



MURDOCK COLLEGE SCIENCE RESEARCH PROGRAM

*The ICing on
Undergraduate Research*

THE 24th ANNUAL MCSR CONFERENCE

SPONSORED BY THE M.J. MURDOCK CHARITABLE TRUST



CO-HOSTED WITH UNIVERSITY OF PORTLAND

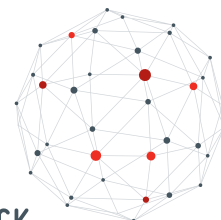




24th Annual MCSR Conference

"The ICing on Undergraduate Research"

Hilton Hotel, Vancouver, WA
Co-host: University of Portland & M. J. Murdock Charitable Trust



MURDOCK
COLLEGE SCIENCE
RESEARCH PROGRAM

Thursday, Nov. 5, 2015

5:00 – 9:00 p.m. Registration will be available - Hotel Lobby

Friday, Nov. 6, 2015

6:45 – 8:00 a.m. **REGISTRATION** - Heritage Pre-Function

BREAKFAST – Heritage Ballroom

7:00 – 8:00 a.m. **WORKING BREAKFAST** - Hemlock/Oak - *For judges and MCSR Panel members*
(Please go directly to the room for breakfast)

8:00 – 8:30 a.m. **OPENING / WELCOME** - Discovery Ballroom

- MC – Dr. Moses Lee, *M.J. Murdock Charitable Trust*
- Fr. Dr. Mark Poorman, *President, University of Portland*
- Mr. Terry Stokesbary, *Senior Program Director for Enrichment, M.J. Murdock Charitable Trust*

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

Discovery - A/B
Presider: Dr. Dan Nogales, *Professor of Chemistry Department, Dean of Arts and Sciences, Northwest Nazarene University;*
Microphone: David Griffith

SYMPOSIUM ON LIFE SCIENCES

Discovery C/D/E
Presider: Dr. Gyorgyi Nyerges, *Associate Professor of Biology and Director of Undergraduate Research, Pacific University;*
Microphone: Anne Kruchten

10:10 – 10:30 a.m. **BREAK** – Discovery Foyer

11:50 a.m. – 1:15 p.m. **LUNCH** – Heritage Pre-Function. Set up posters in Heritage Ballroom.
Enrichment fun game activity for student teams from each school - Please watch for Terry, Conner, and Mary

Noon – 1:00 p.m. **ENRICHMENT PRESENTATIONS** – Hemlock/Oak – For Administrators, Faculty, Staff
Presentations on "ICing on Undergraduate Research" 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**

1:00 – 2:45 p.m. **POSTER SESSION #1 (A, B, G, H, I)** – Heritage Ballroom – *Please have posters up and ready.*

2:45 – 4:30 p.m. **POSTER SESSION #2 (C, D, E, F, J)** – Heritage Ballroom

4:30 p.m. **TAKE DOWN POSTERS** – Heritage Ballroom

5:00 – 5:45 p.m. **"WHY CRYSTALLOGRAPHY IS IMPORTANT IN UNDERGRADUATE RESEARCH" SESSION (OPTIONAL)**. Hosted by Bruker.

Hemlock/Oak
Ms. Eva Blanpied, *Senior Sales Representative, Single Crystal Diffraction, Bruker AXS, Inc.*



- 6:00 – 8:30 p.m. **BANQUET** – Heritage Ballroom
Welcome: Dr. Steve Moore, *Executive Director, M.J. Murdock Charitable Trust*
Welcome: Dr. Thomas Greene, *Provost, University of Portland*
Short Entertainment: Brian Doyle, *Editor of Portland Magazine at University of Portland*
Special Recognition and Invocation: Mr. Terry Stokesbary
NEAL THORPE MEMORIAL LECTURE: "From Scorpions to Sea-Slugs: Creating Effective New Drugs from Blueprints in Nature" Dr. James M. Olson, MD, PhD, *Full Member, Fred Hutchinson Cancer Research Center, Seattle, WA*
- 8:30 p.m. **"GET TO KNOW YOUR COLLEAGUES SESSION"** - Hemlock/Oak
For Administrators, Faculty, and Staff only.

Saturday, Nov. 7, 2015

- 6:45 – 8:00 a.m. **BREAKFAST** - Heritage Ballroom
- 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 | SYMPOSIUM ON LIFE SCIENCES |
|---|---|
| Discovery - A/B | Discovery C/D/E |
| Presider: Dr. Amy Spivey, <i>Associate Professor of Physics, University of Puget Sound;</i> | Presider: Dr. Anne Kruchten, <i>Associate Professor of Biology and Chair, Linfield College;</i> |
| Microphone: Mark Bussell | Microphone: Brett Kaiser |
- 9:20 – 9:40 a.m. **BREAK** – Discovery Foyer
- 11:20 a.m. – 12:20 p.m. **LUNCH AND CHECK OUT** - Heritage Ballroom
- 12:20 – 1:20 p.m. **CLOSING/AWARDS** – Heritage Ballroom
- MC - Dr. Moses Lee, *Program Director, M.J. Murdock Charitable Trust*
 - Dr. Michael Andrews, *Dean of Arts and Sciences, University of Portland*
 - Dr. John Van Zytveld, *Senior Fellow, M.J. Murdock Charitable Trust*
 - Dr. Peter Collings, *Professor of Physics, Swarthmore College*
 - Dr. Gina MacDonald, *Professor of Chemistry, James Madison University*
 - Dr. Tom Bultman, *Professor of Biology, Hope College*

Faculty Enrichment Workshop - Those who have received information about the workshop, please head to the Hemlock/Oak room immediately after the closing ceremony.

Please be sure to complete this **short conference survey**: <https://www.surveymonkey.com/r/JD5FRHM>
You will also receive an email with this link. Your input is greatly valued and very much appreciated.



PHYSICAL SCIENCES

ORAL PRESENTATIONS

Friday, November 6th, Discovery A/B

8:50 AM – 11:50 AM; Presider Dr. Dan Nogales, Northwest Nazarene University

1. "Investigating Interaction between CdSe Nanocrystals and Dithiocarbamate Ligands" – Matthew C. Garling; *Dr. Andrea M. Munro, faculty advisor, Pacific Lutheran University – 8:50 – 9:10*
2. "Layer-by-Layer Thin Film Assembly and Catalysis using Polymer-Capped Nanoparticles" – Natasha Siepser; *Dr. David Rider, faculty advisor, Western Washington University – 9:10 – 9:30*
3. "Capacitance Measurements of Defects in Solar Cells: Checking the Model Assumptions" – Alexander Ogle; *Dr. Jennifer Heath, faculty advisor, Linfield College – 9:30 – 9:50*
4. "Nanostructured Polymer Lithography for Photovoltaic Applications" – Allison Christy; *Dr. Jerry Harris, faculty advisor, Northwest Nazarene University – 9:50 – 10:10*

Break 10:10 - 10:30

5. "Facile synthesis of thermo-responsive biodegradable polymers for drug delivery applications" — Aidan Morrell; *Dr. Jing Hao, faculty advisor, George Fox University – 10:30 – 10:50*
6. "Exploring the effects of purine nucleotides on the structure and function of Burkholderia cenocepacia HMG-CoA Reductase" – Matthew Clark and Eric Feichtinger; *Dr. Jeff Watson, faculty advisor, Gonzaga University – 10:50 – 11:10*
7. "Quantum State Tomography" — Anthonée Georgette; *Dr. Andy Dawes, faculty advisor, Pacific University – 11:10 – 11:30*
8. "Molecular Line Observations of Galactic Mid-Infrared Bubble Rims" — Johanna Mori and Dr. Christer Watson (Manchester University); *Dr. Kathryn Devine, faculty advisor, College of Idaho – 11:30 – 11:50*



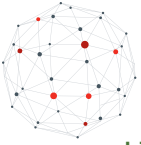
Saturday, November 7th, Discovery A/B

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

9. "Young star clusters as a tracer of star formation in early-type galaxies" – Sidney Vetens; *Dr. Alison Crocker, faculty advisor, Reed College – 8:00 – 8:20*
10. "Understanding Combination Modes in Multimode Variable Stars" – Kristian Barajas; *Dr. Richard Watkins, faculty advisors, Willamette University – 8:20 – 8:40*
11. "Finding the Age of a Star Cluster: SEGUE 3" – Olivia Corrin, Spencer Schiefelbein, Hanah Joudi, and Donna Le; *Dr. Joanne Hughes, faculty advisor, Seattle University – 8:40 – 9:00*
12. "Runaway Stars as a Possible Source of the Elliptical Ring Structure in NGC 7538" — Jason Arakawa; *Dr. Cassandra Fallscheer and Dr. Darci Snowden, faculty advisors, Central Washington University – 9:00 – 9:20*
13. "Characterization of a novel RNA tertiary interaction found in the THF riboswitch" — Laura DeWald and Dustin Kress; *Dr. Wade Grabow, faculty advisor, Seattle Pacific University – 9:40 – 10:00*

Break 9:20 - 9:40

14. "Mo-Cu Carbon Monoxide Dehydrogenase: Computational and Synthetic Models" – Jacob O'Connor, Chris Williams, Morgan Dienst, Tao Large, Marius Retegen, and Frank Neese; *Dr. Dalia Rokhsana, faculty advisor, Whitman College – 10:00 – 10:20*
15. "Anti-hyaluronidase activity of methanolic plant extracts, and implications in neurodegenerative repair" – Jake Van Campen; *Dr. Angela Hoffman, faculty advisor, University of Portland – 10:20 – 10:40*
16. "Quantifying the effects of canopy cover on seedling dynamics in a hyperdiverse Amazonian rainforest" — Robin Gropp; *Dr. Margaret Metz, faculty advisor, Lewis & Clark College – 10:40 – 11:00*
17. "The importance of seed characteristics in the dispersal of splash cup plants" – Joel Eklof; *Dr. Rachel Pepper, faculty advisor, University of Puget Sound – 11:00 – 11:20*



LIFE SCIENCES

ORAL PRESENTATIONS

Friday, November, 6th, Discovery A/B

8:50 AM – 11:50 AM; Presider Dr. Gyorgyi Nyerges, Pacific University

1. "Testing the genetic requirement of stressosome genes in the H₂O₂ stress response of *Bacillus subtilis*" — Kara Geraci and Giovanni Midili; *Dr. Carla Bonilla, faculty advisor, Gonzaga University – 8:50 – 9:10*
2. "Elucidating a link between oxidative stress, transcription, and adaptive mutagenesis in the yeast *Saccharomyces cerevisiae*" – Jessika S. Iverson; *Dr. Tina T. Saxowsky, faculty advisor, Pacific Lutheran University – 9:10 – 9:30*
3. "Searching for Nuclear inclusion X, a Potential Pathogen of Pacific Razor Clams" — Tyler Griffin, Marissa Specht, Mitch Vandenberg, and Dr. Steven Fradkin; *Dr. Jeremy Weisz, faculty advisor, Linfield College – 9:30 – 9:50*
4. "Insights into the molecular ecology of Desmidiaceae algae using single-cell genetics."- Selyna Villareal, Magaret Gorini, and Bayley Larsen; *Dr. Michael Zanis, faculty advisor, Seattle University – 9:50 – 10:10*

Break 10:10 - 10:30

5. "Evaluation of Gene Flow in Populations of *Culex tarsalis* in Montana Using COI Sequences" – Jacob Fiocchi; *Dr. Jennifer Glowienka, faculty advisor, Carroll College – 10:30 – 10:50*
6. "Dissecting frizzled-independent planar cell polarity in the *Drosophila* wing epithelium" – Donovan Sneddon; *Dr. Dennis Venema, faculty advisor, Trinity Western University – 10:50 – 11:10*
7. "Use of Camera Trap Monitoring to Detect Abundance and Distribution of Jaguar and other Forest Carnivores/Prey Species in Costa Rican Neotropical Rain Forests" – Christian Rohnert, Kayla Hiatt, Elliott Haragos, Johanna Hay-Smith, Brytanie Self, and Zach Thompson; *Dr. Leslie Hay, faculty advisor, Northwest Nazarene University – 11:10 – 11:30*
8. "Eight arms, acid and hot water: Changes in octopus energy budgeting in response to ocean acidification and rising sea temperatures" – Monica Culler, Kaitlyn Jacobs, and Levi A. Evans; *Dr. Kirt Onthank, faculty advisor, Walla Walla University – 11:30 – 11:50*



Saturday, November 7th, Discovery A/B

8:00 AM – 11:20 AM; Presider Dr. Anne Kruchten, Linfield College

9. "Altered zinc ion levels and transporter expression indicate that high liver copper disrupts zinc metabolism in the *Atp7b* ^{-/-} mouse model of Wilson Disease"- Kelsey Meacham; *Dr. Jason Burkhead, faculty advisor, University of Alaska Anchorage – 8:00 – 8:20*
10. "Developing an in vitro model to test how blood flow influences endothelial cell phenotype in health and disease" — Alexander Honeyman (Whitman College), Jan-Renier Moonen (Stanford University), and Marlene Rabinovitch (Stanford University); *Dr. Ginger Withers, faculty advisor, Whitman College – 8:20 – 8:40*
11. "Dual Roles of Fer Kinase are Required for Proper Hematopoiesis and Vascular Endothelium Organization During Zebrafish Development" – Alex Hoffmann, Hillary Le, Elizabeth Billquist, Amy VanderStoep, and Elisabeth Spencer; *Dr. Aaron Putzke, faculty advisor, Whitworth University – 8:40 – 9:00*
12. "The Effect of Mitochondrial DNA Deletions on the Lifespan, Fecundity, and Stress Tolerance of *Caenorhabditis elegans* nematodes"- Carly Percell, and Cameron Chow; *Dr. Katie Clark, faculty advisor, Pacific University – 9:00 – 9:20*

Break 9:20 - 9:40

13. "Sugar Coat It: *Caulobacter crescentus* Defense Mechanism Against Bacteriophage CR30" — Taylor Heckman and Kathryn Herr; *Dr. Melissa Marks, faculty advisor, Willamette University – 9:40 – 10:00*
14. "What are the Effects of Invasive Plant Removal in an Urban Forest?" — Michelle Garfias; *Dr. Paulette Bierzychudek, faculty advisor, Lewis & Clark College – 10:00 – 10:20*
15. "Assessing the feeding, growth, and energetics of hydrothermal vent gastropod larvae (*Shinkailepas* n. sp.)" — Jacob Krodel (Seattle Pacific University); *Dr. Shawn M. Arellano, faculty advisor, Shannon Point Marine Center – 10:20 – 10:40*
16. "Mytilus Mussels as Bio-indicators of Microplastic Pollution" — Nicholas Lyon; *Dr. Peter Hodum, faculty advisor, University of Puget Sound – 10:40 – 11:00*
17. "May the Force be with you: the physics of autotomy" – Stephanie Rager and Jake Williams; *Dr. Tara Maginnis, faculty advisor, University of Portland – 11:00 – 11:20*



POSTER SESSIONS

POSTER A - ECOLOGY / PLANTS / BIRDS

- A-1 "Anthropogenic contaminants in southern sea otters (*Enhydra lutris nereis*) inhabiting Elkhorn Slough, a Californian coastal estuary" –Rosario Fuentes (Alaska Pacific University), Tim Tinker, Ben Weitzman and Sarah Espinosa (USGS Santa Cruz CA), Erin Dodd (CA Dept of Fish & Wildlife), Karl Mayer, Michelle Staedler, Marissa Young and Mike Murray (Monterey Bay Aquarium); *Dr. Leslie Cornick, faculty advisor, Alaska Pacific University*
- A-2 "A macroinvertebrate assessment of stream health at Deep Creek and Ninilchik River, Kenai Peninsula, Alaska" –Hannah Gould, Amanda King, Jason Geck, and Bradley Harris; *Dr. Amanda King, faculty advisor, Alaska Pacific University*
- A-3 "Ecological Impact of the Introduced Colorado Checkered Whiptail (*Aspidoscelis neotesselata*) in Grant County, Washington" – Troy Peterson; *Dr. Robert Weaver and Dr. Daniel Beck, faculty advisors, Central Washington University*
- A-4 "Environmental impact on heat loss from hummingbird nests" – Noemi Camacho; *Dr. Donald Powers, faculty advisor, George Fox University*
- A-5 "How much can hummingbirds increase nectar consumption during extreme energetic demand" – Rosalee Elting; *Dr. Donald Powers, faculty advisor, George Fox University*
- A-6 "The presence of androgen sensitive glands in male and female *A. flavipunctatus*" – Geovar Agbayani; *Dr. Nancy Staub, faculty advisor, Gonzaga University*
- A-7 "To eat or not to eat: a question of diet, detoxification, and survival of the Lumholtz's tree kangaroo (*Dendrolagus lumholtzi*)" – Tessa Anton; *Dr. Sigrid Heise-Pavlov, faculty advisor, Gonzaga University*
- A-8 "Flight initiation distance of yellow-bellied marmots (*Marmota flaviventris*) along an urban-rural continuum" – Taylor Bobovsky and Charlie A. Kittridge; *Dr. Elizabeth A. Addis, faculty advisor, Gonzaga University*
- A-9 "Mechanical and chemical influences on recolonization by stem mining weevils after control of a noxious weed" –Brennan Calley, Rebecca Velasco, and Austin Gabriel; *Dr. Gary Chang, faculty advisor, Gonzaga University*
- A-10 "Determining the toe morphology of the lungless salamander, *Aneides lugubris*" – Petros Raygoza; *Dr. Nancy Staub, faculty advisor, Gonzaga University*
- A-11 "The presence of dorsal and ventral courtship glands in both male and female *Desmognathus brimleyorum* (Amphibia: Plethodontidae)" – Robert Rollins; *Dr. Nancy Staub, faculty advisor, Gonzaga University*
- A-12 "Mechanical and chemical influences on recolonization by stem mining weevils after control of a noxious weed" –Rebecca Velasco, Brennan Calley, and Austin Gabriel; *Dr. Gary Chang, faculty advisor, Gonzaga University*
- A-13 "What are the Effects of Invasive Plant Removal in an Urban Forest?" – Katrina Von Burg, Michelle Garfias, and Fran Novak; *Dr. Paulette Bierzychudek, faculty advisor, Lewis & Clark College*



- A-14 "Do Seedling Trait Strategies Have Tradeoffs for Species Performance?" – Mason Wordell; *Dr. Margaret Metz, faculty advisor, Lewis & Clark College*
- A-15 "Fungal and Microbial Succession Across a Coarse Woody Debris Chronosequence" – Lewis Faller; *Dr. John Syring, faculty advisor, Linfield College*
- A-16 "How Changes in plant community structure affect terrestrial invertebrate food webs" – Renee LaFountain and Sarah Rasmussen-Rehkopf; *Dr. Chadwick V. Tillberg, faculty advisor, Linfield College*
- A-17 "Geographic and interspecific differences in sponge microbiomes in the Oregon coast" – Kathryn Van Dyk; *Dr. Jeremy Weisz, faculty advisor, Linfield College*
- A-18 "Abundance and Distribution of Terrestrial Wildlife in Costa Rican Rain Forests." – Elliott Haragos, Christian Rohnert, Kayla Hiatt, Brytanie Self, Zach Thompson, and Johanna Hay-Smith; *Dr. Leslie Hay, faculty advisor, Northwest Nazarene University*
- A-19 "Bioacoustic analyses of undescribed vocalizations from two anuran species found in Costa Rica." – Jaime Sandoval and Carli Shaul; *Dr. John Cossel Jr., faculty advisor, Northwest Nazarene University*
- A-20 "Early Life History of Olympia oysters (*Ostrea lurida*) within Fidalgo Bay, Washington" – Jefferson Emm; *Dr. Marco Hatch, faculty advisor, Northwest Indian College*
- A-21 "Song Divergence as a Mechanism for Ecological Speciation in Red Crossbills (*Loxia curvirostra*)" – Ingrid E. Clark and Emily J. Gunnarson; *Dr. Julie W. Smith, faculty advisor, Pacific Lutheran University*
- A-22 "Cryptic speciation in the brown madtom, *Noturus phaeus*" – Ashley A. Farre and Christian D. McConnell; *Dr. Jacob J. D. and Dr. Heidi Schutz, faculty advisors, Pacific Lutheran University*
- A-23 "Characterizing the Jasmonate Response of the "coi1-17 *Arabidopsis thaliana*" Mutant" – Renee M. Lumia and Robert M. Filley; *Dr. Neva L. Laurie-Berry, faculty advisor, Pacific Lutheran University*
- A-24 "Seed Predation Rates in Urban and Rural Populations of Scotch Broom (*Cytisus scoparius* L.)" – Nathan Krueger; *Dr. Robert Bode, faculty advisor, Saint Martin's University*
- A-25 "Pollinator Selection on Flower Size in Scotch Broom (*Cytisus scoparius* L.)" – Rebecca Tong; *Dr. Robert Bode, faculty advisor, Saint Martin's University*
- A-26 "A Dopamine-PABA Adduct Assay Enables Spectrophotometric Quantification of Dopamine Release by the Marine Alga, *Ulvaria obscura*" – Thao Nguyen, Tayler A. Wyss, and Dr. Timothy A. Nelson; *Dr. Richard L. Ridgway, faculty advisor, Seattle Pacific University*
- A-27 "Abundances and distributions of invertebrate colonists in sandy beach algal wrack" – Amber Olander; *Dr. Ryan Ferrer, faculty advisor, Seattle Pacific University*



- A-28 "Old growth forest vs. transmission powerline right-of-ways: variation in avian populations based on habitat differences" – Eliot Orando and John McAuley; *Dr. Eric Long, faculty advisor, Seattle Pacific University*
- A-29 "Dopamine Production and Storage Correlate with Acidic Compartments in Living Cells of the Marine Alga, *Ulvaria obscura*" – Jessica Soderquist; *Dr. Richard L. Ridgway, faculty advisor, Seattle Pacific University*
- A-30 "Habitat use and gene flow of Virginia opossum (*Didelphis virginiana*) and raccoon (*Procyon lotor*) in an urban environment" – Nicolas Iapoce; *Dr. Mark Jordan, faculty advisor, Seattle University*
- A-31 "Phylogenetic Analysis Improves Resolution of Evolutionary Relationships in *Lomatium*" – McKayla Stevens; *Dr. Marco Hatch, faculty advisor, College of Idaho*
- A-32 "Characterizing the effects of herbivory and competition on native *Camassia quamash* in Garry oak ecosystems" – Jennifer Rumley; *Dr. David Clements, faculty advisor, Trinity Western University*
- A-33 "The Effects of Nutrient Loading in Coastal Wetlands in Newport, OR" – Cody Fischer and Kristen Jakstis; *Dr. Christine Weilhoefer, faculty advisor, University of Portland*
- A-34 "Examining egg surface morphology and microbial content of *Sceloporus virgatus* eggshells" – Linnaea Arnett and Dr. Mark Martin; *Dr. Stacey Weiss, faculty advisor, University of Puget Sound*
- A-35 "Intra and inter-specific variations in owl feather structure" – Galen Dolkas; *Dr. Peter Wimberger, faculty advisor, University of Puget Sound*
- A-36 "Evaluating the impact of high and low flow tidal environments on microplastic ingestion in a marine filter feeder" – Olivia Mitchell; *Dr. Peter Hodum, faculty advisor, University of Puget Sound*
- A-37 "Influence of environmental factors on vertical distribution of phytoplankton in Lacamas Lake, WA" – Kaitlin Perkins, Gretchen Rollwagen-Bollens, and Stephen Bollens; *Dr. Gretchen Rollwagen-Bollens, faculty advisor, Washington State University Vancouver*
- A-38 "Maintenance of Mutualism in a Neotropical Fig: *Ficus Pertusa* and Its Wasp Symbionts" – Asa Mease; *Dr. Susanne Altermann, faculty advisor, Whitman College*
- A-39 "Diversity within and between Chilean *Mimulus* species" – Jessica Palacios; *Dr. Arielle Cooley, faculty advisor, Whitman College*
- A-40 "Root Diversity in the Genus *Rhododendron*" – Louisa Rogers, Jean Burns (Case Western Reserve University), Jaynell Nicholson (Kent State University), Oscar Valverde (Petrópolis), and Juliana Medeiros (Holden Arboretum); *Dr. Heidi Dobson, faculty advisor, Seattle Pacific University*
- A-41 "Do invasive plants influence habitat selection for brooding sage-grouse?" – Asa Arhelger and Molly Steck; *Dr. Grant Casady, faculty advisor, Whitworth University*
- A-42 "Do brooding sage-grouse prefer areas with more mesic habitat?" – Rachael Bachler; *Dr. Grant Casady, faculty advisor, Whitworth University*
- A-43 "Interacting Effects of Fire and Animal Disturbance on a Prairie Restoration" – Kimberly Cook (Washington State University Vancouver); *Dr. Margaret O'Connell and Dr. Rebecca Brown, faculty advisors, Eastern Washington University*



POSTER B - DEVELOPMENTAL BIOLOGY / PHYSIOLOGY

- B-1 "Comparative Effects of Low to High Carbohydrate Consumption on MCF-7 Breast Cancer Cells Growth Rate, Proliferation, NADH Production and Cell Cycle" – Cassie Weldon; *Dr. Ian Quitadamo, faculty advisor, Central Washington University*
- B-2 "Development of a Mouse Model of Obesity via High Sucrose Consumption" – Shaina Miller; *Dr. Sarah Comstock, faculty advisor, Corban University*
- B-3 "PBX4 is Responsible for Temporal Onset and Limitation of Cardiomyocyte Differentiation in Zebrafish?" – Joel Rurik; *Dr. Lisa Maves, faculty advisor, George Fox University*
- B-4 "B-Raf is required for normal cardiomyocyte growth" – Katherina Rees; *Dr. Natasha Cattergoon, faculty advisor, Linfield College*
- B-5 "Effects of selection for high voluntary wheel running on sexual dimorphism in the sacrum of *Mus musculus*" – Crystal L. Asplund; *Dr. Heidi Schutz, faculty advisor, Pacific Lutheran University*
- B-6 "A Correlation of Performance and Morphological Changes in Mice with High Voluntary Wheel Running" – Kyler W. Perry; *Dr. Heidi Schutz, faculty advisor, Pacific Lutheran University*
- B-7 "Effect of Wolbachia on the Reproductive Output of Field Collected *Drosophila melanogaster*" – Helen Donelick and Jamie Steach; *Dr. Joanne Odden, faculty advisor, Pacific University*
- B-8 "Push it, Push it Real Good: The Energetic Cost of Stroller Running" – Ryan Alcantara; *Dr. Cara Wall-Scheffler, faculty advisor, Seattle Pacific University*
- B-9 "Cellular Assays and Image Analysis for iCHIP Platforms" – Kaylan Banks and Elizabeth Wheeler; *Dr. Dave Soscia and Dr. Monica Moya, faculty advisor, Seattle Pacific University*
- B-10 "Tardigrades contain at least six putative proteins involved in gene silencing" – Julian Conn Busch; *Dr. Jenny Tenlen, faculty advisor, Seattle Pacific University*
- B-11 "Identifying and characterizing the germline protein Vasa in the tardigrade *Hypsibius dujardini*" – Sierra Sanders; *Dr. Jenny Tenlen, faculty advisor, Seattle Pacific University*
- B-12 "Examining the cardio protective effects of exercise in young and old mice" – Nathan McLaughlin and Sherilynn Soo; *Dr. Stephen Luckey, faculty advisor, Seattle University*
- B-13 "Measuring body composition in Weddell seals to describe links between reproduction, health, and environment" – Chelsea Destefano and Amy L. Kirkham; *Dr. Jennifer Burns, faculty advisor, University of Alaska Anchorage*
- B-14 "The Effects of Anthropogenic Detritus on *Hemigrapsus nudus*" – Luke Kemp; *Dr. Tara Maginnis, faculty advisor, University of Portland*
- B-15 "The impact of temperament on maternal-infant interactions" – Christine Nguyen, Sam Nicols, Ashley Barling, Cery Sullivan, Elizabeth Nousen, and Joel Nigg; *Dr. Elinor Sullivan, faculty advisor, University of Portland*



- B-16 "The Effect of Diet on Nonhuman Primate Behavior Across Development" – Giulia Oliva, Jeanette Valleau, and Kelly Riper; *Dr. Elinor Sullivan, faculty advisor, University of Portland*
- B-17 "Regulation of the Wnt/B-catenin pathway by steroid hormones in *Danio rerio* ovarian tissue" – Macaulie Casey; *Dr. Alyce DeMarais, faculty advisor, University of Puget Sound*
- B-18 "Effect of high water temperature on apoptosis in zebrafish (*Danio rerio*) ovarian tissue" – Sarah Mueller; *Dr. Alyce DeMarais, University of Puget Sound*
- B-19 "Bioaccumulative and toxic hepatic effects of ingested clean and PBT-saturated microplastics on *Oryzias latipes* (Japanese Medaka fish)" – Kieran O'Neil and Megan Gessel; *Dr. Peter Hodum, faculty advisor, University of Puget Sound*
- B-20 "The Role of LmcA at the Growth-to-Development Transition" – Michael Behrens; *Dr. David Lindsey, faculty advisor, Walla Walla University*
- B-21 "The effects of elevated pCO₂ and temperature on hypoxia tolerance in *Octopus rubescens*" – Levi A. Evans, Kaitlyn Jacobs, and Monica Culler; *Dr. Kirt Onthank, faculty advisor, Walla Walla University*
- B-22 "Adipose tissue transcription factor expression in nutritionally-programmed offspring" – Natasha McDougal, Anh Ngo, Brianna Cowin, and Susan Bagby (OHSU); *Dr. Elizabeth DuPriest, faculty advisor, Warner Pacific College*
- B-23 "Mechanisms of hepatic hypersensitivity to growth hormone in nutritionally-programmed offspring" – Anh Ngo (Warner Pacific College), Alexandra Quackenbush (University of Portland), and Susan Bagby (OHSU); *Dr. Elizabeth DuPriest, faculty advisor, Warner Pacific College*
- B-24 "Life Under Pressure: Potential Pressure Counteractants in Amphipods in the Kermadec and Mariana Trenches" – Anna Downing, Chloe Weinstock, and Gemma Wallace; *Dr. Paul Yancey, faculty advisor, Whitman College*
- B-25 "Life In the Trenches: Discovering New Fish Species and Their Adaptation in the Mariana Trench" – Chloe Weinstock, Anna Downing, and Mackenzie Gerring (University of Hawaii); *Dr. Paul Yancey, faculty advisor, Whitman College*
- B-26 "Asymmetric Wnt Pathway Signaling Facilitates Stem Cell-Like Divisions via the Non-Receptor Tyrosine Kinase FRK-1 in *Caenorhabditis elegans*" – Adriana Calderon, Danielle Mila, Austin Baldwin, Kelsey Moore, McLane Watson, and Bryan Phillips; *Dr. Aaron Putzke, faculty advisor, Whitworth University*



POSTER C - MOLECULAR AND CELL BIOLOGY

- C-1 "Studies of antibiotic resistance in an arsenic contaminated watershed" – Sarah Ladd; *Dr. Jennifer Lowell, faculty advisor, Carroll College*
- C-2 "V-ATPase Feedback Regulation of Glycolytic Enzymes in Breast Tumor Cell Lines via HIF-1?" – Tyler Northrup; *Dr. Colleen Fordyce (University of New Mexico) and Dr. Sam Alvey, faculty advisors, Carroll College*
- C-3 "Studies of antibiotic resistance in an arsenic contaminated watershed" – Kurt Parker; *Dr. Jennifer Lowell, faculty advisor, Carroll College*
- C-4 "Chromosomal speciation in black flies (Diptera Simuliidae). Does Drainage make a difference?" – Chance Stewart; *Dr. Gerald Shields, faculty advisor, Carroll College*
- C-5 "Effect of Sugar Sweetened Beverages on Glucose Metabolism in the Mouse" – Ken Johnson; *Dr. Sarah Comstock, faculty advisor, Corban University*
- C-6 "CaM Kinase Co-localization and Regulation of p53 in Breast Cancer Cells" – Cody Coblenz and Renee C. Geck; *Dr. John M. Schmitt, faculty advisor, George Fox University*
- C-7 "Novel Development and Optimization of SYBR Green Fluorescence Method to Quantify Malarial Parasites" – Jonah Netland and Ashley Peterson; *Dr. Heather Ayala, faculty advisor, George Fox University*
- C-8 "AKAP7 and Calcineurin Control CaM Kinases and Cell Growth" – Lael Papenfuse; *Dr. Hannah M. McFarland, Dr. Kimberly Dodge-Kafka, and Dr. John M. Schmitt, faculty advisors, George Fox University*
- C-9 "Estrogen Receptor Alpha Utilizes TRP Channel 6 in Cancer Cell Growth" – Emily Rawlings and Angela J. Rofelty; *Dr. John M. Schmitt, faculty advisor, George Fox University*
- C-10 "How does Huntington's disease affect circadian rhythm in *Drosophila melanogaster*?" – Joey Constien, Sydney Hutton, David Dommermuth, and Christina Heid; *Dr. Helen Smith-Flores, faculty advisor, Gonzaga University*
- C-11 "Investigating the basis for an unstable aneuploid phenotype in yeast" – Annie MacKenzie; *Dr. Kirk Anders, faculty advisors, Gonzaga University*
- C-12 "Confirming splice variants from RNA sequence data" – Cristian Castro (Heritage University); *Dr. Andreas Madlung, faculty advisor, University of Puget Sound*
- C-13 "Using inverse PCR to identify unknown gene sequences involved in nicotine tolerance in *Drosophila melanogaster*" – Melanie Morris (Lewis & Clark College) and David Valenzuela (Madison High School); *Dr. Norma Velazquez Ulloa, faculty advisor, Lewis & Clark College*
- C-14 "The gene silencing activity of Regena/NOT2 is dependent upon the activity of microRNAs" – Sean Bowden; *Dr. Catherine Reinke, faculty advisor, Linfield College*
- C-15 "Exploring the Requirement for the CCR4-NOT Deadenylase Complex Subunit Regena/NOT in MicroRNA-mediated Gene Silencing" – Austin Browning and James Knox; *Dr. Catherine Reinke, faculty advisor, Linfield College*



- C-16 "Identification of a new requirement for microRNA-mediated gene silencing" – Michael Morin; *Dr. Catherine Reinke, faculty advisor, Linfield College*
- C-17 "Establishing IRAK-1 as a Therapeutic Target in Acute Myeloid Leukemia" – Rhese Thompson; *Dr. Anupriya Agarwal, faculty advisor, Linfield College*
- C-18 "Comparative Genomic Analysis of E. coli 0177:H25 Pathogenicity Islands" – Matthew Jacobsson and Trevor Smith; *Dr. Jennifer Chase, faculty advisor, Northwest Nazarene University*
- C-19 "The Effect of Mitochondrial DNA Deletions on the Lifespan, Fecundity, and Stress Tolerance of Caenorhabditis elegans nematodes" – Cameron Chow and Carly Percell; *Dr. Katie Clark, faculty advisor, Pacific University*
- C-20 "Investigating how gene deletions shown to influence Q/N and PolyQ aggregation affect τ -synuclein in yeast" – Jordan Rede; *Dr. Anita Manogaran, faculty advisor, Saint Martin's University*
- C-21 "Confirming the Identities of JAtY Clones through End-Sequencing" – Marcus Sheppard; *Dr. Margaret Olney, faculty advisor, Saint Martin's University*
- C-22 "Genome Assembly and Investigation of Agrobacterium F5R19" – Loa Griesbach; *Dr. Derek Wood, faculty advisor, Seattle Pacific University*
- C-23 "Hybrid genome assembly and analysis of Agrobacterium rhizogenes A4" – Genevieve Roberts, Loa Griesbach, and Kathryn Houmiel; *Dr. Derek Wood, faculty advisor, Seattle Pacific University*
- C-24 "Insights into the evolution of a blue light receptor in Desmidiaceae algal species Micrasterias rotata and Micrasterias fimbriata" – Margaret Gorini, Bayley Larsen, and Selyna Villareal; *Dr. Michael Zanis, faculty advisor, Seattle University*
- C-25 "The Evolution of Genome Size in Marine Crustaceans" – Meghan Kennedy and Dylan Gnatz; *Dr. Kristin Hultgren, faculty advisor, Seattle University*
- C-26 "The molecular evolution of beta-amylase in ecologically important green algae Micrasterias rotate and Micrasterias fimbriata" – Bayley Larsen, Margaret Gorini, and Selyna Villareal; *Dr. Michael Zanis, faculty advisor, Seattle University*
- C-27 "Constructing an Infectious Molecular Clone of Simian Foamy Virus Isolated from a Squirrel Monkey" – Israel Lopez and Cooper Hayes; *Dr. Carolyn Stenbak, faculty advisor, Seattle University*
- C-28 "Determining the mechanism of DNA binding of the WhiA bacterial transcriptional regulator; AND Investigating the DNA binding constraints of the I-SobI homing endonuclease" – Raymond Ruff; *Dr. Brett Kaiser, faculty advisor, Seattle University*
- C-29 "The Effect of Electronic Liquids on Human Osteoblast-Like MG-63 Cells" – Mary Margaret Brown; *Dr. Sara Heggland, faculty advisor, College of Idaho*
- C-30 "Analysis of the role of the actin cytoskeleton regulator unc-53/Nav2 in endosomal trafficking" – Nathan Hitchman and Peter Hogg; *Dr. Eve Stringham, faculty advisor, Trinity Western University*



- C-31 "Loukoumasomes are Distinct Subcellular Structures from Rods and Rings and are Structurally Associated with MAP2 and the Nuclear Envelope in Retinal Cells" – Jake Noble, Calvin D. Roskelley, and Diana V. Hunter; *Dr. Julia Mills, faculty advisor, Trinity Western University*
- C-32 "The Roll of COMMD1 in Membrane Protein Trafficking" – Davis Stewart and Kristopher Short; *Dr. Jason Burkhead, faculty advisor, University of Alaska Anchorage*
- C-33 "Cytomegalovirus Epidemiology Study in University of Portland Freshman" – Saifullah Hasan, Ann Hill, and Dr. Jacquie Van Hoomissen; *Dr. Susan Murray, faculty advisor, University of Portland*
- C-34 "Does HCMV Fibroblast Adapted Vaccine Elicit An Atypical Immune Response?" – Lavinia Sagario, Pavlo Nesterenko, and Ann Hill; *Dr. Susan Murray, faculty advisor, University of Portland*
- C-35 "Development of a functional assay for feline T-cells: application to contraceptive vaccine development" – Rochelle Shih, Ann Hill, and Michael Munks; *Dr. Susan Murray, faculty advisor, University of Portland*
- C-36 "The role of MMP-2, 9, and 13, in the regulation of skeletal muscle hypertrophy following functional overload" – Reilly Fitzpatrick; *Dr. Jung Kim, faculty advisor, University of Puget Sound*
- C-37 "Investigation of the response to the ?large-cell? phenotype caused by Rheb, myc, and INR overexpression in *Drosophila melanogaster*" – Bryston Nham; *Dr. Leslie Saucedo, faculty advisor, University of Puget Sound*
- C-38 "The role of MMP9 in satellite cell activation after increased activity" – Michael Pang; *Dr. Jung Kim, faculty advisor, University of Puget Sound*
- C-39 "Effect of altered cellular redox environment on oncogenic activity of the *Drosophila* PRL protein" – Frances Welsh; *Dr. Leslie Saucedo, faculty advisor, University of Puget Sound*
- C-40 "Altered Beta-Adrenergic Signaling in Adipose Tissue of Nutritionally Programmed Microswine Offspring" – Taylor Zehren, University of Portland; *Dr. Elizabeth DuPriest, Warner Pacific College*
- C-41 "Genetic analysis of phytochrome B2 interaction with the environment in tomato plants" – Nereida Pena, Heritage University; *Dr. Andreas Madlung, University of Puget Sound*



POSTER D - NEUROSCIENCE / PSYCHOLOGY / EXERCISE SCIENCE

- D-1 "Exploring the Role of Dctn2 in the Trafficking of GluR2 AMPA Receptors" – Mark Barnett; *Dr. Stefanie Otto-Hitt, faculty advisor, Carroll College*
- D-2 "The effects of chronic exposure to the selective serotonin reuptake inhibitor, escitopram, on behavior in *C. elegans*" – Tykayah Baird; *Dr. Lucinda Carnell, faculty advisor, Central Washington University*
- D-3 "Obesity in Mexican American Men" – Kayla Thomas; *Dr. David Gee, faculty advisor, Central Washington University*
- D-4 "The Contribution of Rab7a to Embryonic Brain Patterning" – Brecken Esper; *Dr. Jim Smart, faculty advisor, George Fox University*
- D-5 "Microglia lack cytokine-induced immune response in mixed glia culture" – Courtney Howard; *Dr. Stephanie Krasnow and Dr. Daniel Marks, faculty advisors, George Fox University*
- D-6 "Antipsychotic clozapine effect on sleep: Attenuated polysomnographic responses to the atypical antipsychotic clozapine in early growth response 3 -deficient mice" – Rahmi Nemri (Gonzaga University), Dr. Janne Gronli (University of Bergen), Michelle Schmidt (Washington State University), and Dr. Amelia Gallitano (University of Arizona); *Dr. Jonathan Wisor, faculty advisor, Gonzaga University*
- D-7 "Motivating Fitness by Travelling the Oregon Trail: Developing and testing an App for That!" – Raiven Greenberg, Jesus Hernandez, Karma Rose Macias, Marco Chairez, Noah Tewelde, and Jeremy McWilliams; *Dr. Erik Nilsen, faculty advisor, Lewis & Clark College*
- D-8 "Examining effects of developmental nicotine exposure on *Drosophila* acetylcholine expression" – Jennifer Lakeman; *Dr. Norma Velazquez Ulloa, faculty advisor, Lewis & Clark College*
- D-9 "Understanding the Role of Thrombospondin (TSP) in the *Drosophila melanogaster* Brain: Examining if TSP is Necessary for the Effects of Nicotine During Development" – Eve Lowenstein; *Dr. Norma Velazquez Ulloa, faculty advisor, Lewis & Clark College*
- D-10 "Tissue-specific expression of GABA receptor isoforms in zebrafish" – Megan Schwehr; *Dr. Cecilia Toro, faculty advisor, Linfield College*
- D-11 "The Effects of Visitors on Chimpanzees (*Pan troglodytes*) at the Oregon Zoo" – Sara Oliver and Lily Sam; *Dr. Julia Ruppell, faculty advisor, Pacific University*
- D-12 "Brain-Cannula Mapping Investigations of Acyl Ghrelin in Metabolic, Limbic, and Reward Signaling" – Hannah Baumgartner, Eliotte Garling, and Lia Zallar; *Dr. Paul Currie, faculty advisor, Reed College*
- D-13 "Impaired Olfaction Decreases Aggression in California Mice (*Peromyscus californicus*)" – Grace Mammarella, Mariah Conley, and Maya Swinehart; *Dr. Bester-Meredith, faculty advisor, Seattle Pacific University*
- D-14 "?Measuring Impulsivity and its Relations to Binge Eating and Obesity in Wistar Rats?" – Amanda Cano, Maia Wen, Mariah Knox, and Dr. Eric Murphy; *Dr. Gwen Lupfer, faculty advisor, University of Alaska Anchorage*
- D-15 "Entraining neural oscillations to influence facial perception" – Rosie Irwin; *Dr. David Andresen, faculty advisor, University of Puget Sound*



- D-16 "Do female Medaka recognize Bisphenol A (BPA) exposed male conspecifics through visual or chemosensory cues?" – Janell O'Leary; *Dr. Siddharth Ramakrishnan, faculty advisor, University of Puget Sound*
- D-17 "Cortisol exposure affects the developing GnRH neural system in zebrafish" – Dominic Skinner; *Dr. Siddharth Ramakrishnan, faculty advisor, University of Puget Sound*
- D-18 "Investigating the impact of early embryonic exposure to titanium dioxide nanoparticles on the developing GnRH neural system" – Natalie Smith; *Dr. Siddharth Ramakrishnan, faculty advisor, University of Puget Sound*
- D-19 "Assessing the role of octopamine in age-dependent learning and developing methods to quantify the neurohormone in bumblebees (*Bombus impatiens*)" – Kailee Weiler; *Dr. Susannah Hannaford, faculty advisor, University of Puget Sound*
- D-20 "Prazosin Disrupts Reconsolidation of Appetitive and Aversive Behavior in Rats" – Kyrie Reyes and Ryan P. Todd; *Dr. Barbara A. Sorg, faculty advisor, Washington State University Vancouver*
- D-21 "Inhibition of RGS proteins in the periaqueductal gray potentiates morphine antinociception in the rat" – Alex Tran, Shauna M. Schoo, and Ram Kandasamy; *Dr. Michael M. Morgan, faculty advisor, Washington State University Vancouver*
- D-22 "Using immunofluorescence and confocal imaging to detect synaptogenesis in rats exploring a complex environment" – Phyong Le, Joshua B. Melander, and Hannah B. Fadenrecht; *Dr. Ginger Withers and Dr. Chris Wallace, faculty advisors, Whitman College*
- D-23 "Immunofluorescent Profiling of Synaptic Density Changes in the Visual Cortex of Rats During Development and Eye Opening" – Ravneet Waraich, Hannah Fadenrecht, and L. Lenhart; *Dr. Ginger Withers and Dr. Chris Wallace, faculty advisors, Whitman College*
- D-24 "Internal Torque Partially Accounts for Proprioceptive Acuity" – Taylor Ostrander; *Dr. Luke Ettinger, faculty advisor, Willamette University*



POSTER E - BIOCHEMISTRY

- E-1 "Bacteria Phage Isolation" – Ian Lorang; *Dr. Daniel Gretch, faculty advisor, Carroll College*
- E-2 "Anthelmintic Natural Products: Investigation of Compounds of *Dalea pogonathera*" – Haley Wolhart and Dr. Blaise Dondji; *Dr. Gil Belofsky, faculty advisor, Central Washington University*
- E-3 "X-ray crystallographic analysis of unknown *Bacillus Cereus* protein reveals nucleotide binding" – Sara Duncan; *Dr. Michael Godsey, faculty advisor, Concordia University - Portland*
- E-4 "Synthesis of a Far-Red Carbazine-based Fluorophore for Protein Tagging" – Samuel Janisse; *Dr. Kimberly Beatty, faculty advisor, George Fox University*
- E-5 "Structural analysis of BcHMGR via chemical cross-linking" – Cierra Dauenhauer and Chad Hicks; *Dr. Jeff Watson, faculty advisor, Gonzaga University*
- E-6 "Elucidating the biosynthetic pathway of rholoquinone in *C. elegans* using RNAi gene knock-downs" – Tyler Schlatter and Shannon Babcock; *Dr. Jennifer Shepherd, faculty advisor, Gonzaga University*
- E-7 "Ion-pair reverse-phase liquid chromatography analysis for separating and quantifying RNA generated via in vitro transcription reactions" – Henry Wienkers; *Dr. Megan Bestwick, faculty advisor, Linfield College*
- E-8 "Exploring mutational strand bias in the yeast *Saccharomyces cerevisiae* to implicate retromutagenesis as a pathway for adaptive mutagenesis" – Chance M. Brock; *Dr. Tina T. Saxowsky, faculty advisor, Pacific Lutheran University*
- E-9 "Quantification of Biofuel Production in *E. coli* via Fluorescence and Instrumental Analysis" – Daniel T. Rekemeyer and Pablo Hernandez Rodriguez; *Dr. Jon O. Freeman, faculty advisor, Pacific Lutheran University*
- E-10 "Inhibition of CYP2A6 as a Smoking Cessation Aid" – Kara Ebisuya; *Dr. John Harrelson, faculty advisor, Pacific University*
- E-11 "Drug-Drug Interactions With Letrozole" – Zachary Mullenax; *Dr. John Harrelson, faculty advisor, Pacific University*
- E-12 "Over-Expression of Cytochrome P450 4A1 from Rat in a Bacterial System" – Erin Yoshida; *Dr. Jeannine Chan, faculty advisor, Pacific University*
- E-13 "Monitoring complex RNA nanoparticle formation using the split-Spinach aptamer" – Sean Morton, Tucker Rodgers, and Dylan Marashi; *Dr. Wade Grabow, faculty advisor, Seattle Pacific University*
- E-14 "Investigation Into the Mechanism of a Heme Peroxidase From the Diatom *Thalassiosira pseudonana*" – Evelyn Bordeaux and Saveeta May Rampur; *Dr. Katherine Frato, faculty advisor, Seattle University*
- E-15 "Development of a Python-based algorithm for comparative analysis of multiparticipant next generation sequencing data" – Thomas Forst, Grace Martz, and Sean Ryan; *Dr. Patrick Murphy, faculty advisor, Seattle University*



- E-16 "Whole exome sequencing analysis predicts potential sources of phenotypic variation in human glucocorticoid signaling" – Grace Martz, Thomas Forst, and Sean Ryan; *Dr. Patrick Murphy, faculty advisor, Seattle University*
- E-17 "Yew Tree Extracts as a Natural Insecticide Against Tobacco Hornworms" – Bao-Tran Nhan and Jin Yun; *Dr. Angela Hoffman, faculty advisor, University of Portland*
- E-18 "The Role of Secondary Metabolite Production in the Host-Pathogen Response of *Drosophila melanogaster* to *Pseudomonas* Infection" – Andrew Leingang (Western Oregon University), Dr. Kristin Latham (Western Oregon University), Dr. Barbara Taylor (Oregon State University), and Dr. Joyce Loper (Oregon State University); *Dr. Patricia Flatt, faculty advisor, Western Oregon University*
- E-19 "Substrate and Nucleophile Characterization of Sortase A Homologs" – Jesse Prelesnik; *Dr. John Antos, faculty advisor, Western Washington University*
- E-20 "A Theoretical Study of Binding Dynamics in the Human Nuclear Receptor Tailless TLX NR2E1 Ligand-Binding Domain" – Bryce Bagley and Dr. Matt Jacobson; *Dr. Kamesh Sankaran, faculty advisor, Whitworth University*
- E-21 "Dimer Disruption of a *Lactobacillus helveticus* Prolyl Dipeptidyl Aminopeptidase (PEPX)" – Evan Barnes; *Dr. Deanna Ojennus, faculty advisor, Whitworth University*
- E-22 "Mercury(II) Inhibits and Denatures Chymotrypsin: Are Histidine Side Chains Involved?" – Amanda Stratton; *Dr. Todd Silverstein, faculty advisor, Willamette University*
- E-23 "Purification of isoprene synthase from *Campylopus introflexus*" – Caleb VanBuskirk and Lara Zetzsche; *Dr. Alison Fisher, faculty advisor, Willamette University*



POSTER F - ORGANIC CHEMISTRY

- F-1 "The Synthesis of Carbazole and Dendron Based Organic Blue Light Emitting Diodes" – Olivia Duletski; *Dr. Caroline Pharr, faculty advisor, Carroll College*
- F-2 "Facile synthesis of biodegradable hydrogels for drug delivery applications" – Emily Foster; *Dr. Jing Hao, faculty advisor, George Fox University*
- F-3 "A Practical Synthesis of (E)-but-2-enedial" – Gregory Hunt; *Dr. Stephen Warren, faculty advisor, Gonzaga University*
- F-4 "Spermine: Biochemical Use in Tissue Processing" – Jacob Neff (Northwest Nazarene University), Dulce Nochebuena (Idaho State University), and Dr. J. Kuster (College of Western Idaho); *Dr. Tim Anstine, faculty advisor, Northwest Nazarene University*
- F-5 "The Synthesis and Characterization of a Reversible Carceplex" – Kyle Nogales; *Dr. Dan Nogales, faculty advisor, Northwest Nazarene University*
- F-6 "Using Lanthanum Chloride to Further Optimize the Synthesis of Functionalized Benzofulvenes and Their Possible Application Towards Thioredoxin Reductase Inhibition and Cancer Treatment" – Katherine E. Caspary; *Dr. Adam C. Glass, faculty advisor, Pacific Lutheran University*
- F-7 "An efficient, safe, and inexpensive new method for oxidation of N-hydroxyureas to Nitroso groups for the hetero-Diels-Alder reaction" – Bryan M. Gutierrez and Christopher S. Erkkila; *Dr. Neal A. Yakelis, faculty advisor, Pacific Lutheran University*
- F-8 "A New, Versatile Route for the Conversion of Sulfonamides to Hydroxyureas for Conjugation to Drug-Releasing Polymers" – Jitkanya Wong; *Dr. Neal A. Yakelis, faculty advisor, Pacific Lutheran University*
- F-9 "Reactivity of Bismuth(III)-Chiral Anion Complexes" – Alyssa Harrison; *Dr. Rebecca LaLonde, faculty advisor, Reed College*
- F-10 "The Search for an Ideal Selective Estrogen Receptor Modulator (SERM)" – Nick Till; *Dr. Rebecca LaLonde, faculty advisor, Reed College*
- F-11 "Attempted synthesis of cyclobutanone by intramolecular Barbier reaction" – Deanna Olson; *Dr. Greg Milligan, faculty advisor, Saint Martin's University*
- F-12 "Attempted peptide synthesis in water using detergents" – Alicia Soto; *Dr. Greg Milligan, faculty advisor, Saint Martin's University*
- F-13 "Synthesis of poly(Hexafluoropropylene Oxide) Vinyl Ether from poly(Hexafluoropropylene Oxide) Methylene Alcohol" – Julia Burgess, Steven Boshart, and Benson Jelier; *Dr. Chadron Friesen, faculty advisor, Trinity Western University*
- F-14 "Investigation of Synthetic Methods for the Preparation of Krytox(R) Perfluoroisopropylene Ether (KPIPE)" – Trevor Burgess and Benson Jelier; *Dr. Chadron Friesen, faculty advisor, Trinity Western University*
- F-15 "Synthesis of Difunctional Hydrofluoro Ethers" – Josiah Newton; *Dr. Chadron Friesen, faculty advisor, Trinity Western University*



- F-16 "Synthesis of antimalarial 2-hydroxy-1,4-naphthoquinones containing 3-alkyl-diphenylether side chains." – Noah Forrest and Amanda Glenn; *Dr. Warren Wood, faculty advisor, University of Portland*
- F-17 "Progress towards the synthesis of 3-acylated-2-hydroxy-1,4-naphthoquinones" – Dylan Nevin; *Dr. Warren Wood, faculty advisor, University of Portland*
- F-18 "Developing catalysts for improving direct amide formation" – Courtney Carley; *Dr. Luc Boisvert, faculty advisor, University of Puget Sound*
- F-19 "Synthesis of ligands and iron precursors to form iron-based hydrogenation catalysts" – Lisa Colombo; *Dr. Luc Boisvert, faculty advisor, University of Puget Sound*
- F-20 "Synthesis of pyridine ligands and iron precursors for the development of iron-based hydrogenation catalysts" – Becky Hanscam; *Dr. Luc Boisvert, faculty advisor, University of Puget Sound*
- F-21 "Optimizing Silk Fibroin Scaffolds for Use as Nerve Conduits" – Emily Sanders; *Dr. Amanda Murphy, faculty advisor, Western Washington University*
- F-22 "Synthesis of a non-covalent macrocyclic peptide inhibitor for the 20S proteasome" – Reed Hendrickson and Mathias Palmer; *Dr. Marion Gotz, faculty advisor, Whitman College*
- F-23 "New Esterification Reactions of the CB11-Carborane Cluster" – Julian Reed; *Dr. Marcus Juhasz, faculty advisor, Whitman College*
- F-24 "New Chlorination Reactions of the CB11 Carborane Cluster" – Austin Shaff; *Dr. Marcus Juhasz, faculty advisor, Whitman College*
- F-25 "Synthesis of Heteroaromatic Tetracaine Derivatives to Enhance Binding Affinity in Cyclic Nucleotide-gated Ion Channels" – Carlo Gangan and Sophia Wax; *Dr. Sarah Kirk, faculty advisor, Willamette University*



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

- G-1 "Does Drainage Affect Diversity with the *Simulium arcticum* complex in Clark Fork Turah?" – Morgan Spear; *Dr. Gerald Shields, faculty advisor, Carroll College*
- G-2 "Peroxide Content of Secondary Organic Aerosol (SOA)" – Ryan Caylor (Concordia University - Portland) and Dr. Jon Shilling (Pacific Northwest National Laboratory); *Dr. Matt Wise, faculty advisor, Concordia University - Portland*
- G-3 "Kinetic studies of the photodegradation of bisphenol derivatives with gold-doped titanium oxide nanoparticles" – Mackenzie McCausland; *Dr. Davida Brown, faculty advisor, George Fox University*
- G-4 "New materials for the chromatographic analysis of interactions at phospholipid bilayer" – Kelley Benck and Noah Powers; *Dr. Eric Ross, faculty advisor, Gonzaga University*
- G-5 "Examination of acid- base-catalyzed silica sol-gels, xerogels, and aerogels containing silver nanoparticles and 4-mercaptobenzoic acid using surface-enhanced Raman spectroscopy" – Tanner Corrado and Dr. Brian Gilbert; *Dr. Elizabeth Atkinson, faculty advisor, Linfield College*
- G-6 "Quality control and analysis for smallbreweries" – Brenna Gomez; *Dr. Brian Gilbert, faculty advisor, Linfield College*
- G-7 "Physical characterization of organically modified polyoxometalates through Langmuir-Blodgett deposition and fluorescence microscopy" – Joseph Perryman and R. Carlisle Chambers; *Dr. Elizabeth Atkinson, faculty advisor, Linfield College*
- G-8 "Examination of DAPI in Silica Gels through Fluorescence Spectroscopy" – Nalea Trujillo; *Dr. Elizabeth Atkinson, faculty advisor, Linfield College*
- G-9 "Effect of ZnO morphology on the photodegradation of malachite green oxalate." – Stephen Bryant; *Dr. Jerry Harris, faculty advisor, Northwest Nazarene University*
- G-10 "Investigating Interaction between CdSe Nanocrystals and Dithiocarbamate Ligands" – Caleb J. Chandler and Matthew C. Garling; *Dr. Andrea M. Munro, faculty advisor, Pacific Lutheran University*
- G-11 "Order Disorder Transition Temperatures of Dicarboximide Functionalized Oxanorbornyl Diblock Copolymers for Solid Polymer Electrolytes for Lithium Ion Batteries" – Sevryn P. Modahl; *Dr. Dean A. Waldow, faculty advisor, Pacific Lutheran University*
- G-12 "Ionic Conductivity of Novel poly(ethylene oxide)-like Brush Homopolymers as Solid Electrolyte Supports for Lithium Ion Batteries" – Colin H. Peterson; *Dr. Dean A. Waldow, faculty advisor, Pacific Lutheran University*
- G-13 "Molecularly Imprinted Polymers: A novel method of mimicking biological catalysts" – Bijoux Doherty, Rikki Gustafson, and Bo Han; *Dr. Joel Gohdes, faculty advisor, Pacific University*
- G-14 "The Use of Powder X-ray Diffraction to Identify Traces of Cosmetics on Textiles" – Renee Hudson; *Dr. Arwyn Smalley, faculty advisor, Saint Martin's University*
- G-15 "Quantitation of Antioxidants Using Silver Nanoparticles" – Christine Knight; *Dr. Arwyn Smalley, faculty advisor, Saint Martin's University*



- G-16 "Quantifying Total Anthocyanin Content in a Variety of Colored Grains" – Nicole Stobel; *Dr. Arwyn Smalley, faculty advisor, Saint Martin's University*
- G-17 "Molecular modelling of a diastereotopic metallophosphorane complex featuring Berry pseudorotation" – Justine Horne, Hannah Carroll, and Noah Reich; *Dr. Craig Montgomery, faculty advisor, Trinity Western University*
- G-18 "XRF and Raman analysis of a 15th-century painting in Mallorca, Spain" – Gisela-Abigail Gonzalez-Montiel, Ryan Bergio, Dr. Ray Bart, Dr. Ronda Bart, and Julio de Paula; *Dr. Valerie Walters, faculty advisor, University of Portland*
- G-19 "2,5-Dihydroxy and 2,5-diamino quinones appended with $\text{P}(\text{O})\text{R}_2$ groups: syntheses, structures, and electrochemical studies" – Madison Lear, Natalie Cawker, Nathan Phan, and Dr. Edward Valente; *Dr. Eugenijus Urnezisus, faculty advisor, University of Portland*
- G-20 "Cu(II) and Ni(II) complexes supported by di(phosphoryl)-appended catechols: electroactive compounds with secondary coordination spheres" – Nathan Phan, Alex Erickson, Rea Cochran, Kelly Ramzy, and Dr. Edward Valente; *Dr. Eugenijus Urnezisus, faculty advisor, University of Portland*
- G-21 "Design and synthesis of a hydrogelator" – Alex Downing; *Dr. Jo Crane, faculty advisor, University of Puget Sound*
- G-22 "Nickel Phosphide Hydrotreating Catalysts on Modified Oxide Supports" – Tess Clinkingbeard; *Dr. Mark Bussell, faculty advisor, Western Washington University*
- G-23 "Developing a surface-enhanced Raman scattering based chemical sensor" – Luke DeGraaff; *Dr. Steven Emory, faculty advisor, Western Washington University*
- G-24 "Organic vapor-liquid-solid growth of organic semiconductor films and devices" – Dane Stanfield, Dr. Janelle Leger, and Dr. Brad Johnson; *Dr. David Patrick, faculty advisor, Western Washington University*
- G-25 "Analysis of multi-phase Iodine solutions" – John Brooksbank; *Dr. Allison Calhoun, faculty advisor, Whitman College*
- G-26 "Potential Speciation of Coral Samples Collected from the Moorea Islands via Protein Analysis" – Maegan Nelson and Rintaro Moriyasu; *Dr. Allison Calhoun, faculty advisor, Whitman College*
- G-27 "Origin of Atmospheric Mercury Deposition in Northwest Alpine Lakes" – Ruth Thirkill, Will Erickson, and Angela Cota; *Dr. Frank Dunnivant, faculty advisor, Whitman College*
- G-28 "Influence of Oxalic Acid on Rates of Ligand Exchange Between Strong Chelating Agents" – Andrew Wildman; *Dr. Nathan Boland, faculty advisor, Whitman College*
- G-29 "Progress Towards Characterization of Pre-Transition Droplets in Liquid-Liquid Binary Systems" – Makayla McKibben and Sawyer Rogers; *Dr. J. Charles Williamson, faculty advisor, Willamette University*
- G-30 "The Photolysis of Halogenated Estrogens in Aquatic Environments" – Kulan Tarnas; *Dr. David Griffith, faculty advisor, Willamette University*



- G-31 "Effect of Internal Torsion on the CH-stretching Overtone Spectra of 2,2'-Substituted Biphenyls" – Elizabeth Knodel and Joe Heindel; *Dr. Daniel Schofield, faculty advisor, Seattle Pacific University*
- G-32 "NMR Kinetics of the Diels-Alder Reactions of 9-Substituted Anthracenes: Development of an Organic Chemistry Lab Experience" – Kira Oyama; *Dr. Andrew Johnson, faculty advisor, Concordia University – Portland*
- G-33 "A Comprehensive Exploration of the Conformational and Energetic Landscape of a Rotaxane System: A Molecular Dynamics Study" – Ken Bodzewski; *Dr. Andrew Johnson, faculty advisor, Concordia University - Portland*
- G-34 "Influence of solution-phase and mesoporous environments on excited state lifetime in 9-mesityl-10-methylacridinium" – Naralya Garcia; *Dr. Tim Kowalczyk, faculty advisor, Western Washington University*
- G-35 "Modeling static correlation in large molecular systems: MCSCF calculations using 2-RDMs" – Truong-Son Nguyen; *Dr. Gergely Gidofalvi, faculty advisor, Gonzaga University*
- G-36 "Non-statistical dynamics in combustion, atmospheric and stellar reactions?" – Lydia Rush, Ismael Rodriguez-Perez, Kyle S. Stumetz, and Jason Nadaeu; *Dr. Matthew Cremeens, faculty advisor, Gonzaga University*



POSTER H - ENVIRONMENTAL SCIENCE / GEOLOGY

- H-1 "Hydrologic constraints on Pacific razor clam habitat at Ninilchik Beach, Kenai Peninsula, Alaska" – Rachel Newell, Bradley Harris, and Jason Geck; *Dr. Amanda King, faculty advisor, Alaska Pacific University*
- H-2 "Geomorphic controls on hyporheic stream temperatures" – Alexis Lucassen; *Dr. Daniel Schindler, faculty advisor, Gonzaga University*
- H-3 "Monosodium urate crystals activate Interleukin-1 signaling pathway to propagate inflammation in THP-1 cells: a possible role in the pathogenesis of gout" – Kayla O'Sullivan (Gonzaga University) and Dr. Anil Singh (Washington State University); *Dr. Salah-Uddin Ahmed, faculty advisor, Gonzaga University*
- H-4 "Automated cloud classification from digital sky images" – Laurel Garrett and David Lovitz; *Dr. Jessica Kleiss, faculty advisor, Lewis & Clark College*
- H-5 "Suspended Sediment Concentration and Hydrochemistry of Glacial Meltwater on Mount Rainier" – Victoria B. Benson; *Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University*
- H-6 "Calculating Atmospheric pCO₂ from Paleosols: Case Study in the Palouse Loess" – Kyle B. Gosnell; *Dr. Alex R. Lechler, faculty advisor, Pacific Lutheran University*
- H-7 "Modern Climate and Soils of the Palouse" – Justin R. Johnsen; *Dr. Alex R. Lechler, faculty advisor, Pacific Lutheran University*
- H-8 "Antarctic Ice Sheets? evolution from the greenhouse Cretaceous Period to the icehouse Quaternary Period" – Adriana J. Peters; *Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University*
- H-9 "Clumped Isotope Thermometry in Pre-LGM Aged Sediments in the Palouse Loess" – Isabellah V. von Trapp; *Dr. Alex R. Lechler, faculty advisor, Pacific Lutheran University*
- H-10 "The Role of Sunlight and Organic Matter in the Degradation of Aquatic Pollutants" – Joe Arguinchona, Kimberly Forster, Rachel McCarthy; *Dr. Douglas Latch, faculty advisor, Seattle University*
- H-11 "Downburst Potential Climatology" – Jaime Hernandez; *Dr. Brian Potter, faculty advisor, College of Idaho*
- H-12 "Atmospheric Impacts on Air Quality in Southwestern Idaho" – Chelsea Walther; *Dr. Sondra Miller, faculty advisor, College of Idaho*
- H-13 "Performance of a Vegetated Roof with Xeric Species in Portland, OR" – Calli VanderWilde and Brooke A. Holmes; *Dr. Ted C. Eckmann, faculty advisor, University of Portland*
- H-14 "Using GIS to Analyze Spatiotemporal Patterns of Industrial Odor Sources and Distributions" – Samantha Wright and Sandra Velasquez; *Dr. Ted C. Eckmann, faculty advisor, University of Portland*
- H-15 "Microorganisms found in a metal-impacted stream, Blackbird Creek, Idaho" – Lena Goss; *Dr. Bryn Kimball, faculty advisor, Whitman College*



- H-16 "It isn't always cloudy in the Pacific Northwest: Characterizing the solar resource and solar irradiance variability" – Nevin Schaeffer (Whitman College), Laura Hinkelman, and Tom Ackerman (University of Washington); *Dr. Barry Balof, faculty advisor, Whitman College*
- H-17 "Phosphorus dynamics in a wetland on the Little Spokane River at Verbrugge Environmental Center, Spokane WA" – Cassandra Hayenga and Mary Walker; *Dr. William Ntow, faculty advisor, Whitworth University*
- H-18 "Framboidal Pyrite Evidence for Prolonged Anoxic and Sulfidic Ocean Conditions Following the End Permian Mass Extinction, Nanpanjiang Basin, South China" – Hana Busse Hopkins; *Dr. Kayja Meyer, faculty advisor, Willamette University*

POSTER I - MICROBIOLOGY

- I-1 "Antibacterial Properties of Green Tea Polyphenols" – Avery Hong and Josh Villaro; *Dr. Mihail Jordanov, faculty advisor, Concordia University - Portland*
- I-2 "High-level disinfection and protection of intravenous catheter ports from bacterial species causing CLABSIs" – Claire Rutledge (Gonzaga University) and Dr. Patrick Tennican (University of Washington); *Dr. William Ettinger, faculty advisor, Gonzaga University*
- I-3 "Diversity of Methane-associated microorganisms of the Columbia River Estuary" – Kaela Jenkins, Mina Kim, Devin Fachko (Pacific University), and Dr. Tawnya Peterson (OHSU); *Dr. Gyorgyi Nyerges, faculty advisor, Pacific University*
- I-4 "Sequence analysis of Class-1 integrons from cattle manure and farm soil" – Derrick Nguyen, Ben Weeder (Pacific University), and Eric Layton (North Powder Charter School); *Dr. Gyorgyi Nyerges, faculty advisor, Pacific University*
- I-5 "Quantitative analysis of antibiotic resistance genes in cattle manure and ranch soil" – Ben Weeder, Derrick Nguyen (Pacific University), and Eric Layton (North Powder Charter School); *Dr. Gyorgyi Nyerges, faculty advisor, Pacific University*
- I-6 "The Discovery and Annotation of a Novel Phage: Jetblade" – Claire Otero and Dr. Ann Koga; *Dr. R. Luke Daniels, faculty advisor, College of Idaho*
- I-7 "Chromosomal Gene Deletions in the TonB2 System of *Vibrio vulnificus*" – Adel Barnes and Elena Roberts; *Dr. Ryan Kustus, faculty advisor, University of Portland*



POSTER J - PHYSICS

- J-1 "The primordial helium abundance" – McKenzie Horner and Emma Peatfield; *Dr. Erik Aver, faculty advisor, Gonzaga University*
- J-2 "Holographic Optical Tweezers to Study Microbubble Dynamics" – Devan Tormey, Irene Duba; *Dr. Shannon O'Leary, faculty advisor, Lewis & Clark College*
- J-3 "Understanding Laser Fluctuations for Atomic Magnetometry" – Ben Whitenack and Aojie Zheng; *Dr. Shannon O'Leary, faculty advisor, Lewis & Clark College*
- J-4 "Complexity and fly swarms" – Grant Cates; *Dr. Joelle Murray, faculty advisor, Linfield College*
- J-5 "Robot Ground Vehicle Design and Construction" – Matthew Dahlin, Yan Mo, and Kuzivakwasher Rusere; *Dr. Tianbao Xie, faculty advisor, Linfield College*
- J-6 "Comparison of Off-the-Shelf UAVs for Agricultural Application" – Esteban Cano; *Dr. Duke Bulanon, faculty advisor, Northwest Nazarene University*
- J-7 "Flexible Electronics Testing on RockSat" – Paul Zukowski; *Dr. Dan Lawrence, faculty advisor, Northwest Nazarene University*
- J-8 "Optical Limiting in Capillary Waveguides Coated with Ag-Nanoparticles" – Cassie Farrell and Michael Park; *Dr. James Butler, faculty advisor, Pacific University*
- J-9 "Enhanced Optical Limiting in Solid Core Photonic Crystal Fibers with Silver Nanoparticles" – Michael Park and Cassie Farrell; *Dr. James Butler, faculty advisor, Pacific University*
- J-10 "Identifying Changes in Health of Trees Under Drought Conditions in the San Joaquin Experimental Range" – Tasha Sitz (College of Idaho), Shane Grigsby (University of Colorado Boulder), and Sean Freeman (Florida State University); *Dr. Susan Ustin, faculty advisor, College of Idaho*
- J-11 "Field Testing of an Accelerometer Instrumented Mouthguard" – Stephanie Petersen, Nick Hazelton, Dr. J.M. Brock, and Dr. John Lund (Western Washington University); *Dr. Anthony Paris, faculty advisor, University of Alaska Anchorage*
- J-12 "Optimization of Solvent-based 3D-printed Polycaprolactone and Hydroxyapatite Matrices for Bone Tissue Engineering" – Kristiana Heinrich; *Dr. Janice McKenzie, faculty advisor, Walla Walla University*
- J-13 "Electrospinning Machine Design and Construction for Development of Nanofiber Scaffolds for Tissue Engineering Applications" – Thomas Lemon; *Dr. Janice McKenzie, faculty advisor, Walla Walla University*
- J-14 "The Design and Construction of a Modular Perfusion Bioreactor for Tissue Culture" – Ryan Thorpe; *Dr. Janice McKenzie, faculty advisor, Walla Walla University*
- J-15 "Electric Propulsion System Optimization for Asteroid Missions" – Hayden Wisniewski; *Dr. Kamesh Sankaran, faculty advisor, Whitworth University*
- J-16 "The Effects of Plasma Shielding on Single Pulse Laser Ablation Experiments" – Peter Warrick; *Dr. Michaela Kleinert, faculty advisor, Willamette University*