



MURDOCK
COLLEGE SCIENCE RESEARCH PROGRAM

*Celebrating 25 Years in
Supporting Undergraduate
Research*

THE 25th ANNUAL MCSR CONFERENCE

SPONSORED BY THE M.J. MURDOCK CHARITABLE TRUST



CO-HOSTED WITH GONZAGA UNIVERSITY

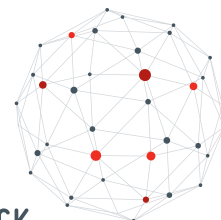




25th Annual MCSR Conference

"Celebrating 25 Years in Supporting Undergraduate Research"

Spokane Convention Center, Spokane, WA
Co-host: Gonzaga University & M. J. Murdock Charitable Trust



MURDOCK
COLLEGE SCIENCE
RESEARCH PROGRAM

Thursday, Nov. 3, 2016

5:00 – 9:00 p.m. Registration will be available - Lobby of DoubleTree Hilton Hotel
322 N Spokane Falls Ct., Spokane, WA 99201

Friday, Nov. 4, 2016 You may put up your poster at your assigned spot in Room 111ABC starting at 6:45 am.

6:30 – 7:45 a.m. **REGISTRATION** – Room 103

BREAKFAST – Room 100BC

6:45 – 7:45 a.m. **WORKING BREAKFAST** – Room 102BCD -For judges and MCSR program consultants

7:50 – 8:20 a.m. **OPENING / WELCOME** – Room 100BC

- MC – Dr. Moses Lee, *Program Director, M.J. Murdock Charitable Trust*
- Dr. Thayne M. McCulloh, *President, Gonzaga University*
- Invocation, Fr. Frank Case, *Vice President for Mission, Gonzaga University*

8:50 – 11:50 a.m. **ORAL PRESENTATIONS**
Presentations are 20 minutes in lengths (15 minutes presentation and 5 minutes for Q&A)

SYMPOSIUM ON PHYSICAL SCIENCES

Room 100B

Presider: Dr. David Patrick, *Professor of Chemistry, Western Washington University;*

Microphone: Dr. Craig Montgomery, *Professor of Chemistry and Dean of Natural and Allied Sciences, Trinity Western University*

SYMPOSIUM ON LIFE SCIENCES

Room 100C

Presider: Dr. Mia Bertagnolli, *Chair and Professor of Biology, Gonzaga University;*

Microphone: Dr. Tim Otter, *Professor of Biology and Director of Corporate and Foundation Relations, College of Idaho*

10:10 – 10:30 a.m. **BREAK**

11:50 a.m. – 1:15 p.m. **LUNCH** – Room 100BC
SET UP POSTERS – Room 111ABC

Noon – 1:00 p.m. **ENRICHMENT PRESENTATIONS** – Room 102BCD – For Administrators, Faculty, Staff
Begins promptly at 12:05 p.m. Head to room right after the oral presentations, plated lunch will be on the table.

1:00 – 5:15 p.m. **GRADUATE AND VENDOR EXHIBITION** – Room 111ABC

Please have posters up and ready.

1:15 – 3:00 p.m. **POSTER SESSION #1 (odd numbered posters)** – Room 111ABC

3:00 – 4:45 p.m. **POSTER SESSION #2 (even numbered posters)** – Room 111ABC

4:45 p.m. **TAKE DOWN POSTERS** – Room 111ABC



6:00 – 8:30 p.m.
(Dressy casual attire)

BANQUET – Room 100BC

MC: Dr. Moses Lee

Welcome: Dr. Patricia O'Connell Killen, *Academic Vice President, Gonzaga University*

Welcome: Dr. Steve Moore, *Executive Director, M.J. Murdock Charitable Trust*

INAUGURAL SCIENTIFIC RESEARCH AWARDS: Special Recognition and Announcements
Drs. Lee and Moore

NEAL THORPE MEMORIAL LECTURE: *“Observing the Ocean from the Pacific Northwest and Beyond: Why it Matters”*

Dr. Jan Newton, PhD, *Principal Oceanographer with the Applied Physics Laboratory at the University of Washington; Affiliate Professor in UW School of Oceanography and the School of Marine and Environmental Affairs; Executive Director of the Northwest Association of Networked Ocean Observing Systems (NANOOS)*

Saturday, Nov. 5, 2016

7:00 – 8:00 a.m. **BREAKFAST** - Room 100BC

8:00 – 11:20 a.m. **ORAL PRESENTATIONS**

Presentations are 20 minutes in lengths (15 minutes presentation and 5 minutes for Q&A)

SYMPOSIUM ON PHYSICAL SCIENCES

Room 100B

Presider: Dr. Jessica Kleiss, *Assistant Professor of Environmental Science, Lewis and Clark College;*

Microphone: Dr. John Rowley, *Assistant Professor of Chemistry, Carroll College*

SYMPOSIUM ON LIFE SCIENCES

Room 100C

Presider: Dr. Bryan Thines, *Assistant Professor of Biology, University of Puget Sound;*

Microphone: Dr. Robert Bode, *Assistant Professor of Biology, St. Martin's University*

9:20 – 9:40 a.m.

BREAK

11:20 – 11:50 a.m.

CHECK OUT

11:50 a.m. – 1:00 p.m.

LUNCH – Room 100BC

12:45 – 1:15 p.m.

CLOSING/AWARDS – Room 100BC

Award Recipients.

A photo will be taken when you receive the award. After all awards have been made, all awardees and their faculty research mentors are asked to come up for a group picture.

• MC: Dr. Moses Lee

• Dr. Jeff Watson, *Director of the Center for Undergraduate Research & Creative Inquiry, Gonzaga University*

• Dr. John Van Zytveld, *Senior Fellow, M.J. Murdock Charitable Trust*

• Dr. Steve Moore

Faculty Enrichment Workshop - Those who have received information about the workshop, please meet at the registration area immediately following the conference to catch the bus to Gonzaga University. **The bus will leave promptly at 1:40 p.m.**

Following the conference, please be sure to complete this **short survey**:

<https://www.surveymonkey.com/r/MNSVW2Y>

You will also receive an email with this link. Your input is greatly valued and very much appreciated.

Lost Items: Bring to Room 103 (registration desk).

After the conference, all lost & found items will be brought to the Convention Center.



PARTICIPATING GRADUATE SCHOOLS & SCIENTIFIC INSTRUMENTATION VENDORS

Friday, November 4th, Room 111ABC

1:00 – 5:15 PM

1. Ben Alderete, *Imaging Specialist, MilliporeSigma (a business of Merck, KGaA)*
2. Krista Baziak, *Graduate Recruiter, Montana State University*
3. Kay Brothers, *Coordinator, Integrated Program in Biomedical Sciences, College of Veterinary Medicine, Washington State University*
4. Molly Burke, *Assistant Professor, Oregon State University*
5. Nima Dinyari, *Director, Optical Materials & Devices, University of Oregon*
6. David Eaton, *Dean & Vice Provost, The Graduate School, University of Washington*
Astrid Rivera, *Graduate School Advisor, The Graduate School, University of Washington*
7. Kristina Elkins, *Fiscal Specialist, Washington State University*
Raymond Herrera, *Assistant Dean, McNair Director, Graduate School, Washington State University*
Esther Pratt, *Associate Director, Foundation Relations, Washington State University*
Jill Wagner, *Academic Coordinator, Washington State University*
John Wyrick, *Associate Professor, Washington State University*
8. Beth Gee, *Program Coordinator, Boise State University, Biomolecular Sciences Graduate Programs*
9. Vanessa Green, *Director of Student Development & Diversity, Institute of Environmental Health, Oregon Health & Science University*
10. Larry Hinzman, *Vice Chancellor for Research, University of Alaska Fairbanks*
11. Sean Scoggin, *Graduate Recruitment Coordinator, University of Idaho - College of Graduate Studies*
12. Daniel Teraguchi, *Associate Dean for Student Affairs; Interim Associate Dean for Admissions & Recruitment, Elson S. Floyd College of Medicine at Washington State University*
13. Scott Whittenburg, *Dean of the Graduate School & VP Research, University of Montana*
14. Mia Yakawich, *Western Washington University Graduate School*



PHYSICAL SCIENCES

ORAL PRESENTATIONS

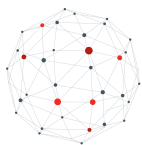
Friday, November 4th, Room 100B

8:50 AM – 11:50 AM; Presider Dr. David Patrick, Western Washington University

1. "Development and Analysis of a Zinc-responsive Lanthanide Complex for Effective Diagnosis of Prostate Cancer via PARACEST MRI" - Riley Meister; *Dr. Osasere Egbuomwan, Gonzaga University – 8:50 – 9:10*
2. "A Path Towards Curing Inoperable Brain Cancers Through MRI Imaging of Fluorine-Tagged Micelles" - Mitchell Pfortmueller; *Dr. Bruno Ameduri (Ecole Nationale Supérieure de Chimie de Montpellier), Dr. Vincent Ladmiral (Ecole Nationale Supérieure de Chimie de Montpellier), Fraser Parlange (University of British Columbia), Dr. Chadron Friesen, Trinity Western University – 9:10 – 9:30*
3. "Synthesis, Chemical Reactivity, and Medicinal Activity of Novel Chiral Piperidines" – Hannah Braunstein; *Dr. Timothy K. Beng and Dr. Blaise Dondji, Central Washington University – 9:30 – 9:50*
4. "Characterization of 4',6'-diamidino-2-phenylindol (DAPI) and p-dimethylaminocinnamic acid (MACA) as surface-enhanced Raman (SERS) tag molecules for bi-layered Raman intense gold nanostructures with hidden tags (BRIGHTs)" - Tori Wood, Allison Smith, Madison Gladding, Christopher Munjar; *Dr. Brian Gilbert, Linfield College – 9:50 – 10:10*

Break 10:10 - 10:30

5. "Developing Materials for the Purification of Natural Gas" - Bo Han and Hoan Nguyen; *Dr. Joel Gohdes, Pacific University – 10:30 – 10:50*
6. "Solar Cell – Oxidative Dimerization" – Lauren Rhoda; *Dr. Caroline Pharr, Carroll College – 10:50 – 11:10*
7. "Synthesis of ligands for improving the performance of nanocrystal-based luminescent solar concentrators" - Emily Woodward, Heather Towns; *Dr. R. Carlisle Chambers, George Fox University – 11:10 – 11:30*
8. "Block Copolymer Templated Bimetallic Nanoparticles for Catalysis in Fuel Cells" - Diane Perez; *Dr. David Rider, Western Washington University – 11:30 – 11:50*



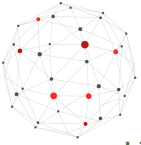
Saturday, November 5th, Room 100B

8:00 AM – 11:20 AM; Presider Dr. Jessica Kleiss, Lewis and Clark College

9. "Microwave-Assisted Synthesis of Praziquantel Derivatives and their Evaluation as Modulators of Aryl Sulfatase B Activity" - Lee Cantrell and Bret DeGraaff; *Dr. Trisha Russell, Whitworth University – 8:00 – 8:20*
10. "The Role of Myosin VI in Retinal Pigment Epithelium Phagocytosis" - Navindi Hewage; *Dr. David Altman, Willamette University – 8:20 – 8:40*
11. "Geochemistry and origins of thermal spring waters of the Olympic Peninsula and Cascade Range, Washington" - Jon K. Golla; *Dr. Jeffrey Tepper, University of Puget Sound – 8:40 – 9:00*
12. "Detailed Characterization of Europa's Ridge Morphology" - Janelle Heitmeier, Emily Martin, Jordan Bretzfelder, Alex Patthoff, Geoffrey Collins, and Thomas Watters; *Dr. Andrea Dobson, Whitman College – 9:00 – 9:20*
13. "Fire Mapping and Assessment Platform (FireMAP): A More Responsive, Affordable and Safe Method for Mapping Wildland Fire" – Mikhail Bowerman and Llewellyn Johnston; *Dr. Dale Hamilton, Northwest Nazarene University – 9:20 – 9:40*

Break 9:40 - 10:00

14. "Modeling Potential Erosion Effects of the Sherpa Wildfire using the RUSLE" – Tayler Duclos; *Dr. Jason Geck, Alaska Pacific University – 10:00 – 10:20*
15. "Segue 3: The Youngest Globular Cluster in Our Galaxy" - Rose Marie Haynes; *Dr. Joanne Hughes, Seattle University – 10:20 – 10:40*
16. "Sunspot Decay Rate Correlations and Temperature Ratios" - Kimberly B. Belmes; *Dr. Katrina M. Hay and Dr. Sean M. O'Neill, Pacific Lutheran University – 10:40 – 11:00*
17. "Analyzing Patterns of Industrial Odors in Portland Using Wind Measurements and Kriging" - Joseph Walker, Logan K. Simpson, Samantha G. Wright; *Dr. Ted C. Eckmann, University of Portland – 11:00 – 11:20*



LIFE SCIENCES

ORAL PRESENTATIONS

Friday, November, 4th, Room 100C

8:50 AM – 11:50 AM; Presider Dr. Mia Bertagnolli, Gonzaga University

1. "Transcriptome Annotation and Gene Expression Analysis of *Triticum monococcum* in Response to Cold Stress" – Netania Craig; *Dr. Samuel Fox, Saint Martin's University – 9:10 – 9:30*
2. "The effects of hydroperiod on invasive species *Culaea inconstans* and *Lithobates catesbiana* as evidenced by activity levels" – Megan Lantsberger; *Dr. Brook Swanson and Dr. Betsy Bancroft, Gonzaga University– 8:50 – 9:10*
3. "How does the density and frequency of competitors affect pollination?" – Jared Kawatani; *Dr. Stacey Halpern, Pacific University – 9:30 – 9:50*
4. "Blakely Island Deer, the Island Rule, and Developmental Heterochrony" – Karissa Courtney, Trevor Hildebrand, Julia Lippert, Brendan McMillen; *Dr. Cara Wall-Scheffler and Dr. Eric Long, Seattle Pacific University – 9:50 – 10:10*

Break 10:10 - 10:30

5. "Temporal niche partitioning between urban raccoons (*Procyon lotor*) and Virginia opossums (*Didelphis virginiana*)" – Destiny Mims; *Dr. Mark Jordan, Seattle University– 10:30 – 10:50*
6. "Description and distribution of marine mammal sightings during construction activities in the Knik Arm, Cook Inlet, Alaska in spring, 2016" – Lauren Himmelreich, D.J. Seagars, AECOM Inc.; *Dr. Leslie Cornick, Alaska Pacific University – 10:50 – 11:10*
7. "Does Poor Feeder Maintenance Increase Exposure of Hummingbirds to Pathogenic Bacteria and Fungi?" – Elizah Stephens; *Dr. Don Powers, George Fox University – 11:10 – 11:30*
8. "Biogeography of two Caribbean spider genera, *Theotima* and *Ochyrocera*, suggests an ancient presence in the region" – Ella Santana-Propper; *Dr. Greta Bindord, Lewis & Clark College– 11:30 – 11:50*



Saturday, November 5th, Room 100C

8:00 AM – 11:20 AM; Presider Dr. Bryan Thines, University of Puget Sound

9. "Cloning Isoprene Synthase From Heath Star Moss" – Matthew Logan; *Dr. Alison Fisher, Willamette University – 8:00 – 8:20*
10. "Kinetic studies of Cu(I) metalloproteins using Rapid Freeze Quench XAS" – Zachary Mathe, Ethan Ho and Jonathan Perkins, Ninian Blackburn (Oregon Health & Science University); *Dr. Kelly Chacón, Reed College – 8:20 – 8:40*
11. "Effect of synthetic cathinone on GnRH neurons in zebrafish" - Alicia Goin; *Dr. Siddharth Ramakrishnan, University of Puget Sound – 8:40 – 9:00*
12. "Exploring GABA Receptor Circuitry in the Zebrafish Lateral Line" – Megan Schwehr; *Dr. Cecilia Toro, Linfield College – 9:00 – 9:20*

Break 9:20 - 9:40

13. "Zinc Oxide Nanoparticles: Health Implications for the treatment of *Pseudomonas aeruginosa* infections" – Lexi Johnson and Brenden O'Neill; *Dr. Jamee Nixon, Northwest Nazarene University– 9:40 – 10:00*
14. "Exploding Popularity of Electronic-Cigarettes Risk Factor for Osteoporosis" - Hailey Chambers; *Dr. Sara Hegglund, College of Idaho – 10:00 – 10:20*
15. "Alteration of Host Cell Lipid Metabolism by Murine Herpesvirus 68 (MHV-68)" – Sarah Clark; *Dr. Tracie Delgado, Northwest University – 10:20 – 10:40*
16. "Immune Responses to a Cancer Vaccine in a Mouse Model of Breast Cancer" – Rochelle Shih; *Dr. Susan E. Murray, University of Portland – 10:40 – 11:00*
17. "Characterization of antibodies from HPV vaccinated women and identification of epitopes on the surface of HPV-16" – Kate Sizer, Erin Scherer, Robin Smith, Greg Wipf, Jody Carter, Denise Galloway; *Dr. Matt Craig, Whitman College – 11:00 – 11:20*



POSTER SESSIONS

POSTER A - ECOLOGY / EVOLUTION / BIODIVERSITY

- A-1 "Where do All the Isopods Go? A Population Study of *Pentidotea resecata*" – Sarah Anderson and Faith Hunnicutt; *Dr. David Cowles, Walla Walla University*
- A-2 "Use of Pellet Analysis to Determine of the Diet of the American Kestrel, *Falco Sparrevius*, in Pacific Northwest Cherry Orchards" – Kira Banner, Deanna Leigh (Western Washington University); *Dr. Karen Steensma, Trinity Western University*
- A-3 "Competition may lead to declines in American Kestrel (*Falco sparverius*) nest box use at the Ridgefield National Wildlife Refuge and its implications for management" – Ben Durham; *Dr. Brad Tripp, Warner Pacific College*
- A-4 "Polar Crustaceans have Larger Genomes: Latitudinal Variation in Genome Size in Amphipods and Decapods" – Lucas Bartholomew-Good; *Dr. Kristin Hultgren, Seattle University*
- A-5 "Regional Survey of Commercial Red-Raspberry Fields in the State of Washington for the Resistance-breaking Strain of Raspberry Bushy Dwarf Virus" – Rebecca M. Crust, Adrienne E. Scarcella; *Dr. Kara K. Lanning, Pacific Lutheran University*
- A-6 "Noninvasive Species Identification Protocol for Urban Mesocarnivores" – Lorraine Davis, Sam Levy; *Dr. Mark Jordan, Seattle University*
- A-7 "Effect of Humus and Structural Environmental Factors on Epiphytes in *Acer macrophyllum* in the Hoh Rainforest" – Emma Didier; *Dr. Carrie Woods, University of Puget Sound*
- A-8 "The Role of Habitat Specialization in Phylogeographic Divergence: A Comparison Of Three Lizard Species" – Nolan Endicott, Giang Nguyen, Lee Fitzgerald (Texas A&M); *Dr. Lauren Chan, Pacific University*
- A-9 "Inhibition of Seed Germination Bby Willow Extracts and Salicylic Acid" – Jeb English; *Dr. Ryan Ferrer, Seattle Pacific University*
- A-10 "Fire Monitoring and Assessment Platform (FireMAP)" – Joshua Gambill; *Dr. Dale Hamilton, Northwest Nazarene University*
- A-11 "Dear Enemies: Aggression Between Familiar and Stranger Cichlids" – Leilani Ganser, Reed College BIO 342 Class; *Dr. Susan Renn, Reed College*
- A-12 "Vocal Response of Black-capped Chickadees (*Peocile atricapillus*) to Presence of Cats in High and Low Cat Population Areas" – Emily Geddes; *Dr. Christopher Templeton, Pacific University*
- A-13 "Extreme Genome Size Variation in Snapping Shrimps (Family *Alpheidae*)" – Dylan Gnatz; *Dr. Kristin Hultgren, Seattle University*
- A-14 "A Functional Ecological Comparison of Three Sponge Species from the Lower Florida Keys" – Tyler Griffin; *Dr. Jeremy Weisz, Linfield College*
- A-15 "Weapon Performance of Rhinoceros Beetles" – Eric Gutierrez, Benjamin Buchalski; *Dr. Brook Swanson, Gonzaga University*
- A-16 "Effects of Habitat Restoration on Mammal Stress and Demography" – Summer Henricksen, Christina Salisbury; *Dr. Laurie Dizney, University of Portland*



- A-17 "Mercury (Hg) Cycling in Pacific Northwest Ecosystems: Insight from Old Growth Forests and Red-Tailed Hawks" – Kazuki Hibi; *Dr. Abir Biswas, The Evergreen State College*
- A-18 "Diversity of Sage-Grouse-Preferred Forbs in Central Washington is Greater in Uplands than Mesic Areas" – Linnea Howard, Emily Korf; *Dr. Grant Casady, Whitworth University*
- A-19 "Designing a Multi-Access Key for Central and Western African Snakes" – Eric Hsu; *Dr. Kate Jackson, Whitman College*
- A-20 "Investigations of Fur Loss in Urban Yellow-Bellied Marmots" – Charlie Kittridge; *Dr. Elizabeth A. Addis, Gonzaga University*
- A-21 "Forest Canopy Cover Adjacent to Forest Roads and its Effect on Invasive Plants" – Beth Lewis; *Dr. Sherry Wood, Gonzaga University*
- A-22 "Scotch Broom Pollinators Vary in Size and Biodiversity along an Elevation Gradient" – Danner Linhart; *Dr. Bode, Saint Martin's University*
- A-23 "Moss Composition Affects Seedling Density of Western Hemlock and Sitka Spruce" – Katy Maleta; *Dr. Carrie Woods, University of Puget Sound*
- A-24 "Community Dynamics and Management of Invasive Perennial Grasses using Mowing and Prevention of Grazing in Garry Oak Meadows over 7 Years" – Joy Marconato, Emily Gonzales (University of Victoria); *Dr. David Clements, Trinity Western University*
- A-25 "Environmental Controls on Primary Producers in an Oregon Estuary" – Cristiana Matteucci, Frances Turner; *Dr. Christine Weilhoefer, University of Portland*
- A-26 "Abundance of Invasive Weed Species at Differing Elevations in the Coeur d'Alene National Forest" – Brian Muegge; *Dr. Sherry Wood, Gonzaga University*
- A-27 "Rangewide Multilocus Phylogeography of Pygmy Shrews (*Sorex hoyi*)" – Sarah Mueller; *Dr. Andrew G. Hope (Kansas State University), University of Puget Sound*
- A-28 "Investigation of disease susceptibility of midwest cereal lines" – Anna Muhich; *Pablo Gonzales and Dr. Lucia Gutierrez (University of Wisconsin-Madison), Gonzaga University*
- A-29 "Species Contributions and Abiotic Factors Provide a Detailed Characterization of *Campanula scouleri's* (*Campanulaceae*) Ecological Niche" – Michaela R. Myers, Jacynnda A. Woodman-Ross; *Dr. Rosemarie C. Haberle, Pacific Lutheran University*
- A-30 "Determining the Effect of Purging in Mixed-Mating Populations of *Mimulus Guttatus*, The Common Yellow Monkeyflower" – Toshiro Newsum; *Dr. Vanessa Koelling, University of Puget Sound*
- A-31 "Comparative Phylogeography of Three Lizards on the Channel Islands" – Tom Nguyen, Jeanne Robertson (Cal State University, Northridge), Greg Pauly (Los Angeles County Natural History Museum), Chris Funk (Colorado State University); *Dr. Lauren Chan, Pacific University*
- A-32 "How Changes in Plant Community Structure Affect Terrestrial Invertebrate Food Webs" – Jack O'Keefe, Renee LaFountain, Jack O'Keefe, Kathy Trinh; *Dr. Chad Tillberg, Linfield College*



- A-33 "Associational Effects of Olfactory cues on *Leptinotarsa juncta* Herbivory" – Esteban Olea; *Dr. Stacey Halpern, Pacific University*
- A-34 "The influence on nurse logs on seedlings and trees in temperate rainforests" – Kimmy Ortmann; *Dr. Carrie Woods, University of Puget Sound*
- A-35 "Effects Of Ecological Conditions On *Culex Tarsalis* Mosquitos And Their Ability To Remain Competent Vectors Of The West Nile Virus" – Paige Plancich; *Dr. Grant Hokit, Carroll College*
- A-36 "Does Elevation affect Flower Size or Pollination in *Cytisus scoparius*?" – Emily Prall; *Dr. Bode, Saint Martin's University*
- A-37 "Isolation and Characterization of a Large Intron-Involved in the Regulation of Plant Reproductive Organ Development" – Tucker Price; *Dr. Michael Zanis, Seattle University*
- A-38 "Bioacoustical Analyses of Vocalizations of *Diasporus vocator* (Vocal Dink frog) from Costa Rica" – Austin Reich; *Dr. John Cossel, Northwest Nazarene University*
- A-39 "Moss Versus the Volcano: Bryophyte Responses to the 1980 eruption of Mount St. Helens" – Stella Scheel; *Dr. Dylan Fischer, The Evergreen State College*
- A-40 "MHC Diversity in Relation to Sexual Selection in the Acorn Woodpecker" – Phoebe Seaver; *Dr. Joseph Haydock, Gonzaga University*
- A-41 "Using Stable Isotopes to Determine Resource Partitioning and The Role of Anthropogenic Food Sources on Urban Populations of Seattle and North Tacoma Raccoons and Opossums" – Mairan Smith; *Dr. Peter Wimberger and Dr. Kena Fox-Dobbs, University of Puget Sound*
- A-42 "Population Genetics and Molecular Ecology of the Green Algae *Micrasterias fimbriata* and *Micrasterias rotata* (Desmidiaceae) in the Pacific Northwest" – Brittany Takushi; *Dr. Michael Zanis, Seattle University*
- A-43 "Macroevolutionary Diversity of the Green Algae *Micrasterias* (Desmidiaceae) Across the Cascadian freshwater Ecosystems" – Selyna Villareal; *Dr. Michael Zanis, Seattle University*
- A-44 "Analysis of Candidate Genes for the Gain and Loss of Anthocyanin Pigmentation in *Mimulus cupreus*" – Anne Vonada; *Dr. Arielle Cooley, Whitman College*
- A-45 "Does variation in Light Environments Influence Tree Seedling Biodiversity in an Amazonian Rainforest?" – Ina Waring-Enriquez; *Dr. Margaret Metz, Lewis & Clark College*
- A-46 "Using Deuterium-Enriched Sucrose Solution to Measure the Energetic Importance of Artificial Feeders for Hummingbirds" – Nathan Weston; *Dr. Don Powers, George Fox University*
- A-47 "Do Zebra Finches Recognize the Odors of their Mates?" – Katherine Woodruff; *Dr. Christopher Templeton, Pacific University*
- A-48 "A Functional Ecological Comparison of Three Sponge Species from the Lower Florida Keys" – Clara Prentiss, Tyler Griffin, Carmen Hoffbeck; *Dr. Jeremy Weisz, Linfield College*



POSTER B - DEVELOPMENTAL BIOLOGY / PHYSIOLOGY

- B-1 "Wnt5a and APT1 Regulate Protein Depalmitoylation during Zebrafish Convergent Extension and Gastrulation" – Phillip Bax; *Dr. Aaron Putzke, Whitworth University*
- B-2 "Impact of Akap200 Mutations on Septate Junction Proteins During Frizzled-Independent Planar Cell Polarity in the *Drosophila* Wing Epithelium" – Madelaine Beckett, Thalia Wiens, Donovan Sneddon, Laura de la Giroday; *Dr. Dennis Venema, Trinity Western University*
- B-3 "Retinal Development in the Absence of Blood Circulation in the Zebrafish" – Jennifer Blackerby, Josie Sejd (University of Idaho); *Dr. Deborah Stenkamp (University of Idaho), Gonzaga University*
- B-4 "The Effect of *Zingiber officinale* on T-cell Proliferation in mice" – Jodi Callwood, Matthew Moran; *Dr. Joan Redd, Walla Walla University*
- B-5 "Octopuses on Acid: mRNA Expression and Ocean Acidification" – Monica Culler, Katherine Pekar; *Dr. Kirt Onthank, Walla Walla University*
- B-6 "Neurodevelopmental Toxicity of Low Concentration Silver Nanoparticles in Embryonic Zebrafish (*Danio rerio*)" – Tyler Hemphill; *Dr. Jerry Harris, Northwest Nazarene University*
- B-7 "A Systematic Review and Meta-Analysis of the Effect of Hormonal Changes on ACL Injuries in Women" – Simone Herzberg, Makalapua L. Motu'apuaka, Dr. William Lambert, Dr. Rochelle Fu, Dr. Jacqueline Munch; *Dr. Jeanne-Marie Guise, Seattle Pacific University*
- B-8 "Effect of *Wolbachia* on Reproductive Output of Field Collected *Drosophila melanogaster*" – Mallory Hiefield, Kelsey Lee; *Dr. Joanne Odden, Pacific University*
- B-9 "Early High Fat Diet Exposure Impacts the Dopamine System and Food Motivation in Non-Human Primates" – Cassandra Kasten-Arias; *Dr. Elinor Sullivan, University of Portland*
- B-10 "Blocking Funny (HCN) Ion Channels with ZD7288 Slows *Daphnia* Heart Rate" – Tanisha Khurana, Troy Carr; *Dr. Thomas Pirtle, College of Idaho*
- B-11 "Impact of High-Fat-Diet-Induced Nonalcoholic Fatty Liver Disease on Cardiac Physiology" – Alanna McCarthy; *Dr. Stephen Luckey, Seattle University*
- B-12 "Amphibian Risk Assessment" – Alex Kurtz; *Dr. Brandon Sheafor, Carroll College*
- B-13 "Impact of Physiological and Pathological Stimuli on the Aging Heart" – Nathan McLaughlin; *Dr. Stephen Luckey, Seattle University*
- B-14 "Genetic Screening in *Drosophila Melanogaster* Classifies Mutations as Resistant or Sensitive to Nicotine" – Madison Lambert, Ariel Shaw, Madison Lambert; *Dr. Norma Velazquez-Ulloa, Lewis & Clark College*
- B-15 "Prevalence of *Wolbachia* Infections in Colorado Mosquitoes and Phylogenetic Analysis of *Wolbachia*" – Kelsey Lee, Mallory Hiefield; *Dr. Joanne Odden, Pacific University*



- B-16 "Effect of Maternal Obesity on Expression of Carnitine palmitoyltransferase 1A (CPT1A) in the Human Placenta" – Brook Mengistu; *Dr. Alina Maloyan, Warner Pacific College*
- B-17 "Assay of Exosome Mirna as Minimally Invasive Biomarkers for AML" – Michael Morin; *Dr. Peter Kurre, Linfield College*
- B-18 "Voluntary Exercise Enhances Cardiac Growth in Response to Chronic β - Adrenergic Receptor Stimulation" – Moira O'Connor Lenth; *Dr. Stephen Luckey, Seattle University*
- B-19 "Do Cardiac Nerves Promote Endocardial Endothelial Dysfunction in Heart Failure Patients?" – Leslie Perez-Cervantes; *Dr. Wohaib Hasan, Linfield College*
- B-20 "Does Exercise and/or Viagra Rescue Fetal Growth Restriction?" – Ashley Peterson; *Dr. Jim Smart and Dr. Terry Morgan, George Fox University*
- B-21 "Nicotine Development and Cross Resistance in *Drosophila melanogaster*" – Ariel Shaw, Hamsat Anwar, Madison Lambert; *Dr. Norma Velazquez Ulloa, Lewis & Clark College*
- B-22 "Dominant Effects of an Akap200 Insertion Mutation on Gliotactin Hypomorphic Genotypes With Defects in Frizzled-Independent Planar Cell Polarity" – Donovan Sneddon, Thalia Wiens, Madelaine Beckett, Laura de la Giroday; *Dr. Dennis Venema, Trinity Western University*
- B-23 "The Effects of the Monoamine Neurotransmitters, Dopamine and Serotonin, on Daphnia Heart Rate" – Florence Wavreil, Reilly Coyle, Hailey Boyd, Tanisha Khurana, Troy Carr; *Dr. Thomas Pirtle, College of Idaho*
- B-24 "Identifying Homologs of Notch Signaling Pathway Genes in the Tardigrade *Hypsibius dujardini*" – Braeden Wiebe; *Dr. Jenny Tenlen, Seattle Pacific University*



POSTER C - MOLECULAR AND CELL BIOLOGY

- C-1 "Analyzing T Cell Phenotypes in Chronic Graft-Versus-Host Disease After Naive T Cell-Depleted Hematopoietic Stem Cell Transplantation" – Cora Amundson, Nick Culores, Dr. Marie Bleakley (Fred Hutchinson Cancer Research Center); *Dr. Matt Craig, Whitman College*
- C-2 "Molecular Quantification of Dissimilatory Arsenic-Reducing Bacteria Within Arsenic-Contaminated Sediments of The Spokane River" – John Andrianu; *Dr. Aaron Putzke, Whitworth University*
- C-3 "Protein interactions of F-BOX STRESS INDUCED 1" – Meghan Bacher; *Dr. Bryan Thines, University of Puget Sound*
- C-4 "Natural Vertical Transmission of the WNV in Montana" – Inderbir Bains; *Dr. Sam Alvey, Carroll College*
- C-5 "F-BOX STRESS-INDUCED 1: A novel circadian clock gene in Arabidopsis thaliana" – Joe Chen, Elena Fulton; *Dr. Bryan Thines, University of Puget Sound*
- C-6 "Calcium Control of Cancer Cell Growth Requires TRP Channel 6" – Morgan Bars; *Dr. John Schmitt, George Fox University*
- C-7 "Genomic Analysis: Computational Approaches to the Determination of Genomic Structure and Function" – Anna Belford; *Dr. Samuel Fox, Saint Martin's University*
- C-8 "The Effect of an Over the Counter Echinacea Extract on Macrophage Function" – Naomi Bryant, Catherine Treichel; *Dr. Gabrielle Stryker, Central Washington University*
- C-9 "Application of exogenous Angiotensin II induces a Warburg-type phenotype in cultured LNCaP prostate epithelial cells" – David Degnan; *Dr. Jeffrey Duerr, George Fox University*
- C-10 "Genetic Screening for Hydrogen Producing Algae" – Mauri Erickson, Kayla Moreno, Faith Robichaud; *Dr. Mark Osterlund, Rocky Mountain College*
- C-11 "The Generation of Recombinant Metalloproteinase of Clostridium sordellii-1 (Mcs1) Utilizing an Escherichia coli Expression Host System" – Kevin Field; *Dr. Mike Aldape, Northwest Nazarene University*
- C-12 "Identification and Characterization of Vasa Homologs in the Tardigrade *Hypsibius dujardini*" – Shamil Hasanov, Sierra Sanders; *Dr. Jennifer Tenlen, Seattle Pacific University*
- C-13 "Effect of the Phthalate, Butyl benzyl Phthalate (BBzP) on Viability of Neuro 2a Cells" – Veronica Hernandez, Natalie Bergstrom, Hannah Dowdell; *Dr. Lucinda Carnell and Dr. April Binder, Central Washington University*
- C-14 "A Positive Responding Plant Hormone Biosensor Utilizing Fluorescence" – Ben Herried; *Dr. Britney Moss, Whitman College*
- C-15 "Factors Affecting Maintenance of Homing Endonuclease Activity" – Chris Hughes; *Dr. Brett Kaiser, Seattle University*



- C-16 "Abnormal Brain Lipid Transport and Metabolism in Cognitive Impairment and Dementia in Elderly with Diffuse White Matter Disease" – Parkes Kendrick; *Dr. Randall Woltjer, University of Portland*
- C-17 "Exploring Swiss Cheese function and its Effect on Ca²⁺ Homeostasis" – Sadie Krahn, Elizabeth Sunderhaus (Oregon Health and Science University), Dr. Doris Kretzschmar (Oregon Health and Science University); *Dr. James Smart, George Fox University*
- C-18 "Extracellular Melanin for Neuronal Protection from Oxidative Stress" – Jonathan Lindsey; *Dr. Janice McKenzie, Walla Walla University*
- C-19 "Genetic Differentiation among *Culex tarsalis* Populations in Montana" – Dan Lockman; *Dr. Jennifer Glowienka, Carroll College*
- C-20 "Exploring a Novel Tool for Engaging B Cell Receptors for Use in Vaccine Development" – Anne Macy, Tara Bancroft, Junli Feng, Matthew Gray; *Dr. Justin Taylor, Seattle Pacific University*
- C-21 "Establishing IRAK-1 as a Novel Therapeutic Target in Leukemia and Lymphoma" – Bernadette Maertens; *Dr. Anupriya Agarwal (Oregon Health and Science University) (Murdock Scholars Program), Lewis & Clark College*
- C-22 "The Effect of Sucrose Consumption on Hepatic Gene Expression" – Shaina Miller; *Dr. Sarah Comstock, Corban University*
- C-23 "Calcineurin Inhibits Estrogen-activation of CaM Kinases and Cell Growth" – Lael Papenfuse; *Dr. John Schmitt, George Fox University*
- C-24 "Identifying Metabolic Heterogeneity in Pancreatic Cancer Cells using Fluorogenic Probes" – Claire Pillsbury; *Dr. Kimberly Beatty, Pacific University*
- C-25 "Unique Solutions to a Common Problem: Understanding How I-CreI Homologs Recognize the Same DNA Target Sequence" – Caley Polkinghorn, Nathan Wylie; *Dr. Brett Kaiser, Seattle University*
- C-26 "Antiviral Properties of Black Elder (*Sambucus nigra L.*)" – Randall Porter; *Dr. Bode, Saint Martin's University*
- C-27 "Epigenetics of Host-Pathogen Interaction: the Case Study of *Agrobacterium tumefaciens* C58" – Genny Roberts; *Dr. Derek Wood, Seattle Pacific University*
- C-28 "A Role for Micrnas in Regena/NOT2-Dependent Gene Silencing" – Hayden Rock; *Dr. Catherine Reinke, Linfield College*
- C-29 "EPRS and BEX-1 Binding Domains: Troubleshooting Co-immunoprecipitations" – Robin Rounthwaite, Patrick Wright, Jennifer Petrosino, Federica Accornero; *Dr. Jim Russo, Whitman College*
- C-30 "HCMV Seropositivity Affects Regulatory T-Cell Phenotypes" – Lavinia Sagario, Ann Hill; *Dr. Susan E. Murray, University of Portland*



- C-31 "Does a Novel Allele of Regena/NOT2 Disrupt Gene Silencing?" – Cami Soriano, Tika Zbornik; *Dr. Catherine Reinke, Linfield College*
- C-32 "ILK Regulates Cancer Cell Survival in an Rb-Dependent Manner" – Jacqueline Tan; *Dr. Julia Mills, Trinity Western University*
- C-33 "Investigation of Susceptibility to Cataract Development in An Obese Mouse Model" – Calvin Vetter; *Dr. Sarah Comstock, Corban University*
- C-34 "Optimizing Parameters for Electrospinning Polyurethane Nanofiber Scaffolds for the Application of Neural Tissue Engineering" – Natalie Wolske; *Dr. Janice McKenzie, Walla Walla University*
- C-35 "Activation of Dendritic Cells by CPG Bound Nanoparticles for Cancer Immunotherapy" – Ashley Widmer; *Dr. Max Kullenberg, University of Alaska Anchorage*
- C-36 "Pathways for Natural Killer Cell Immunotherapy to Eliminate Latent HIV" – Priscilla Louise Natcher; *Dr. Eric Bortz, University of Alaska Anchorage*
- C-37 "The Relationship Between Thyroxine (T4) Content and Kidney Histomorphology in Threespine Stickleback Perchlorate (ClO₄⁻) Exposure" – Chelsea Paroccha; *Dr. Frank von Hippel, University of Alaska Anchorage*
- C-38 "Evaluation of 16s Bacterial Gut Consortia from *Bombus Impatiens* using a Modified AFLP Analysis" – Kaylee Perich, Sabra Dunakey, Kiley Cordero, Alexandra Horn; *Mr. Randall S. James, Institute of Science and Technology, North Central High School, Spokane, Washington*
- C-39 "Analysis of Novel Glutenase Genes Found in Wheat Consuming Arthropods to find Potential Therapeutic Uses for Celiac Disease" – Kendall Bart, John Shuster, Sean Flannery, Marie Chapman; *Mr. Randall S. James, Institute of Science and Technology, North Central High School, Spokane, Washington*
- C-40 "Analysis of *Pisaster ochraceus* for Maladaptive mtDNA Mutations and Links Between Sea Star Wasting Disease and Increased Ocean Temperatures" – Matthew Mickey, Michael Kron, Ryan Leaming; *Mr. Randall S. James, Institute of Science and Technology, North Central High School, Spokane, Washington*



POSTER D - NEUROSCIENCE / PSYCHOLOGY / EXERCISE SCIENCE

- D-1 "Bilingualism and Executive Functions: Is there a Bilingual Advantage over Monolinguals on Cognitive Control?" – Sophia Aron, Gabriella Tost; *Dr. Yueping Zhang, Lewis & Clark College*
- D-2 "Diabetic Neuropathy on Knee Joint Position Sense" – Ami Boucher; *Dr. Lucas Ettinger, Willamette University*
- D-3 "Separating Color and Motion: Leveraging Spectral Sensitivity to Study Bumblebee Flight Control" – Kristina Chaffee; *Dr. Jonathan Dyhr, Northwest University*
- D-4 "What GABA Receptors are Expressed in the Zebrafish Lateral Line?" – Yangchen Tenzi, Kyler Hayes, Connell Crabtree; *Dr. Cecilia Toro, Linfield College*
- D-5 "Visualization of Putative Synapses between Interneurons VD4 And Lped1 of the Pond Snail Lymnaea Stagnalis using Dual Fluorescent Dye Labeling" – Cori Domes, Aimee D. Sokol, Ashley N. Blair; *Dr. Richard L. Ridgway, Seattle Pacific University*
- D-6 "Determining the LKB1 Interactome" – Brecken Esper, Vira Tsintsadze, My Linh Nguyen, Biliana Veleva-Rotse, Anthony P. Barnes (Oregon Health & Science University); *Dr. James Smart, George Fox University*
- D-7 "The Antibiotic Minocycline Attenuates Paraquat-Induced Locomotor Deficits and its Uptake into Brain Tissue in an Animal Model of Parkinson's Disease in Bumblebees (*Bombus impatiens*)" – Adam Herbertson; *Dr. Sue Hannaford, University of Puget Sound*
- D-8 "Are there Sex Differences in the Developing Brain?: Effects of Pre-Natal Testosterone Administration on the Number of Dopamine and Serotonin Neurons" – Katie King, Nicole Stucky; *Dr. Mark R. Pitzer, University of Portland*
- D-9 "Biology Underlying Prosociality: Resilience and Posttraumatic Growth and their Relationship to Moral Elevation" – Krizchelle Magtoto; *Dr. Sarina Saturn, University of Portland*
- D-10 "Virtual Map Interface Increases Daily Steps for Activity Tracker Users" – Blake Murray, Andres Cortes, Arianna Marshank, Willow Wood, Jeremy McWilliams; *Dr. Erik Nilsen, Lewis & Clark College*
- D-11 "Investigations of Behavior and Physiology in a Mouse Model of PCOS" – Raegan Nelson, Carolina Montenegro; *Dr. Kara I. Gabriel and Dr. April K. Binder, Central Washington University*
- D-12 "Investigating the Role of DNC-2 and DLI-1 in AMPA Receptor Mediated Behaviors in *C. elegans*" – Natalie Oberding; *Dr. Stefanie Otto-Hitt, Carroll College*
- D-13 "Exploring the Relationship Between 'Intuitive' Eating and the Neurocognitive Correlates of Food Cue Processing in Adults and Young Children" – Elvira Ruan, Roxanne Felig, Lanie Grimm; *Dr. Todd D. Watson, Lewis & Clark College*
- D-14 "Sex Differences in Leptin-induced Increases in Sympathetic Nerve Activity: The Role of Brain Microglia" – Whitney Sia; *Dr. Virginia Brooks (Oregon Health & Science University), Willamette University*
- D-15 "Extracellular Matrix Breakdown Blocks Repair and Regeneration Following Preterm Brain Injury" – Rachel Siltman; *Dr. Stephen Back (Oregon Health & Science University), Concordia University*



- D-16 "Testing for Sociability and Novelty in a Mouse Model of Autism" – Taylor Wintler, Kristan Singletary (Washington State University Spokane); *Dr. Peixoto (Washing State University Spokane); Dr. Lucia Peixoto, Gonzaga University*
- D-17 "Predictors of Child Sexual Abuse Myth Endorsement among Alaskan University Students" – Maia Wen; *Dr. Rebecca Robinson, University of Alaska Anchorage*



POSTER E - BIOCHEMISTRY

- E-1 "Elucidating the Biosynthetic Pathway of Rhodoquinone in *C. elegans*" – Shannon Babcock; *Dr. Jennifer Shepherd, Gonzaga University*
- E-2 "Proximate Analysis of Fish Food and Fish: Are You Really What You Eat?" – Paige Bodner; *Dr. John Baluyut and Dr. S. Diane Lund, University of Great Falls*
- E-3 "Investigating the Structure and Redox Properties of a Monoheme Cytochrome c Using Two Site-Directed Mutant" – Evelyn Bordeaux; *Dr. Katie Frato, Seattle University*
- E-4 "Radical Enzymes Involved in Compatible Solute Synthesis in Methanogens" – Sarah Byquist; *Dr. Kylie Allen, Gonzaga University*
- E-5 "Cloning and Characterization of Radical SAM Enzymes" – Allie Cloud, Kylie Konrath; *Dr. Rachel Hutcheson, University of Portland*
- E-6 "Investigating the effects of purine nucleotides on the structure and function of *Burkholderia cenocepacia* HMG-CoA reductase" – Tara Cristallo; *Dr. Jeff Watson, Gonzaga University*
- E-7 "Purification and Kinetic Analysis of Alcohol Dehydrogenase 22 isoform" – Nico Haragos; *Dr. Jennifer Chase, Northwest Nazarene University*
- E-8 "Exploring the Effects of Suicide Inhibition on *Burkholderia cenocepacia* HMG-CoA Reductase" – Alexandra Cumings; *Dr. Jeff Watson, Gonzaga University*
- E-9 "Examining the Effect of Insulin on the Membrane Association of Islet Amyloid Polypeptide" – Elizabeth Hegedus; *Dr. Megan Gessel, University of Puget Sound*
- E-10 "Maximizing Botryococcene Production in *Escherichia coli*" – Tyler E. Johnson, Sara R. Newman; *Dr. Jon O. Freeman, Pacific Lutheran University*
- E-11 "Genetic Engineering of the Rat CYP4A1 Gene for Overexpression in a Bacterial System" – Casey Johnston; *Dr. Jeannine Chan, Pacific University*
- E-12 "Tor1 and Yeast Longevity via Chronological Lifespan Assay" – Amelia Keyes; *Dr. Megan Bestwick, Linfield College*
- E-13 "Identification of Stem-Loop Motifs in the Secondary Structure of RNA" – Elizabeth Knodel, Wade Grabow; *Dr. Daniel Schofield, Seattle Pacific University*
- E-14 "In Vitro Analysis of the Thyroid Hormone Receptor in Mitochondrial Transcription" – Dylan Legrady; *Dr. Megan Bestwick, Linfield College*
- E-15 "The Effect of Deleting the Gene Rru_A2553 on Rhodoquinone Biosynthesis in *Rhodospirillum rubrum*" – Amanda Martin; *Dr. Jennifer Shepherd, Gonzaga University*



- E-16 "Kinetic studies of Cu(I) metalloproteins using Rapid Freeze Quench XAS" – Zachary Mathe, Ethan Ho and Jonathan Perkins, Ninian Blackburn (Oregon Health & Science University); *Dr. Kelly Chacón, Reed College*
- E-17 "Characterization of a Novel RNA Tertiary Interaction Found in THF Riboswitches" – Charles Mitchell, Lauren DeWald, Dustin Kress; *Dr. Wade Grabow, Seattle Pacific University*
- E-18 "Inhibition of CYP2A6 as a Smoking Cessation Aid" – Ghina Moyeen; *Dr. John Harrelson and Dr. Jeannine Chan, Pacific University*
- E-19 "Thermodynamic and Redox Properties of a c-type Cytochrome from the Diatom *T. pseudonana*" – Saveeta Rampur; *Dr. Katie Frato, Seattle University*
- E-20 "Examining the Mechanism of Binding Between Blood Coagulation Factor VIII and Von Willebrand Factor" – Mikko Sayre; *Dr. Paul Spiegel, Western Washington University*
- E-21 "Nanostructured Polymer Lithography for Electronic Applications" – Lydia Steiner; *Dr. Jerry Harris, Northwest Nazarene University*
- E-22 "Mass Spectrometry Analysis of Islet Amyloid Polypeptide in Model Membrane" – Samantha Swain; *Dr. Megan Gessel, University of Puget Sound*
- E-23 "Studying the Inhibitory Effect of Quercetin and Thymoquinone on Human Cytochrome P450 Enzyme Activities" – Aimy Ung, Mai Vo; *Dr. Fawzy Elbarbry, Pacific University*
- E-24 "Role of Copper and Tor Signaling in Reactive Oxygen Species Induced Cell Aging" – Matthew Walser; *Dr. Megan Bestwick, Linfield College*
- E-25 "Hyaluronidase Inhibition of Flavonoids from the Rhododendron Flower" – Rebecca Wetzel; *Dr. Angela Hoffman, University of Portland*
- E-26 "P14 Specificity for Shared Structures of miRNA and siRNA" – Aliya Whitehill; *Dr. Jeff Vargason, George Fox University*
- E-27 "Quantification of In Vitro Transcription RNA Products Using Ion-Pair Reverse Phase Liquid Chromatography" – Henry Wienkers; *Dr. Megan Bestwick, Linfield College*
- E-28 "Overexpression and Characterization of the rquA Gene Product Involved in the Biosynthesis of Rhodoquinone" – Alison Zander; *Dr. Jennifer Shepherd, Gonzaga University*
- E-29 "Polycyclic Aromatic Hydrocarbons in Arctic Waters Using Fluorescence Spectroscopy" – Adrienne Driskill; *Dr. Jennifer Burns, University of Alaska Anchorage*



POSTER F - ORGANIC CHEMISTRY

- F-1 "Synthesis of Lactate Racemase Model Complex to Investigate Catalytic Hydride Transfer Capability" – Janna Berman; *Dr. Benjamin R.J. Mueller (Vanderbilt University) and Dr. Nathan D. Schley (Vanderbilt University), University of Puget Sound*
- F-2 "Synthesis, Chemical Reactivity, and Medicinal Activity of Novel Chiral Piperidines" – Hannah Braunstein; *Dr. Timothy K. Beng and Dr. Blaise Dondji, Central Washington University*
- F-3 "Development of New Drugs as Potential Treatment for Eye Disease" – Claire DeAngeli, Sophia Wax; *Dr. Sarah Kirk, Willamette University*
- F-4 "Alternative Synthesis of Antimalarial 2-Hydroxy-1,4-naphthoquinones Containing 3-Alkyl-diphenylether Side Chains" – Maddie Deem; *Dr. Warren J. L. Wood, University of Portland*
- F-5 "Lewis Acid Catalyzed Friedel-Crafts Addition of Donor-Acceptor Cyclopropanes" – Rebecca A. Doud; *Dr. Eric E. Finney, Pacific Lutheran University*
- F-6 "Two Prodrug Strategies for the Delivery of Carboxylic Acid-Containing Pharmaceuticals by a Retro-Diels-Alder Reaction" – Kaitlin N. Gardiner; *Dr. Neal A. Yakelis, Pacific Lutheran University*
- F-7 "Synthesis of Bent Core Liquid Crystalline Compounds in an Effort to Lower the Observed Phase Transition Temperatures" – Ryan Grate; *Dr. Eric Scharer, University of Puget Sound*
- F-8 "Synthesis of a Dicavitand through Pendant Alcohol Foot-to-Foot Linkage" – Elliott J. Peterson; *Dr. Neal A. Yakelis and Dr. Jon O. Freeman, Pacific Lutheran University*
- F-9 "Improving the Efficiency and Accuracy of Molecular Modeling Through the use of Natural Orbitals" – Matthew Gschiel; *Dr. Gergely Gidofalvi, Gonzaga University*
- F-10 "Thymine Dimer Formation Probability Using Molecular Dynamics Simulations" – Emily Heinsen; *Dr. Andrew Johnson, Concordia University*
- F-11 "The Vibrational Spectra of Potential Atmospheric Aerosol Precursors" – Emma Honeyman; *Dr. Daniel Schofield, Seattle Pacific University*
- F-12 "Characterization of the MalA Enzyme from *Bdellovibrio bacteriovorus* through the Synthesis and Analysis of Maltose Derivatives" – Joey Jepson; *Dr. John Hanson, University of Puget Sound*
- F-13 "UV Irradiation of Thymine Molecules and Gas Chromatography Mass Spectrometry" – Kelsey Mauk; *Dr. Andrew Johnson, Concordia University*
- F-14 "Facile Synthesis of Thermoresponsive Biodegradable Polymers for Drug Delivery Applications" – Aidan Morrell; *Dr. Jing Hao, George Fox University*
- F-15 "Rotation of Benzofulvenes' Exocyclic Double Bond Effects on Conjugation via Various Substituents" – James C. Okubo; *Dr. Adam C. Glass, Pacific Lutheran University*



- F-16 "Chemoenzymatic Total Synthesis of Epoxyquinol A" – Deepraj Pawar, Jonathan Collins, Samuel Erickson, Brad Kline, Isaac Sappington; *Dr. Jon Collins, Whitman College*
- F-17 "Synthesis of Substituted Nitrosoguanidine Diels-Alder Adducts and Study of Retro Diels-Alder Rate" – Miles N. Radford; *Dr. Neal A. Yakelis, Pacific Lutheran University*
- F-18 "Progress Toward a Novel Synthesis of a Glycosylated Amino Acid" – Katie Rykaczewski; *Dr. Joe Langenhan, Seattle University*
- F-19 "Progress Towards the Synthesis of 2-Acylated-3-hydroxy-1,4-naphthoquinones" – Alyson Sillin; *Dr. Warren J. L. Wood, University of Portland*
- F-20 "Lewis-acid Catalyzed Cycloaddition Microwave Reaction of Trimethylallylsilane with Donor-Acceptor Cyclopropanes" – Madeline I. Smith; *Dr. Eric E. Finney, Pacific Lutheran University*
- F-21 "Porous Organic Frame Works for Photoredox Catalysis" – Caleb Thompson, Jingzhi Lu; *Dr. Jian Zhang, Seattle Pacific University*
- F-22 "Synthesis of a Perylenebisimide Ligand for Improving the Light Absorption Properties of Luminescent Solar Concentrators" – Heather Towns; *Dr. R. Carlisle Chambers, George Fox University*
- F-23 "An Investigation of Acyl Anion Chemistry" – Cooper Vincent, Greg Hunt; *Dr. Stephen Warren, Gonzaga University*
- F-24 "Towards Supramolecular Catalysis via Cucurbit[8]uril and a Transition Metal Cofactor" – Curt Wong; *Dr. Masaomi Matsumoto, Gonzaga University*
- F-25 "Synthesis of Functional Poly(Valerolactone) via Post-Polymerization Modification" – Asteria Yiu; *Dr. Jing Hao, George Fox University*



POSTER G - ANALYTICAL / INORGANIC / PHYSICAL ORGANIC / COMPUTATIONAL CHEMISTRY

- G-1 "Effect of ZnO nanoparticle morphology on photodegradation of Janus Green B azo dye" – Hannah Anderson; *Dr. Jerry Harris, Northwest Nazarene University*
- G-2 "Developing Fluorescent Rhenium Tricarbonyl Dihydroxyphenanthroline Complexes" – Jessica Baumgartner; *Dr. Kerry Breno, Whitworth University*
- G-3 "Optimization and Characterization of Membrane Scaffold Protein Purification" – Benedict Beam; *Dr. Eric Ross, Gonzaga University*
- G-4 "Synthesis and Properties of Cyanine Dye and Anthracenyl Molecules When Paired with Thienyl Groups" – Nate Burman; *Dr. John Rowley, Carroll College*
- G-5 "Quantification of Saponins and ASOGs in Fruits of *Sapindus saponaria*" – Ramon Carranza, Mikayla Swirski; *Dr. Paul Brown, Trinity Western University*
- G-6 "Nanocrystals as Dyes for Luminescent Solar Concentrators" – Darick G. Chai, Ciara G. Flanery; *Dr. Andrea M. Munro, Pacific Lutheran University*
- G-7 "Investigation of Ionic Conductivity of Novel Polymers for Use as Electrolyte Supports for Lithium Ion Batteries" – Christien M. Chandler; *Dr. Dean A. Waldow, Pacific Lutheran University*
- G-8 "Computational Modeling of Surfactants at the Oil-Water Interface" – Kjersti Chippindale, Chris McCormick; *Dr. Kevin Johnson, Pacific University*
- G-9 "The Effects of Water Column pH And Temperature on Phosphorus Sorption Of Sediments" – Dustin Dillon; *Dr. William Ntow, Whitworth University*
- G-10 "One Stone, Two Birds: Simultaneous Oxidative Dehalogenation and Transesterification Reactions on Phosphonate-appended 2,5-Dichloroquinone" – Timothy Dobson; *Dr. Edward J. Valente and Dr. Eugene Urnezius, University of Portland*
- G-11 "Design and Synthesis of an Artificial Enzyme: A Molecular Imprinted Polymer that Mimics Zinc Containing Hydrolytic Enzymes" – Bijoux Doherty; *Dr. Joel Gohdes, Pacific University*
- G-12 "Examination of Substrate Specificity of PcpA by Characterization of MnpC, a Putative Hydroquinone Dioxygenase" – Jane Duncan, Emma Altman; *Dr. Tim Machonkin, Whitman College*
- G-13 "Optimization of the Synthesis of Tetraethylammonium Tricarbonyl (hydridotripyrazoylborato) molybdenum(0)" – Jacob M. Finney; *Dr. Eric E. Finney, Pacific Lutheran University*
- G-14 "Synthesis of Molybdenum, Copper active site of Carbonmonoxide Dehydrogenase" – Marc Foster, Ethan Gladhill; *Dr. Dalia Rokhsana, Whitman College*
- G-15 "Novel Natural Gas Compressor: Interactions between water and natural gas contaminants" – Daisy Gallegos, NW Natural, University of Portland; *Dr. Davida Brown, George Fox University*



- G-16 "Synthesis and purification of Au:Ag core shell nanoparticles with 4-aminothiophenol SERS tag" – Madison Gladding, Tori Wood, Christopher Munjar, Allison Smith; *Dr. Brian Gilbert, Linfield College*
- G-17 "Investigation of Multi-Objective Optimization Criteria for RNA Design" – David Hampson, Sinem Sav (Bilkent University, Turkey); *Dr. Herbert Tsang, Trinity Western University*
- G-18 "Modifying Carbon Electrodes to Behave Like Precious Metals" – Gabrielle E. Kamm, Ashlee D. McGovern; *Dr. Justin C. Lytle, Pacific Lutheran University*
- G-19 "Phosphorus Sorption of Sediments in the Little Spokane River Under Aerobic And Anaerobic Conditions" – Kateryna Kostenkova; *Dr. William Ntow, Whitworth University*
- G-20 "2,5-Dihydroxy- and 2,5-Diaminoquinones Appended with -P(O)R₂ Groups: Syntheses, Structures, and Electrochemical Studies" – Madison Lear; *Dr. Edward J. Valente and Dr. Eugene Urnezis, University of Portland*
- G-21 "Nanomorphology of Novel Synthesized Diblock Copolymers with and Without Lithium Salt Characterized by Atomic Force Microscopy" – Megan R. Longstaff; *Dr. Dean A. Waldow, Pacific Lutheran University*
- G-22 "Stabilization of DAPI in Base-catalyzed Sol-Gels Containing Silver Nanoparticles vs Solution Using SERS" – David Mason; *Dr. Elizabeth Atkinson, Linfield College*
- G-23 "Photodegradation of Bisphenol Derivatives with Gold-Loaded Titanium Oxide Nanoparticles" – Mackenzie McCausland; *Dr. Davida Brown, George Fox University*
- G-24 "Exploration of Pre-Transition Droplet Formation in Liquid-Liquid Binary Systems" – Makayla McKibben, Kayla Riley; *Dr. J. Charles Williamson, Willamette University*
- G-25 "Photolysis of Halogenated Estrogens" – Reid Milstead; *Dr. David Griffith, Willamette University*
- G-26 "Characterization of Water and Protein in Biogenic Aragonite in Scleractinian Coral" – Rintaro Moriyasu, Allison Calhoun, Doug Juers; *Dr. Jon Collins, Whitman College*
- G-27 "Characterization of Lipid Coated Gold, Silver and Gold-Silver Alloy Nanoparticles" – Christopher Munjar, Allison Smith, Madison Gladding, Tori Wood; *Dr. Brian Gilbert, Linfield College*
- G-28 "Effect of Calcium on Ligand Exchange Pathways" – Laura Rea; *Dr. Nate Boland, Whitman College*
- G-29 "Solar Cell -- Oxidative Dimerization" – Lauren Rhoda; *Dr. Caroline Pharr, Carroll College*
- G-30 "Surface Water Photochemistry: Pollutant Fate and Structure-Activity Relationships" – Johanna Rinaman; *Dr. Doug Latch, Seattle University*



- G-31 "Characterization of Lipid and Silver Coated BRIGHTs" – Allison Smith, Tori Wood, Madison Gladding, Christopher Munjar; *Dr. Megan Bestwick, Dr. Elizabeth Atkinson, and Dr. Brian Gilbert, Linfield College*
- G-32 "Nanostructured polymer lithography for electronic applications" – Lydia Steiner; *Dr. Jerry Harris, Northwest Nazarene University*
- G-33 "Investigation of Black Carbon in the Chilean Andes via In-situ Collection, Filtration, and VP-SEM analysis" – Emily Stewart; *Dr. Steven Neshyba, University of Puget Sound*
- G-34 "Estrogen Distributions at the Willow Lake Water Pollution Control Facility" – Logan Vine; *Dr. David Griffith, Willamette University*
- G-35 "XRF Analysis of Soil in the Roman City of Pollentia, Spain" – Elinor Wilson, Matthew Foronda, Gisela Gonzales-Montiel, Taylor Hudson; *Dr. Valerie Walters and Dr. Ronda Bard, University of Portland*
- G-36 "Coordination Chemistry of Hydrophosphoranes with Rh(I) and Pd(II)" – Vanessa Yap, Hannah Carroll, Noah Reich; *Dr. Craig Montgomery, Trinity Western University*
- G-37 "Characterizing the Glass Transition Temperature and Birefringence of select Oligo (ethylene oxide) Oxanorbornyl Diblock Copolymers and Homopolymers for Solid Electrolyte Supports" – Rodion A. Zhuravlev; *Dr. Dean A. Waldow, Pacific Lutheran University*



POSTER H - ENVIRONMENTAL SCIENCE / GEOLOGY

- H-1 "Improving Interpretations of Delta 34 S Pyrite with Isotopic Measurements of Individual Pyrite Framboids" – Elliot Bullen, Lara Shinsato; *Dr. Katja Meyer, Willamette University*
- H-2 "Controls on the Distribution of ASARCO Heavy Metals in Tacoma-Area Lakes" – Angie Calderón; *Dr. Jeffrey Tepper, University of Puget Sound*
- H-3 "Optimizing Photovoltaic Positioning and Ratios of Solar to Vegetated Roof Systems" – Carla Cerda, Nicole E. Statler, Amanda M. Adam; *Dr. Ted C. Eckmann, University of Portland*
- H-4 "Using Passive Sampling to Address Ozone in Sparsely Monitored Areas" – Cole Crosby, Jacinda Mainord (Portland State University), Sara Brunk (Oregon State University); *Dr. Linda George (Portland State University), Concordia University*
- H-5 "How Wildfire Shapes Geomorphic Complexity and Aquatic Communities in Tributaries of the Middle Fork of the Salmon River, Idaho" – Natasha Dacic; *Dr. Jaime Goode, College of Idaho*
- H-6 "Geochemical Analysis of Vineyard Soils in the Columbia River Basin" – Alex Ihle, Adrian Morton, Silas Morgan, Bryn Kimball; *Dr. Bryn Kimball, Whitman College*
- H-7 "Evaluating the Success of Engineered Log Jam Strategies" – Cole Jackson; *Dr. Peter Wimberger, University of Puget Sound*
- H-8 "Determining the Dispersion of Pollutants from an Arsenic Mine" – Mark Melton; *Dr. Jessica Martin and Dr. Chrissie Carpenter, University of Great Falls*
- H-9 "Climate and Dengue Fever in the Southern United States" – Alia Razid, Paige Yeakle; *Dr. Melinda Butterworth, Willamette University*
- H-10 "Improvements to a Single-Column Ocean Model" – Huizhi Xu; *Dr. Sam Pimentel, Trinity Western University*



POSTER I - MICROBIOLOGY

- I-1 "The Effects of Routine Hygiene Habits on the Concentration of Oral Bacteria" – Patrick Anderson; *Dr. Jennifer Swanson, University of Great Falls*
- I-2 "Ability of the Bacterial Predator *Bdellovibrio bacteriovorus* to Catabolize Prey Derived Alanine" – Sam Burch; *Dr. Mark O. Martin, University of Puget Sound*
- I-3 "Clash of the *Caulobacters*: The Evolutionary Trade-off of Exopolysaccharide Production in *Caulobacter crescentus*" – Alexis Carey, Jessenia Chavez; *Dr. Melissa Marks, Willamette University*
- I-4 "Alteration of Host Cell Lipid Metabolism by Murine Herpesvirus 68 (MHV-68)" – Sarah Clark; *Dr. Tracie Delgado, Northwest University*
- I-5 "Investigations into the Reduction of Hospital Acquired Infections" – Sydney Laughton, Patrick Tennican (Hyprotek), Abby Lawson; *Dr. William Ettinger, Gonzaga University*
- I-6 "Identification and Testing of Two Unknown Genes within the TonB2 System of *V. vulnificus*" – Hailey Pfeifer, Justin Rudd, Adel Barnes; *Dr. Ryan Kenton, University of Portland*
- I-7 "Does Poor Feeder Maintenance Increase Exposure of Hummingbirds to Pathogenic Bacteria and Fungi?" – Elizah Stephens; *Dr. Don Powers, George Fox University*
- I-8 "Antibiotic Resistance Gene Profiles Among Soil and Manure Bacterial Communities" – Eleanor Thaler, Jamie Steach; *Dr. Gyorgyi Nyerges, Pacific University*



POSTER J - PHYSICS

- J-1 "The Design and Construction of a Solar Powered Car" – John Adam, Mason Adams; *Dr. Tianbao Xie, Linfield College*
- J-2 "The Acoustics of Harmon Mutes" – Zach Armstrong; *Dr. Rand Worland, University of Puget Sound*
- J-3 "Isochrone Fitting of Hubble Data in UV-Vis Bands" – Hallie Barker; *Dr. Nathaniel Paust, Whitman College*
- J-4 "Geometric Flows of Polygons" – Eli Barnes, Mack Beveridge, Elijah Barnes; *Dr. Paul T. Allen, Lewis & Clark College*
- J-5 "Accelerating towards approximations: on the relationship between interpolation and differential equations" – Will Callahan, Leo Trujillo, Sam Chandler; *Dr. Thomas Cameron, College of Idaho*
- J-6 "Aerial Imaging and Image Analysis of Peach Orchards and Onion Fields" – Esteban Cano, Ryan Horton; *Dr. Duke Bulanon, Northwest Nazarene University*
- J-7 "Shifts in Students' Views about Diversity in Physics" – Sierra Decker, Kara Gray, Laurie Mendes, Jane Paeng, Amy Robertson, Lane Seeley, Jenny Tenlen, Stamatis Vokos; *Dr. Abigail Daane, Seattle Pacific University*
- J-8 "Construction and Testing of Experiment to Measure Fluorescence Lifetimes of Fluorophores for Luminescent Solar Concentrators" – Jordan Fonseca; *Dr. Amy Spivey, University of Puget Sound*
- J-9 "Monte Carlo Acceptance Simulations for the Prototype Active-Target Time-Projection Chamber" – Joseph Gutierrez, Jourden Simmons; *Dr. Adam Fritsch, Gonzaga University*
- J-10 "Variable Stars in M92 and M15" – Riley Jordan; *Dr. Nathaniel Paust, Whitman College*
- J-11 "Detecting Cosmic Rays" – Graham Lelack, Eric Engel; *Dr. Matthew Geske, Gonzaga University*
- J-12 "The Response of High Energy Photoelectrons in The Mars Atmosphere to Variable Solar Input" – Isabel Mills, Frank Eparvier (Colorado University Boulder), Edward Thiemann (Colorado University Boulder); *Dr. Nathaniel Paust, Whitman College*
- J-13 "A Spatial Analysis of Infall Coincident with Galactic Mid-Infrared Bubble Rims" – Johanna Mori; *Dr. Katie Devine, College of Idaho*
- J-14 "Fly Swarms and Complexity" – Kuzivakwashe Rusere; *Dr. Joelle Murray, Linfield College*
- J-15 "Segue 3: The Youngest Globular Cluster in Our Galaxy" – Spencer Schiefelbein; *Dr. Joanne Hughes, Seattle University*
- J-16 "Studies of the Gating of the Myosin VI Dimer by Intramolecular Forces" – Dylan Tooley, Ellen Rumley; *Dr. David Altman, Willamette University*
- J-17 "Measuring the Effects of Liquid Environment on Graphene Biotransistors" – Agatha Ulibarri; *Dr. Ethan Minot (Oregon State University), Dr. Morgan Brown (Oregon State University), and Dr. Michael Crosser, Linfield College*