenea Chesnic, Alison Ruhe, Mark Neff)

"Informatics and the canine model for genetic analysis of complex diseases"

96. Amanda Schuiling, Computational Biology / Bioinformatics **Hope College**
(Co-Authors: Dr. Brian Yurk, Dr. Aaron Putzke, Dr. Airat Bekmetjev, Joseph Adamson, Kristen Bosch, Bennett Riddering, Daniel Faghihnia, Alicia Castillo)

"Predicting Insect Development in Changing Climates: Bean Beetle Phenology Modeling"

97. James LaFleur, Computational Biology / Bioinformatics **Grand Valley State University**
(Co-Authors: Troy Wymore and Agnieszka Szarecka)

"Multiple Sequence Alignment and Phylogeny of Class D Beta-Lactamases"

98. Peter VandeHaar, Computational Biology / Bioinformatics **Calvin College**
(Co-Authors: Professor Loren Haarsma and Professor Serita Nelesen)

"Pykaryote: A Computer Model of the Evolution of Complexity in Digital Organisms"

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"Smarter Searching Through Knowledge Representation"

100. Justin Closs, Computer Science **Alma College**

"Real-Time Fluid Flow: Solving the Navier-Stokes Equations for Interactive Simulations"

101. Brennan Sieck, Ecology and Evolution **Hope College**

*"Effects of a Fungal Endophyte on Resource Allocation in the grass *Lolium arundinaceum*"*

102. Chase Baldwin, Ecology and Evolution **Grand Valley State University**
(Co-Authors: Dr. Robert Hollister and Tim Botting)

*"The Response of the Sedge Genus *Carex* to Warming"*

103. Clayton Luyk & Gwen Oster, Ecology and Evolution **Calvin College**
(Co-Authors: Nate Haan and Dr. David Warners)

"Native Plant Propagation, Ecological Restoration, and Management"

104. Danielle Dekoski, Ecology and Evolution **Grand Valley State University**

*"Mantled howler monkey (*Alouatta palliata*) vocalizations as an intergroup spacing mechanism on Ometepe Island, Nicaragua"*

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- 105. Geneva Langeland, Ecology and Evolution** Calvin College
(Co-Authors: Dr. Randy Van Dragt and Dr. David Warners)
"Sustainability @ Calvin.edu"
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- 106. Holly Vander Stel, Ecology and Evolution** Hope College
(Co-Authors: Austin Homkes, Jeffrey Corajond, James Tufts, Kenneth Brown, Jianhua Li)
"Phylogenetic and phytochemical studies of Apios (Fabaceae)."
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- 107. Jamin Wieringa, Ecology and Evolution** Hope College
"Role of Plant Hormones in the Signaling the Production of Alkaloids by an Endophytic Fungus, Neotyphodium"
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(Co-Authors: Eric Snyder)
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- 109. Jonathan Turkus, Ecology and Evolution** Hope College
"Influence of Fungal Endophytes on Insect Herbivore Defense in Canada Wildrye (Elymus canadensis)"
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- 110. Kristen Zemaitis, Ecology and Evolution** Grand Valley State University
"Sea Turtle Nesting in Guanacaste, Costa Rica: Effects of Temperature and Sea Level Rise"
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- 111. Leah Sienkowski, Ecology and Evolution** Calvin College
"Effectiveness of Paper Mulch as an Organic Weed Control Method in Lettuce Production"
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- 112. Neil Gilbert, Ecology and Evolution** Calvin College
"Floral Inventory and Phenology at Flat Iron Lake Preserve"
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- 113. Tina Van Doornik, Ecology and Evolution** Michigan State University
(Co-Authors: Cristina Portales, Elizabeth Schultheis, Tomomi Suwa)
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- 114. Stephen Healy, Economics** Calvin College
(Co-Authors: Loren Haarsma and Becky Haney)
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- 115. Caleb Reese, Engineering** Calvin College
(Co-Authors: Lucas Timmer and Dr. Matthew Heun (Principle Investigator))
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- 116. Kelsey Garlock, Forensic Biology** **Ferris State University**
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- 118. Melissa Braun, Geology** **Calvin College**
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- 119. John Morris, Immunology** **Calvin College**
(Co-Authors: Anding Shen)
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- 120. Elizabeth Hibma, Mathematics** **Calvin College**
(Co-Authors: Elizabeth Hibma, Hwa Pyeong Kim, Jonathan Timkovich, Advisor: Professor Todd Kapitula)
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- 121. Noah Davis, Mathematics** **Aquinas College**
(Co-Authors: Dr. Michael McDaniel)
"Squaring the circle in hyperbolic geometry"
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- 122. Yeon Hyang Kim, Mathematics** **Central Michigan University**
(Co-Authors: Yeon Hyang Kim, Karleigh Cameron, Michael Gustin, John Holden and Stacy Siereveld)
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- 123. Andrea Engerson, Microbiology** **Grand Valley State University**
(Co-Authors: Timothy Ramnarine and Derek Thomas)
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- 124. Andrew Valesano, Microbiology** **Hope College**
(Co-Authors: Maria Eguiluz)
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- 125. Ariangela Davis, Microbiology** **Calvin College**
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126. Arlene Hoogewerf, Microbiology Calvin College
(Co-Authors: Julia Hilbrands, William Burmeister, Arlene Hoogewerf)

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127. Austin DeGroff, Microbiology Calvin College
(Co-Authors: John Wertz, Ph.D)

"Isolation of Novel Verrucomicrobia and Other Herbivory Associated Microbes from Gut of Cephalotes varians"

128. Brandy Hammond, Microbiology Calvin College
(Co-Authors: Fabiola Enriquez and Dr. Amy Wilstermann)

"Role of Bacteria in the Premature Rupture of Fetal Membranes"

129. Christopher Stretton, Microbiology Grand Valley State University
(Co-Authors: Dr. Roderick Morgan and Dr. William Schroeder, Dr. Robert Smart)

"Antibacterial Activity of GV-1 Chemical Derivatives in the Presence of Human Serum"

130. Justin Kelsey, Microbiology Muskegon Community College

"Anaerobic Digester (A Look At Potential Substrates)"

131. Kelsey Veldkamp, Microbiology Calvin College
(Co-Authors: Malak Alkanani, Abbey Bell, Amy Bohner, Aaron Burghgraef, Jodie DeVries, Thomas Everding, Stacy Hooker, Christopher Jansma, Jessica Lang, Jonathan Lin, Jordan Newhof, Ian Noyes, Lisa Schultz, Shawntavia Stewart, Peter VandeHaar, Josue Vasquez, Kara Venema)

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132. Lauren Bauer, Microbiology Aquinas College
(Co-Authors: Jennifer Hess)

"The Effect of Garlic on Streptococcus mutans Biofilm Formation on Orthodontic Wire in Mono- and Dual-Species Cultures"

133. Lisa McLellan, Microbiology Hope College
(Co-Authors: Dr. Aaron Best)

"Regulation of hyaluronic acid metabolism in Streptococcus pneumoniae by RegR"

134. Rachel Burckhardt, Microbiology Alma College
(Co-Authors: Eric Montoye and Dr. Timothy P. Keeton)

"Determination of Antibiotic Resistance in E. coli Isolated from Mid-Michigan Streams Affected by Large Livestock Operations"

135. Tyler Mitchell, Microbiology **Cornerstone University**

"Cytotoxicity and Neutralization of Clostridium difficile Toxin B"

136. Abigail Lindberg, Neuroscience **Hope College**

(Co-Authors: Sara Gallemore and Dr. Gregory Fraley)

"Involvement of the gpr30 Receptor in Resveratrol's Neuroprotective Mechanism"

137. Andrew Dolehanty, Neuroscience **Hope College**

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138. John Capodilupo, Neuroscience **Grand Valley State University**

(Co-Authors: Emily Andrews, Daniel Capodilupo, Rebekah Hazel, Johnathon Kisner, Eric Sesselman)

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139. Jonathan Wong, Neuroscience **Calvin College**

(Co-Authors: Josiah Sinclair, Paul Moes, Loren Haarsma)

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140. Rachel Haas, Neuroscience **Hope College**

"The Maintenance of Reproductive Status in Pekin Drakes Requires Both Red and Blue Wavelengths of Light: Relationship to Opsin-Related Proteins in the Hypothalamus"

141. Sabrina Parker, Neuroscience **Central Michigan University**

(Co-Authors: Genevieve Beauvais, Darcy Kaufman, Jennifer Steiner, and Patrik Brundin)

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142. Alex Stoddard, Organism Biology / Physiology **Calvin College**

(Co-Authors: John L. Ubels)

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143. Chelsea Campbell, Organism Biology / Physiology **Hope College**

(Co-Authors: Sarah Colton, Rachel Haas, Elizabeth Gerometta, Erika Coombs, Susan M. Fraley and Gregory S. Fraley)

"Descriptive Analyses of the Development of Gait in Pekin Ducks from Hatch to Market Weight"

144. Elaine Sheikh, Organism Biology / Physiology **Grand Rapids Community College**

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145. Hannah Stone, Organism Biology / Physiology Alma College
(Co-Authors: Morgan Bauman, John E. Davis, Maurie J. Luetkemeier)

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146. Janine O'Donnell, Organism Biology / Physiology Aquinas College
(Co-Authors: Thomas E. Bahl, PhD)

"Sex, Age, and Quantitative Motor Recruitment"

147. Jessica Darusz, Organism Biology / Physiology Calvin College
(Co-Authors: Huong Tran, Sarah Green, Martina Ralle, and Randall Woltjer)

"Metal content of cerebral white matter in aging and dementia"

148. Meagan Mc Rae & Monica Langeland, Organism Biology / Physiology Calvin College
(Co-Authors: Keith A. Grasman and Sylvia Fuhrman)

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149. Meredith Rice, Organism Biology / Physiology Hope College
(Co-Authors: M. Makagon, R. Fulton, D. Karcher, PhD)

"The Relationship between Pekin Duck Musculoskeletal Issues and Gait Scores"

150. Noah Zucker, Organism Biology / Physiology Grand Valley State University
(Co-Authors: Allison Desautels, Eric Spencer, Kara Winczkowski, David Kurjiaka)

"Influence of glucose on growth of cultured mouse endothelial cells"

151. Sarah A Colton, Organism Biology / Physiology Hope College

"The Effects of Environmental Enrichment Devices on Feather Picking in Commercially Raised Pekin Ducks"

152. Tami Brown, Organism Biology / Physiology Grand Valley State University
(Co-Authors: Laurelin M. Martin, Timothy M. Evans, Neil W. MacDonald)

"Using DNA Barcoding for Plant Identification in a Long-term Prairie Restoration Study"

153. William Waalkes, Organism Biology / Physiology Grand Valley State University
(Co-Authors: Daniel Bergman, PhD)

"Pollutant Effects on Neurophysiological Recordings from Sensory And Motor Neurons Of The Crayfish"

154. Clarence Salazar, Other (Co-Authors: X. Hong, D. Portney, NL. Lehman) <i>"Combination Treatment focused on Aurora A in Glioblastoma"</i>	Ferris State University
155. Andrew Hess, Physics (Co-Authors: Shaun Alsum, Margeaux Carter, Jake Lampen, Professor Matt Walhout) <i>"Producing and Detecting a Beam of Metastable Krypton Atoms"</i>	Calvin College
156. Brooke Jeries, Physics (Co-Authors: S.K. Remillard) <i>"Mapping the Nonlinearity of Superconductive Passive Circuits"</i>	Hope College
157. Caitlin Ploch, Physics (Co-Authors: Stephen Remillard) <i>"Electromagnetic Dispersion in Periodic Structures"</i>	Hope College
158. Emma Patmore, Physics <i>"T-duality in String Theory"</i>	Alma College
159. Jacob Lampen, Physics (Co-Authors: Shaun Alsum, Margeaux Carter, Andrew Hess, Dr. Matthew Walhout) <i>"Patterns in Lattice-Driven Discharges with Anisotropic Filament Interactions"</i>	Calvin College
160. Jeremy Peshl, Physics (Co-Authors: Dr. Karen Gipson) <i>"Explorations in Sonoluminescence"</i>	Grand Valley State University
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163. Kyle Bussis, Physics (Co-Authors: Erica Chan and Paul Harper) <i>"Disaccharide Inclusion and Exclusion in Lipid-Water Phases"</i>	Calvin College

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- 164. Margeaux Carter, Physics** Calvin College
(Co-Authors: Shaun Alsum, Andrew Hess, Jacob Lampen, Prof. Matthew Walhout)
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- 165. Michael Dykstra, Physics** Grand Valley State University
(Co-Authors: Anderson Peck and Anthony Chang)
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- 166. Nathan Harkema, Physics** Calvin College
(Co-Authors: Christian Woolley and Eddy Chen)
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- 167. Robert Meier, Physics** Grand Valley State University
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- 168. Shaun Alsum, Physics** Calvin College
(Co-Authors: Margeaux Carter, Andrew Hess, Jacob Lampen, Dr. Matthew Walhout.)
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- 169. Logan Rowe, Plant Molecular Biology/Phylogenetics** Western Michigan University
(Co-Authors: Jessica Barboline)
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- 170. Lauren Bender, Psychology** Calvin College
(Co-Authors: Julie E. Yonker, Laura G. DeHaan)
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- 171. Dr. Hugh Brown, Science Education** Pierce Cedar Creek Institute
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- 172. Simon Veldkamp, Science Education** Calvin College
(Co-Authors: Paula Kuiper, Simon Veldkamp, Herb Fyneweever)
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- 173. Alain Bretous, Biological Sciences, Biomolecules** Wayne State University
(Co-Authors: Danielle N. Dremann, and Professor Christine S. Chow, Department of Chemistry, Wayne State University)
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