MURDOCK
COLLEGE SCIENCE RESEARCH PROGRAM

CELEBRATING AND ENGAGING SCIENTIFIC DISCOVERIES

THE 23rd ANNUAL MCSR CONFERENCE

SPONSORED BY THE M.J. MURDOCK CHARITABLE TRUST

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CO-HOSTED WITH PACIFIC UNIVERSITY OREGON

Pacific University Oregon

23rd Annual MCSR Conference

"Big Science - Small Schools: Transforming Undergraduate Research Through Interdisciplinary Collaboration"

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

MURDOCK
COLLEGE SCIENCE
RESEARCH PROGRAM

Thursday, Nov 13, 2014

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

Friday, Nov. 14, 2014

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

BREAKFAST – Discovery A-E

7:00 - 8:00 a.m. WORKING BREAKFAST - Pine and Spruce rooms (for judges and MCSRP Panel members)

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

- MC – Dr. Moses Lee, *M.J. Murdock Charitable Trust*
- Dr. Lesley Hallick, *President, Pacific University*
- 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. James Butler, *Professor of Chemistry and Director, Pacific University of Undergraduate Research*

SYMPOSIUM ON LIFE SCIENCES
Discovery C/D/E
Presider: Dr. Sara Heggland, *Professor of Biology and Chair, College of Idaho*

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

11:50 a.m. – 1:15 p.m. LUNCH – Discovery Ballroom A-E. Set up posters in Heritage Ballroom.

Noon – 1:00 p.m. LUNCHEON – Pine and Spruce rooms - Administrators, Faculty Members, Staff

1:00 – 4:45 p.m. GRADUATE AND VENDOR FAIR
POSTER PRESENTATIONS AND GRADUATE SCHOOL FAIR

1:15 – 3:00 p.m. POSTER SESSION #1 (A, B, G, H, I) – Heritage Ballroom

3:00 – 4:45 p.m. POSTER SESSION #2 (C, D, E, F, J, K) – Heritage Ballroom

4:45 – 5:00 p.m. TAKE DOWN POSTERS – Heritage Ballroom

4:45 – 5:45 p.m. "ASK A GRADUATE SCHOOL REPRESENTATIVE" SESSION (OPTIONAL).
Hosted by the graduate schools. Pine and Spruce rooms
Ms. Crystal Paredes, *PMCB Coordinator of OHSU, will host.*

6:00 – 8:30 p.m. BANQUET – Discovery Ballroom A-E
Welcome: Dr. Moses Lee
Dr. Lisa Carstens, *Dean, College of Arts and Sciences, Pacific University*
Invocation: Rev. Chuck Currie, *Chaplain, Pacific University*
Voce Femme; Dr. Scott Tuomi, *Professor of Music; Pacific University*

NEAL THORPE MEMORIAL LECTURE: "Building Cells Through Outstanding Undergraduate Research"
Dr. Jenny Ross, *Associate Professor of Physics, University of Massachusetts Amherst*

8:30 p.m. "GET TO KNOW YOUR COLLEAGUES SESSION" for administrators, faculty, and staff. Pine and Spruce rooms. Ms. Kendra Williams, *Director for Faculty Research and Development, Office for Faculty Research and Resources Willamette University*, will host.

Saturday, Nov. 15, 2014

6:45 – 8:00 a.m. BREAKFAST - Discovery A-E

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
Discovery - A/B
Presider: Presider: Dr. Sarah Kirk, *Professor of Chemistry and Chair, Willamette University*

SYMPOSIUM ON LIFE SCIENCES
Discovery C/D/E
Presider: Dr. Donald Powers, *Professor of Biology, George Fox University*

9:20 – 9:40 BREAK – Discovery Foyer East

11:20 a.m. – 12:20 p.m. LUNCH AND CHECK OUT

12:20 – 1:20 p.m. CLOSING/AWARDS – Discovery Ballroom (A-E)

- MC - Dr. Moses Lee, *M.J. Murdock Charitable Trust*
- Dr. Kevin Johnson, *Professor of Chemistry and Associate Dean, Pacific University*
- Dr. Ami Ahern-Rindell, *Associate Professor of Biology, President CUR*
- Dr. John Van Zytveld, *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*

PHYSICAL SCIENCES
ORAL PRESENTATIONS

Nov 14th, Discovery A/B

8:50 AM – 11:50 AM; Presider Dr. James Butler, Pacific University

1. "The Effects of Phthalate Esters on the Development of Parkinsonian-like Symptoms in a Caenorhabditis elegans model" — Jacob Darley; Dr. Lucinda Carnell, *faculty advisor, Central Washington University*

2. "Optimizing Ablation Parameters for an Ultrafast Pulsed Laser" — Alycia Stuart; Dr. Michaela Kleinert, *faculty advisor, Willamette University*

3. "Use of Au Nanoparticle Doped TiO2 for the Photodegradation of Bisphenols" – Luke Rines; Dr. Davida Brown, *faculty advisor, George Fox University*

4. "Toxic Carbon Monoxide Removal by the Soil Bacteria Oligatropha Carboxidavorans: Insights from In Silico Models" — Morgan Dienst; Dr. Dalia Rokhsana, *faculty advisor, Whitman College*

5. "Development of Synthetic Teaching Labs for Crystallographic Analysis" – Owen Phillips; Dr. Louis Kuo, *faculty advisor, Lewis & Clark College*

6. "Evaluation of Electric Propulsion Options for Sample Return Missions to Asteroids and Comets" – Theo Wisniewski and Michael Woodkey; Dr. Kamesh Sankaran, *faculty advisor, Whitworth University*

7. "Identifying and Deciphering the Molecular Mechanisms of MicroRNA-mediated Gene silencing" — Austin Browning and Katherine Rees; Dr. C. Reinke, *faculty advisor, Linfield College*

8. "Structural and Functional Characterization of Circularly Permuted Hemoglobins" — Johann Sigurjonsson and Michael Murphy; Dr. P. Clint Spiegel and Dr. Spencer Anthony-Cahill, *faculty advisors, Western Washington University*

November 15th, Discovery A/B

8:00 AM – 11:20 AM; Presider Dr. Sarah Kirk, Willamette University

9. "PODSat: A CubeSat Designed for 3D Printing and Fabrication on the International Space Station" – Braden Grim, Mitch Kamstra and Keith Moilanen; Dr. Stephen Parke, *faculty advisor, Northwest Nazarene University*

10. "Purification and Characterization of a Bdellovibrio Derived -Glucosidase, malA" — Adrian Simpson; Dr. Jeff Grinstead, Dr. Mark Martin, and Dr. John Hanson, *faculty advisors, University of Puget Sound*

11. "Synthesis and Experimental and Computational Analysis of Curcumin Derivatives and their Difluoroboron Complexes" – Kailey Paavola; Dr. Roxana Ciochina, *faculty advisor, Pacific University*

12. "Inclusion of Small Molecules into Secondary Coordination Spheres of Copper-quinone Complexes: New Reactivity Pathways Untapped" — Alex Erickson and Amanda Graveson; Dr. Eugene Urnezius, *faculty advisor, University of Portland*

13. "Capacitance Detection in the Development of a High Sensitivity Torsion Balance" - Charles Rackson; Dr. Woo-Joong Kim, *faculty advisor, Seattle University*

14. "Diastereotopic Pd(II) and Rh(I) Complexes of the Hydrophosphorane HP(OC6H4NMe)2 with Catalytic Applications" – Hannah Carroll and Fraser Parlane; Dr. Craig Montgomery, *faculty advisor, Trinity Western University*

15. "A New Strategy for the Synthesis of Sulfonamide Drug-Polymer Conjugates" – Christopher S. Erkkila; Dr. Neal A. Yakelis, *faculty advisor, Pacific Lutheran University*

16. "Towards functional characterization of DesD binding interactions" – Caroline Amendola, Iris W. Orion, and Kaitlin M. Wood; Dr. Katherine M. Hoffmann, *faculty advisor, Gonzaga University*

17. "Composition and optical properties of secondary organic aerosol particles" – Ryan Caylor and Felisha Imholt; Dr. John Shilling (Pacific Northwest National Laboratory) and Dr. Matt Wise, *faculty advisors, Concordia University*

LIFE SCIENCES
ORAL PRESENTATIONS

Nov 14th, Discovery A/B

8:50 AM – 11:50 AM; Presider Dr. Sara Heggland, College of Idaho

1. "Further Biochemical Characterization of a Novel Isoprene Synthase from Campylopus introflexus" – Michaelin Richards and Taylor Gee; Dr. Alison Fisher, faculty advisor, Willamette University

2. "Symbiosis between basket stars (Gorgonocephalus eucenemis) and sea whips (Helipterus willemoesi) and its impact on the fishing industry" — Nicholas Tucker and Morgan Busby (NOAA Fisheries); Dr. Bradley Harris, faculty advisor, Alaska Pacific University

3. "Characterizing the Substrate Requirements of P. syringae Effector HopZ3" — Audrey Denman; Dr. Sara Belchik, faculty advisor, Whitman College

4. "Design and Synthesis of Targeted Resveratrol Analogues to Stimulate Re-Endothelialization in Coronary Stent Patients" – Mackenzie Batali and Julian A. Harris; Dr. Casey M. Jones, faculty advisor, Lewis & Clark College

5. "Investigation of Mechanisms Responsible for Reduced Adiponectin mRNA in Adipose Tissue of Nutritionally Programmed Microswine Offspring" - Anh Ngo, Almir Celebic, Alexandra Quackenbush (University of Portland); Dr. Elizabeth DuPriest and Dr. Susan Bagby (Oregon Health & Science University), faculty advisors, Warner Pacific University

6. "How Changes in Plant Community Structure Affect Terrestrial Invertebrate Food Webs"- Dillon Alegre, Henry Simons and Casey Thein; Dr. C. Tillberg, faculty advisor, Linfield College

7. "Changes in Critical Oxygen Pressure of Octopus rubescens in Response to Ocean Acidification"- Lydia Kore; Dr. Kirt Onthank, faculty advisor, Walla Walla University

8. "Antibiotic Resistance Genes in Cattle Ranch Manure and Soil: a Qualitative and Quantitative Analysis" – Ben Weeder; Dr. Gyorgy Nyerges, faculty advisor, Pacific University

9. "Investigating the Mechanism by which Bisphenol A Affects Sustained Movement in the Pond Snail Helisoma trivolvis"- Skyler Tetreau; Dr. Siddharth Ramakrishnan, faculty advisor, University of Puget Sound

November 15th, Discovery A/B

8:00 AM – 11:20 AM; Presider Dr. Don Powers, George Fox University

10. "Differential Sexual Dimorphism in Response to Selection for High Locomotor Activity in os coxae of Mus musculus" – Kjersten Braaten-Fierros and Christopher J. Higginbotham; Dr. Heidi Schutz, faculty advisor, Pacific Lutheran University

11. "Characterization of a Potential Pathogen (E. coli ONT:H25) by Genomic Analysis of Rfb & LEE" — Anthony McDonald and Trevor Smith; Dr. Jennifer Chase, faculty advisor, Northwest Nazarene University

12. "Development of a Nonradioactive Steroid Receptor Ligand Binding Assay Using Fluorescence Polarization" — Nicholas Manlove and Jane Waldens; Dr. Patrick Murphy, faculty advisor, Seattle University

13. "Effects of Retinoic Acid Pathway Manipulation on Zebrafish Eye Development" – Wilson Horner; Dr. Kara Cerveny, faculty advisor, Reed College

14. "Characterization of a Tertiary Interaction Found in the Tetrahydrofolate (THF) Riboswitch" — Madison Strawn; Dr. Ryan P. Ferrer and Dr. Karisa Pierce, faculty advisors, Seattle Pacific University

15. "The Effects of Autonomy and Regeneration on Fecundity in the Purple Shore Crab (Hemigrapsus nudus)" – Ryan Kain and Clayton Steed; Dr. Tara Maginnis, faculty advisor, University of Portland

16. "Beetle weapons: allometric scaling of biomechanical components of male stag beetle mandibles" – Maria Mills and Rahmi Nemri; Dr. Brook O. Swanson, faculty advisor, Gonzaga University

17. "Acetylcholinesterase and Metallothionein as Bioindicators of Contaminant Exposure in Signal Crayfish, (Pacifastacus leniusculus)" –- Juan Cervantes, Laura L. Holden, Connor Lineberger, and Collin H. Clovis; Dr. Mark P. Gunderson, faculty advisor, College of Idaho

Poster A Presentations

A-1 "Attendance patterns of Steller sea lions (Eumetopias jubatus) on Kozlova Cape, Russia" – Rachel Fox; Dr. Leslie Cornick, faculty advisor, Alaska Pacific University

A-2 "Population Genetics of the tick, Dermacentor andersoni, based on the Mitochondrial 16S Gene" – Seth Dotson; Dr. Jennifer Geiger, faculty advisor, Carroll College

A-3 "Comparison of West Nile Virus infection rates in Cx. tarsalis and horses in Montana using RT-PCR and ELISA" – Sarah Fitzpatrick; Dr. Sam Alvey, faculty advisor, Carroll College

A-4 "Carrier Rate of Colorado Tick Fever in the Rocky Mountain Wood Tick" – Blake Jordan; Dr. Sam Alvey, faculty advisor, Carroll College

A-5 "Characterizing the jasmonate response of the coi1-17 Arabidopsis thaliana mutant" – Robert Filley and Kelsey Johnson; Dr. Neva L. Laurie-Berry, faculty advisor, Pacific Lutheran University

A-6 "Biogeography of Campanula scouleri: Exploring Biotic and Abiotic Constraints" – Gavin Miller; Dr. Rosemarie C. Haberle, faculty advisor, Pacific Lutheran University

A-7 "Isolation and characterization of a potential allelochemical in Russian olives" – Amy Bump; Dr. Dan Albrecht, faculty advisor, Rocky Mountain College

A-8 "Effects of non-native species on soil microbial community activity" – Ksenia Lynch; Dr. Dan Albrecht, faculty advisor, Rocky Mountain College

A-9 "West Nile Virus Surveillance in Western Montana" – Diane Harrison; Libby Rutledge, faculty advisor, Salish Kootenai College

A-10 "Estimating population size of black-tailed on Blakely Island, Washington" – Jubilee Brenneman and Allison Cutting; Dr. Eric Long, faculty advisor, Seattle Pacific University

A-11 "Studies on surfactants in Sapindus saponaria in Honduras" – Isabella Ditrocchio; Dr. Paul Brown, faculty advisor, Trinity Western University

A-12 "Age and size structure of invasive bass and sunfish populations sampled by electrofishing" – Andrew Tung; Dr. David Clements, faculty advisor, Trinity Western University

A-13 "Effects of nitrogen and phosphorus additions on Oregon tidal wetland primary producer and macroinvertebrate communities" – Kristen Jakstis and Deanna Williams; Dr. Christine Weilhoefer, faculty advisor, University of Portland

A-14 "Don't Poo Where You Eat: Location of Pearsonothuria graeffei Egesta in a Tropical Coral Reef Environment" – Liesl Cole and Carly Leggitt; Dr. Jim Nestler, faculty advisor, Walla Walla University

A-15 "Call doctor cucumber: association between sea cucumbers and a reduction of tropical coral disease" – Leah Dan and Carly Leggitt; Dr. Jim Nestler, faculty advisor, Walla Walla University

A-16 "A Demographic Study of Joshua Tree's Response to Climate Change" – Malia Santos; Dr. Chris Smith, faculty advisor, Willamette University

A-17 "Are Joshua Trees Undergoing Range Expansion?: A Study Through a Population Genetic Lens" – Furey Stirrat; Dr. Chris Smith, faculty advisor, Willamette University

A-18 "Yucca Moths Show a Break-Down of Host Specificity in the Tikaboo Valley Hybrid Zone" – Jackson Waite-Himmelwright; Dr. Chris Smith, faculty advisor, Willamette University

A-19 "Plant Gossip: Communication between ramets of Solanum Dulcamara during an herbivore attack" – Stacy Friscia; Dr. Stacey Halpern, faculty advisor, Pacific University

A-20 "Using marine polychaete worms as indicators of benthic sediment size, type, and pollutant levels in Commencement Bay, WA" – Nicholas Cochran; Dr. Peter Hodum, faculty advisor, University of Puget Sound

A-21 "Breeding and foraging behavior of Pigeon Guillemots (Cepphus columba) as biological indicators of coastal marine health in Puget Sound, WA" – Kieran O'Neil; Dr. Peter Hodum, faculty advisor, University of Puget Sound

A-22 "The effect of size on interference competition and field distribution of two sea star species in Puget Sound" – Haila Schultz; Dr. Joel Elliott, faculty advisor, University of Puget Sound

A-23 "Lethal and sublethal effects of several miticides on the beneficial predatory mite Phytoseleius persimili" – Meghan Malloy; Dr. Heidi Dobson, faculty advisor, Whitman College

A-24 "The Size of Male Reproductive Organs Across the Flight Season in the Solitary Bee Megachile rotundata" – Elena Aragon; Dr. Heidi Dobson, faculty advisor, Whitman College

A-25 "Can Subtle Differences in Thermal Landscapes Impact Energy Expenditure in Migratory Hummingbirds" – Noemi Camacho; Dr. Don Powers, faculty advisor, George Fox University

A-26 "Changes in Hummingbird Daily Energy Expenditure Along an Elevational Gradient" – Joseph Canepa; Dr. Don Powers, faculty advisor, George Fox University

A-27 "Genetic structure of fisher (Pekania pennanti) populations in southern Vermont" – Stephanie Ingle and Meike Lobb-Rabe; Dr. Mark Jordan, faculty advisor, Seattle University

A-28 "Landscape resistance maps for analyzing movements of raccoons (Procyon lotor) and Virginia opossums (Didelphis virginia) in Seattle" – Dylan Rich; Dr. Mark Jordan, faculty advisor, Seattle University

A-29 "Does Forest Diversity Influence Start of Season Variability?" – Sacha Clow, Anneliese Immel, and Kristen Schoenike; Dr. Grant Casady, faculty advisor, Whitworth University

A-30 "Bridging behavior among adult female Tibetan macaques (Macaca thibetana)" – Grant Clifton; Dr. Jianhua Li (Anhui University, China) and Dr. Lori Sheeran, faculty advisors, Central Washington University

A-31 "The genetic basis for trichome production in Mimulus guttatus" – Samantha Neuffer; Dr. Alison Scoville, faculty advisor, Central Washington University

A-32 "From rice fields to wheat fields: modeling the effects of herbivore and predator vitality on crop yields" – Allison Fisher; Dr. Sergey Lapin (Washington State University) and Dr. Bonni Dichone, faculty advisors, Gonzaga University

A-33 "An investigation of the origin and social status of acorn woodpecker immigrants using DNA microsatellite markers" – Brock Nelson; Dr. Joey Haydock, faculty advisor, Gonzaga University

A-34 "The response of Lupinus to post-fire artificial nitrogen fertilization" – Mari Schramm; Dr. Dave W. Peterson (USFS PNW Forestry Sciences Lab), faculty advisor, Gonzaga University

A-35 "DNA extracted from eggs allows study of sexual selection in the acorn woodpecker" – Laura Seifert and Kathryn Uppendahl; Dr. Joey Haydock, faculty advisor, Gonzaga University

A-36 "Dalmatian toadflax (Linaria dalmatica) ramet detection and recolonization by the stem-mining weevil (Mecinus janthiniformis)" – Braeden Van Deynze, Rebecca Velasco, and Alexander Dickman; Dr. Gary Chang, faculty advisor, Gonzaga University

A-37 "Tardigrade Diversity of Kwina Woods, WA" – Rosa Hunter; Dr. John Rombold, faculty advisor, Northwest Indian College

DEVELOPMENTAL BIOLOGY / PHYSIOLOGY

B-1 "Using Glycosylated Hemoglobin and Heat Shock Protein 70 as Thermal Biomarkers in American Pikas, Ochotona princeps" – Steve Edmonds; Dr. Brandon Sheafor, faculty advisor, Carroll College

B-2 "The Effect of Creatine Supplementation on Muscle Strength and Endurance in the Mouse" – David Howden; Dr. Sarah Comstock, faculty advisor, Corban University

B-3 "The Effect of High Sucrose Intake on Glucose Metabolism in the Mouse Pancreas" – Jared Wagoner; Dr. Sarah Comstock, faculty advisor, Corban University

B-4 "3D Echocardiography Based Evaluation of Ventricular Septal Defect" – Evan Tracy; Dr. David Sahn, faculty advisor, Linfield College

B-5 "Investigating the origins of the ciliary marginal zone, a stem cell niche" – Alison Bryant; Dr. Kara Cerveny, faculty advisor, Reed College

B-6 "Effects of gdf6a knockdown on Hedgehog target gene expression in the developing zebrafish retina" – McKenzie Givens; Dr. Kara Cerveny, faculty advisor, Reed College

B-7 "Saxitoxin and the ochre sea star: Molecule of keystone significance and a classic keystone species" – Camillo Candido; Dr. Karisa Pierce and Dr. Ryan Ferrer, faculty advisors, Seattle Pacific University

B-8 "Comparing Preferred and Optimal Walking Speeds" – Carmen Hove; Dr. Cara Wall-Scheffler, faculty advisor, Seattle Pacific University

B-9 "Manipulations of AVP and Olfaction Lead to Variations in Parental Care and Aggression in California Mice" – Grace Mammarella, Maya D. Swinehart, and Melissa E. Row; Dr. Janet K. Bester-Meredith, faculty advisor, Seattle Pacific University

B-10 "Do kinematics signal energetic optimality? Evidence from human walking studies" – Maya Thetford; Dr. Cara Wall-Scheffler, faculty advisor, Seattle Pacific University

B-11 "The Physiological Effects of Seastar Wasting Syndrome on Mytilus edulis" – Haley Vincent and Camillo Candido; Dr. Ryan Ferrer, faculty advisor, Seattle Pacific University

B-12 "Evaluation of the role of unc-53 and Wnt signaling in the outgrowth of the excretory cell in C. elegans" – Vanessa Porter; Dr. Eve Stringham, faculty advisor, Trinity Western University

B-13 "Increased Sensitivity to Growth Hormone in Juvenile Low Protein Microswine Offspring" – Alex Quackenbush, Almir Celebic (Warner Pacific College), Anh Ngo (Warner Pacific College), and Brianna Cowin (Warner Pacific College); Dr. Elizabeth DuPriest (Warner Pacific College), Dr. Susan Bagby (Oregon Health and Science University) and Dr. Susan Murray, faculty advisor, University of Portland

B-14 "Quieting the Kraken: Ocean Acidification effects on Octopus rubescens growth, feeding, and respiration" – Taylir Schrock and Lydia Kore; Dr. Kirt Onthank, faculty advisor, Walla Walla University

B-15 "Reduced Plasma Adiponectin is Associated with Altered Beta-Adrenergic Signaling in Adipose Tissue of Nutritionally Programmed Microswine Offspring" – Almir Celebic, Anh Ngo, and Alexandra Quackenbush (University of Portland); Dr. Susan Bagby (Oregon Health and Science University) and Elizabeth DuPriest, faculty advisor, Warner Pacific College

B-16 "Effect of Hemodynamic Forces on Fibrillin and Elastin Composition in the Embryonic Chicken Outflow Tract" – Brianna Cowin and Madeline Midgett (Oregon Health and Science University); Dr. Sandra Rugonyi (Oregon Health and Science University), faculty advisor, Warner Pacific College

B-17 "Nicotine: Development and Cross Resistance in Drosophila melanogaster" – Jennifer Lakeman and Ariel Shaw (Cleveland High School); Dr. Norma Velazguez-Ulloa, faculty advisor, Lewis & Clark College

B-18 "The Effect of Developmental Exposure to Nicotine on Neurotransmitter Expression in Drosophila melanogaster" – Melanie Morris and Jenni Lakeman; Dr. Norma Velazquez-Ulloa, Lewis & Clark College

B-19 "Investigating the role of programmed cell death in the developing zebrafish hindbrain" – Maritte O'Gallagher and Zachary J. C. Tobias; Dr. Tamily A. Weissman, faculty advisor, Lewis & Clark College

B-20 "Characterization of glutathione in signal crayfish, Pacifastacus leniusculus, as an indicator of contaminant exposure in southwestern Idaho aquatic ecosystems" – John French, Laura L. Holden, and Brandon T. Nguyen; Dr. Mark P. Gunderson, faculty advisor, College of Idaho

B-21 "Phase I and Phase II Detoxification Enzyme Activity in Signal Crayfish, Pacifastacus leniusculus, Inhabiting the Boise River System" – Jessica Hansen, Brandon T. Nguyen, and Laura L. Holden; Dr. Mark P. Gunderson, faculty advisor, College of Idaho

B-22 "Bisphenol A affects early embryonic development in the pond snail Helisoma trivolvis" – Dominic Skinner; Dr. Siddharth Ramakrishnan, faculty advisor, University of Puget Sound

B-23 "The metabolic cost of possessing a sexually selected trait: Insights from male fiddler crabs" – Corinne Straube; Dr. Alexa Tullis, faculty advisor, University of Puget Sound

B-24 "Climate-Change Response: The Impact of Solar Radiation on Hummingbirds at Mid and High Elevations" – Sara Nutter; Dr. Don Powers, faculty advisor, George Fox University

B-25 "Does High Nighttime Temperature Reduce the Energetic Value of Torpor in Hummingbirds?" – Rebecca Schroeder; Dr. Don Powers, faculty advisor, George Fox University

B-26 "Pathways of Anticoagulation in the Failing Mouse Heart" – Alicia Hayes; Dr. Wohaib Hasan, faculty advisor, Concordia University

B-27 "The effects of juvenile hormone and ecdysone on the development of head horns of the asian rhinoceros beetle" – Aurora Kraus, Robert Zinna (Washington State University), and James Hust (Washington State University); Dr. Laura Lavine (Washington State University), faculty advisor, Gonzaga University

B-28 "Beetle weapons: allometric scaling of biomechanical components of male stag beetle mandibles" – Maria Mills and Rahmi Nemri; Dr. Brook O. Swanson, faculty advisor, Gonzaga University

B-29 "To each his own: a comparison of strength and beauty among male fiddler crabs (Uca) around the world" – Sarin (Putter) Tiatragul; Dr. Brook O. Swanson, faculty advisor, Gonzaga University

MOLECULAR AND CELL BIOLOGY

C-1 "The Role of DCTN-2 in trafficking of GluR-2-containing AMPA Receptors" – Mark Barnett; Dr. Stefanie Otto-Hitt, faculty advisor, Carroll College

C-2 "Investigating the Role of Olfm1 in the trafficking of GluR2-containing AMPA Receptors" – Caroline Cardenas; Dr. Stefanie Otto-Hitt, faculty advisor, Carroll College

C-3 "Identifying a new gene required for microRNA-mediated gene silencing in Drosophila melanogaster" – Kameron Bates, Michael Morin, and Damien Cannon; Dr. C. Reink, faculty advisor, Linfield College

C-4 "A comparative genomic analysis of the Drosophila dot chromosome" – James Knox, Tika Zbornik, and Rhese Thompson; Dr. C. Reinke, faculty advisor, Linfield College

C-5 "DMSP localization in the macroalga, Ulva lactuca, by immunofluorescence microscopy" – Reed Hawkins, Reyn M. Kenyon; Dr. Timothy A. Nelson and Dr. Richard L. Ridgway, faculty advisors, Seattle Pacific University

C-6 "Identifying Homologs of Conserved Germline Development Proteins in Tardigrades?" – Cara Lord and Patrick Nielsen; Dr. Jenny Tenlen, faculty advisor, Seattle Pacific University

C-7 "Unraveling the Genome of Agrobacterium rhizogenes A4" – Genevieve Roberts; Dr. Katey Houmiel and Dr. Derek Wood, faculty advisors, Seattle Pacific University

C-8 "Integrin-Linked Kinase Regulates Senescence in a Rb-Dependent Manner in Cancer Cell Lines" – Rose Duminico, Jake Noble, Joseph Goody, M. Sharma (Vancouver Coastal Health Research Institute, Vancouver, BC), and M.E. Cox (Vancouver Coastal Health Research Institute, Vancouver, BC); Dr. Julia Mills, faculty advisor, Trinity Western University

C-9 "The role of septate junction loci Lachesin, Discs-large, Scribbled and Neurexin IV in frizzled-independent tissue patterning in Drosophila" – Laura Holland; Dr. Dennis Venema, faculty advisor, Trinity Western University

C-10 "Loukoumasomes and Rods and Rings are Distinct Subcellular Structures in Retinal Cell Lines" – Jake Noble, Joseph Goody, and E.K. Chan (University of Florida, Gainesville); Dr. Julia Mills, faculty advisor, Trinity Western University

C-11 "How are MAPK pathway and downstream proteins affected in a B-Raf knock-out mouse?" – Sara McCrohan; Dr. Natasha Chattergoon (Oregon Health and Science University) and Dr. Susan Murray, faculty advisors, University of Portland

C-12 "The role of LmcA at the growth-to-development transition" – Daniel Gross; Dr. David Lindsey, faculty advisor, Walla Walla University

C-13 "AprA Effects on Dictyostelium Pseudopods" – Christopher Lindsey; Dr. Richard Gomer, faculty advisor, Walla Walla University

C-14 "Slingshot is Required During Multiple Stages in the Development and Growth of Ovarian Follicles in Drosophila" – Austin Guimond and Serena Meng; Dr. Jason Duncan, faculty advisor, Willamette University

C-15 "Visualizing -synuclein aggregation in living zebrafish to test mechanisms of Parkinson's Disease pathogenesis" – Teresa Stackhouse, Leah J. Weston, Zachary J.C. Tobias, Valerie R. Osterberg (Oregon Health & Science University), and Vivek K. Unni (Oregon Health & Science University); Dr. Tamily A. Weissman, faculty advisor, Lewis & Clark College

C-16 "Human pantothenate kinase silencing by siRNA in HeLa cells" – Megan Chalupsky; Dr. Randall Woltjer (Oregon Health & Science University) and Dr. Lisa Sardinia, faculty advisors, Pacific University

C-17 "Characterizing Molecular Death Mechanisms induced by Aminolevulinic Acid-Mediated Photodynamic Therapy in Human Osteosarcoma Cells" – Mary Roberts; Dr. Paige Baugher, faculty advisor, Pacific University

C-18 "The affect of large mtDNA deletion mutations on Caenorhabditis elegans nematode health and fitness" – Erin Helms and Carly Percell; Dr. Katie Clark, faculty advisor, Pacific University

C-19 "Proteomic analysis of red light induced Phytochrome A response in Solanum lycopersicum mutant" – Drew Anderson; Dr. Andeas Madlung, faculty advisor, University of Puget Sound

C-20 "Evolutionary and functional investigation of the abnormal oocyte gene in Drosophila" – Chris Large; Dr. Harmit Malik, faculty advisor, University of Puget Sound

C-21 "Using Drosophila melanogaster to identify a novel gene with a potential role in cancer" – Stephan Raiders; Dr. Leslie Saucedo, faculty advisor, University of Puget Sound

C-22 "Uncovering Patterns in Duplicate Gene Evolution: Using qPCR Analysis to Determine Myb4 and Myb5 Expression Patterns in M. l. luteus and M. l. variegatus" – Philip Cheng; Dr. Arielle Cooley, faculty advisor, Whitman College

C-23 "CaM Kinase Regulation of P53 in Breast Cancer Cells" – Cody Coblentz; Dr. John M. Schmitt, faculty advisor, George Fox University

C-24 "Comparative growth analysis of malaria parasite, Plasmodium falciparum, using 3H-Hypoxanthine incorporation and SYBR green fluorescence" – Kyleray Katherman; Dr. Heather Ayala, faculty advisor, George Fox University

C-25 "Estrogen Increases Osteoblast Survival via CaM Kinases" – Hope Kenyon; Dr. John M. Schmitt, faculty advisor, George Fox University

C-26 "Potential Genetic Etiology of Chronic Vestibulitis" – Joshua Miles; Dr. Jim Smart, faculty advisor, George Fox University

C-27 "AKAP7 Regulates ERK Activation in Breast Cancer Cells" – Nicole Park; Dr. John M. Schmitt, faculty advisor, George Fox University

C-28 "Variation in the effects of Angiotensin II on respiration in prostate (LNCaP) and breast (MDA) human cancer cell lines" – Anna Reister; Dr. Jeff Duerr, faculty advisor, George Fox University

C-29 "A structure, function analysis of Zinc Finger Protein 462 using truncated clones" – Joel Rurik; Dr. Anthony P. Barnes (Oregon Health and Science University) and Dr. Jim Smart, faculty advisors, George Fox University

C-30 "Investigating inter-patient genetic variability in HSP90AB1 affecting cortisol response and subcellular localization of hsp90" – Thomas Forst, Rose Lassalle-Klein, and Rachel Knox; Dr. Patrick Murphy, faculty advisor, Seattle University

C-31 "Nucleotide Dependency of the HSP90/HSP70 Based Chaperone Machinery Formation and Association with GR" – Gabe Kaemingk and Deanna Marie Molenda; Dr. Patrick Murphy, faculty advisor, Seattle University

C-32 "Characterizing the Effects of Chronic Use of the Non-Nutritive Sweeteners, Aspartame and Sucralose, on the Immune System" – Marissa Cruz; Dr. Blaise Dondji, faculty advisor, Central Washington University

C-33 "Evaluation of the toxicity to mammalian cells of plant extracts with anthelminthic activity" – Jocelyn McCornack; Dr. Blaise Dondji, faculty advisor, Central Washington University

C-34 "Characterizing JAtY clones for use in molecular complementation studies to identify the PGA1 gene in Arabidopsis thaliana" – Mosa Charles; Dr. Margaret Olney, faculty advisor, St. Martin's University

C-35 "Mutations that suppress an aneuploid phenotype in yeast" – Anne MacKenzie; Dr. Kirk Anders, faculty advisor, Gonzaga University

C-36 "Conferring aphid resistance to potatoes through genetic enhancement" – Annalise McInelly; Dr. Marianne Poxleitner, faculty advisor, Gonzaga University

NEUROSCIENCE / PSYCHOLOGY / EXERCISE SCIENCE

D-1 "Early Identification of ADHD Risk via Infant Temperament and Emotion Regulation" – Ashley Barling; Dr. Elinor Sullivan, faculty advisor, University of Portland

D-2 "Exposure to High-Fat Diet During Early Development Impacts Peer-to-Peer Interactions" – Kelly Christiansen; Dr. Elinor Sullivan, faculty advisor, University of Portland

D-3 "The Impact of Maternal High Fat Diet and Obesity on Offspring Behavior" – Kellie Riper; Dr. Elinor Sullivan, faculty advisor, University of Portland

D-4 "Characterization of Costicosterone Induced Eletrophysiological Modulation of Hindbrain Neurons in Male Roughskin Newts, Taricha granulosa" – Jonathan Saunders; Dr. Emma Coddington, faculty advisor, Willamette University

D-5 "Group Motivation Increases Fitness Activity Using Fitbit Activity Trackers" – Noah Callaghan, Susan Heinselman, Joel Schooler, and Elijah Rebensdorf (Mount Hood Community College); Dr. Erik Nilsen, faculty advisor, Lewis & Clark College

D-6 "Neurochemical identification of pain-modulatory projection neurons from the parabrachial region to the rostral ventromedial medulla" – Lacey Hallquist; Dr. Amber Buhler, faculty advisor, Pacific University

D-7 "Confirmation of glutamatergic and GABAergic neurons expressing nitric oxide synthase in pain-modulatory regions of the rostral ventromedial medulla" – Sean Tachibana; Dr. Amber Buhler, faculty advisor, Pacific University

D-8 "Effects of voluntary wheel running & detraining on hindlimb muscle tissue in rats" – Emily Brown; Dr. J.P. Hyatt (Georgetown University) and Dr. Gary McCall, faculty advisors, University of Puget Sound

D-9 "Theory of mind, mirror neurons, and literary fiction" – Olivia Cadwell; Dr. David Andresen and Dr. Catherine Hale, faculty advisors, University of Puget Sound

D-10 "Immunofluorescent Profiling of Synaptic Density Changes in the Visual Cortex of Rats During Development" – Hannah Fadenrecht; Dr. Ginger Withers, faculty advisor, Whitman College

BIOCHEMISTRY

E-1 "Developing an analytical method for separating and quantifying RNA generated in in vitro transcription reactions" – Henry Wienkers; Dr. Megan Bestwick, faculty advisor, Linfield College

E-2 "Yeast Survival in Different Concentrations of Canavanine" – Pannapat Angkanaworakul; Dr. Tina M. Saxowsky, faculty advisor, Pacific Lutheran University

E-3 "Developing Methodology for the Screening of ssDNA Aptamers Against Human Squalene Synthase" – Inga Christensen and Cameron J. Dunn; Dr. Jon O. Freeman, faculty advisor, Pacific Lutheran University

E-4 "Defects in Transcription and the Effect on Retromutagenesis Frequencies" – Mackenzie Deane; Dr. Tina M. Saxowsky, faculty advisor, Pacific Lutheran University

E-5 "Does exposure to canavanine cause an increase in oxidative stress in Saccharomyces cerevisiae?" – Jessika Iverson; Dr. Tina M. Saxowsky, faculty advisor, Pacific Lutheran University

E-6 "Monitoring nanoparticle self-assembly using a bifurcated fluorescent aptamer" – Tucker Rogers and Dylan Marashi; Dr. Wade Grabow, faculty advisor, Seattle Pacific University

E-7 "Characterization of a tertiary interaction found in thetetrahydrofolate (THF) riboswitch" – Kelli Wilner and Dustin Kress; Dr. Wade Grabow, faculty advisor, Seattle Pacific University

E-8 "Eastern Filbert Blight resistance in two hazelnut cultivars" – Maggie Hoang and Natalie Lee; Dr. Angela Hoffman, faculty advisor, University of Portland

E-9 "Sustained delivery of the chemokine CXCL12 from chemically modified silk hydrogels" – Paige Atterberry; Dr. Amanda Murphy, faculty advisor, Western Washington University

E-10 "Crystallization and structure determination of blood coagulation factor VIII" – Amanda Weis; Dr. P. Clint Spiegel, faculty advisor, Western Washington University

E-11 "Characterization of an Isoprene Synthase from Heath Star Moss (Campylopus introflexus)" – Taylor Gee; Dr. Alison Fisher, faculty advisor, Willamette University

E-12 "Half Maximal Inhibitory Concentration of the Wild Type Proprotein Convertase 1 Propeptide" – James Brandt and Joshua Martwick (Beaverton Health and Science High School); Dr. Ujwal Shinde, faculty advisor, Lewis & Clark College

E-13 "Ketoconazole Activates CYP 3A4-mediated Metabolism of Letrozole" – Stephen Black: Dr. Jeannine Chan and Dr. John Harrelson, faculty advisors, Pacific University

E-14 "Development of a reconstituted assay system for cytochrome P450 2A6" – Mandeep Nagi; Dr. John Harrelson and Dr. Jeannine Chan, faculty advisors, Pacific University

E-15 "Purification and characterization of a Bdellovibrio derived -glucosidase, malA" – Adrian Simpson; Dr. Jeff Grinstead, Dr. Mark Martin, and Dr. John Hanson, faculty advisors, University of Puget Sound

E-16 "Comparison of Substrate Binding and Specificity in 2,6-dichlorohydroquinone-1,2-dioxygenase (PcpA) and catechol-2,3-dioxygenase (XylE)" – Emma Altman and Julia Burrows; Dr. Timothy Machonkin, faculty advisor, Whitman College

E-17 "Drug-Delivery Devices for ARV Combinations" – Alaina Bever and Mikaela E. Ebner; Dr. Ian T. Suydam, faculty advisor, Seattle University

E-18 "Prone To Dimerize? Exploring the Role of Integrase in Foamy Virus Polymerase Dimerization" – Cooper Hayes, Joe Semeniuk, and Jacqui Wallis; Dr. Carolyn Stenbak, faculty advisor, Seattle University

E-19 "The Characterization of WhiA: A study of the structure and function of a bacterial transcription regulator" – Bradley Walker; Dr. Brett Kaiser, faculty advisor, Seattle University

E-20 "Effects of Site-Directed Mutagenesis on Structure and Function of an X-Prolyl Peptidase (PEPX)" – Andrew Bloom and Naji Saker; Dr. Deanna Ojennus, faculty advisor, Whitworth University

E-21 "Towards functional characterization of DesD binding interactions" – Caroline Amendola, Iris W. Orion, and Kaitlin M. Wood; Dr. Katherine M. Hoffmann, faculty advisor, Gonzaga University

E-22 "Investigation of the effect of methyl jasmonate on cocaine production in Erythroxylum coca" – Aspen Hirsch; Dr. Marianne Poxleitner, faculty advisor, Gonzaga University

E-23 "Increasing therapeutic payload via dendrimeric linkage" – Kelly Laird; Dr. John M. Pagel (Fred Hutchinson Cancer Research Center), Dr. Oliver W. Press (Fred Hutchinson Cancer Research Center), and Dr. Chen Fang (Fred Hutchinson Cancer Research Center), faculty advisors, Gonzaga University

E-24 "Elucidating the substrate specificity of Pvs synthetases, key enzymes in the biosynthesis of a stealth siderophore" – Carolina Montufar and Savannah Bukant; Dr. Katherine M. Hoffmann, faculty advisor, Gonzaga University

E-25 "Analysis of rhodoquinone production in knockout strain candidates ΔRru_A3231 and ΔRru_A1274 of Rhodospirillum rubrum" – Benjamin Titus; Dr. Jennifer Shepherd, faculty advisor, Gonzaga University

E-26 "Identification of genes involved in rhodoquinone biosynthesis in C. elegans using RNAi knockdowns" – Helen Xun; Dr. Jennifer Shepherd, faculty advisor, Gonzaga University

ORGANIC COMPUTATIONAL CHEMISTRY

F-1 "Synthesis and Electrochemical Characterization of 2-Pyrene-Thiophene for use in Visible Light Initiated Oxidative Dimerization Reactions to Store Energy in Carbon-Carbon Chemical Bonds" – Erin Hanson; Dr. John Rowley, faculty advisor, Carroll College

F-2 "Building a Molybdenum Complex: An Organometallic Approach to CO2 Activation" – Kathleen Berge; Dr. Eric E. Finney, faculty advisor, Pacific Lutheran University

F-3 "The Potential of Donor-Acceptor Cyclopropanes to Activate Carbon Dioxide" – Alice Henderson; Dr. Eric E. Finney, faculty advisor, Pacific Lutheran University

F-4 "Ring Strain and Retro-Diels-Alder Reactions: Thermally-Controlled Release of Molecular Cargo" – Brock Lynde and Dylan A. Nehrenberg; Dr. Neal A. Yakelis, faculty advisor, Pacific Lutheran University

F-5 "Progress towards the synthesis of 2-hydroxy-1,4-naphthoquinones containing 3-alkyl-diphenylether side chains" – Matthew Chavarria; Dr. Warren Wood, faculty advisor, University of Portland

F-6 "Controlling the 3D structure of conducting polymers using silk-inspired Peptides" – Taylor Blatz; Dr. Amanda Murphy, faculty advisor, Western Washington University

F-7 "Synthesis of Redox Active Chitosan Derivatives For Use As Targeted Antioxidant Therapeutics" – Emily Miller; Dr. Andrew Duncan, faculty advisor, Willamette University

F-8 "Rubbing Elbows: How Surfactant Size Modifies Surface Properties" – Jake Palumbo; Dr. Kevin Johnson, faculty advisor, Pacific University

F-9 "Synthesis of hydroxypyridine ligands for homogeneous hydrogenation iron-based catalysts" – Hayley Caddes; Dr. Luc Boisvert, faculty advisor, University of Puget Sound

F-10 "Organic ligand synthesis for studies on iron-based hydrogenation catalysts" – Shelby Willis; Dr. Luc Boisvert, faculty advisor, University of Puget Sound

F-11 "Microwave-assisted Synthesis of Heavily Iodinated Boron Clusters" – Graham Matheson; Dr. Mark Juhasz, faculty advisor, Whitman College

F-12 "Structural insights of a mononuclear iron center in 2,6-dichlorohydroquinone-1,2-dioxygenase (PcpA) from in silico models" – Peter Carmichael; Dr. Dalia Rokhsana, faculty advisor, Whitman College

F-13 "7,12-dicarboxy-1-carba-closo-dodecaborane: A novel boron cluster with adjacent carboxylic acids" – Greg Dwulet; Dr. Mark Juhasz, faculty advisor, Whitman College

F-14 "MWI Iodination and Cyanation of B12H12" – Hannah Rosie Midget; Dr. Mark Juhasz, faculty advisor, Whitman College

F-15 "Synthesis and design of functional models based on the Carbon Monoxide Dehydrogenase active site" – Jacob O'Connor; Dr. Dalia Rokhsana, faculty advisor, Whitman College

F-16 "Reactions of Sucralose (Splenda) in Weakly Basic Aqueous Solutions" – Brendan Griffiths; Dr. Trisha Russel, faculty advisor, Whitworth University

F-17 "Synthesis and evaluation of Praziquantel derivatives as pharmacologic chaperones of Aryl Sulfatase B for the treatment of Mucopolysaccharidosis VI" – Chandler Mason and Daniel Prager; Dr. Trisha Russel, faculty advisor, Whitworth University

F-18 "Synthesis and Characterization of a Reversible Carceplex" – Daniel Bryant and Kyle Nogales; Dr. Dan Nogales, faculty advisor, Northwest Nazarene University

F-19 "Asymmetric boron difluorides: A search for highly tunable fluorescent dyes" – Aleksey Kozlov, Elijah Glascock, and Tara Cristallo; Dr. Daniel Chase, faculty advisor, Gonzaga University

F-20 "A complimentary tool for the visualization and analysis of molecular electronic structure" – David Rodriguez Perez; Dr. Gergely Gidofalvi, faculty advisor, Gonzaga University

ANALYTICAL INORGANIC / PHYSICAL CHEMISTRY

G-1 "Detection of calcein blue in silver modified silica sol-gels using SERS" – Evan Carlson; Dr. Elizabeth Atkinson, faculty advisor, Linfield College

G-2 "Characterization of novel organically tailed polyoxometalates" – Joseph Perryman; Dr. Elizabeth Atkinson, faculty advisor, Linfield College

G-3 "Carbon Nanofoams as Porous Scaffolds for Iron-Air Battery Electrodes" – Maximillian Mayther and Sean D. Murphy; Dr. Justin C. Lytle, faculty advisor, Pacific Lutheran University

G-4 "ROMP Synthesis of ionic polymers for fuel cell membranes" – Victoria Popovich; Dr. Dean A. Waldow, faculty advisor, Pacific Lutheran University

G-5 "Synthesis and Characterization of Functionalized Dicarboxide Oxanorbornyl Diblock Copolymers as Potential Solid Electrolytes for Lithium-Ion Batteries" – Jesus Rosales and Thomas J. Kolibaba; Dr. Dean A. Waldow, faculty advisor, Pacific Lutheran University

G-6 "Synthesis and Characterization of a Novel Ethylene Oxide Functionalized Dicarboxide Oxanorbornyl Polymer" – Douglas Smith; Dr. Dean A. Waldow, faculty advisor, Pacific Lutheran University

G-7 "Determination of the Methanol + Carbon Disulfide Liquid-Liquid Phase Diagram" – Emily Weatherford; Dr. J. Charles Williamson, faculty advisor, Willamette University

G-8 "Method development for measuring marijuana consumption in Tacoma, WA by sewage based drug epidemiology" – Heather Fryhle; Dr. Dan Burgard, faculty advisor, University of Puget Sound

G-9 "Sum frequency generation at the DMSO/air interface: Theory meets experiment" – Tyler Ueltschi; Dr. Patrick El-Khoury (Pacific Northwest National Laboratory), Dr. Hong-fei Wang (Pacific Northwest National Laboratory), and Dr. Amanda Mifflin, faculty advisors, University of Puget Sound

G-10 "Iodine as a visible light probe of the micellar environment" – John Brooksbank; Dr. Allison Calhoun, faculty advisor, Whitman College

G-11 "Influence of pH on Ligand Exchange Rate with Phosphonate-Containing Chelating Agents" – Maclean Harned; Dr. Nathan Boland, faculty advisor, Whitman College

G-12 "Analysis of Organic Matrices in Scleractinian Corals" – Lauren Vorona; Dr. Allison Calhoun, faculty advisor, Whitman College

G-13 "Influence of low molecular weight acids on rates of ligand exchange between strong chelating agents" – Andrew Wildman; Dr. Nathan Boland, faculty advisor, Whitman College

G-14 "Novel Triple-Decker Complexes: Regioselective reactions of octa, nona, decamethyl metallocenes" – Erin Fagnan and Andrew Schwartz; Dr. Eric Watson, faculty advisor, Seattle University

G-15 "Vibrational Analysis of Multifunctional Alkyl Nitrates" – John Rarick; Dr. Ryan P. McLaughlin, faculty advisor, Seattle University

G-16 "Bioarchaeology, Barbados, Eastern Caribbean: Isotopic Analyses of Teeth and Bone from Human Remains" – Tiffany Hansen; Dr. Steve Hackenberger, faculty advisor, Central Washington University

G-17 "Effect of ZnO Morphology on the Photodegradation of Malachite Green Oxalate" – Stephen Bryant and Kevin Laughlin; Dr. Jerry Harris, faculty advisor, Northwest Nazarene University

G-18 "Nanostructured Polymer Lithography for Photovoltaic Applications" – Allison Christy and Nick McKibben; Dr. Jerry Harris, faculty advisor, Northwest Nazarene University

G-19 "Affinity measurements between divalent metal ions and phospholipids by analytical affinity chromatography" – Chris Lundeen and Elizabeth MacDonald; Dr. Eric Ross, faculty advisor, Gonzaga University

ENVIRONMENTAL SCIENCE / GEOLOGY

H-1 "Modeling of the Effects of Climate on the Glaciers of Mount Rainier, Washington" – Christina Gray; Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University

H-2 "Debris Flow Deposit Characteristics on Mount Rainier, Washington" – Samantha Harrison; Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University

H-3 "Meltwater Hydrochemistry on Mount Rainier, Washington" – Emily Knutsen; Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University

H-4 "Analyzing Urban Microclimates and Atmospheric Stability in Portland, OR; Performance of New Substrates, Sedum spp., and Dudleya lanceolata on Green Roofs" – Brooke Holmes and Mike Allen; Dr. Ted Eckmann, faculty advisor, University of Portland

H-5 "Air Quality in the Treasure Valley, Idaho" – Shelby Elkins; Dr. Katie Devine, faculty advisor, College of Idaho

H-6 "Investigating the mechanism by which Bisphenol A affects sustained movement in the pond snail Helisoma trivolvis" – Skyler Tetreau; Dr. Siddharth Ramakrishnan, faculty advisor, University of Puget Sound

H-7 "Influence of metal oxide surfaces on ligand reactions between strong chelating agents" – Janni Conrad; Dr. Nathan Boland, faculty advisor, Whitman College

H-8 "Glaciation of the Goat Rocks-Naches area, Washington" – Lena Goss and Helen Sheffer; Dr. Grant Shimer and Dr. Bob Carson, faculty advisors, Whitman College

H-9 "Composition of Secondary Organic Aerosols" – Ryan Caylor; Dr. John Shilling (Pacific Northwest National Laboratory) and Dr. Matt Wise, faculty advisors, Concordia University

H-10 "Optical Properties of Secondary Organic Aerosols" – Felisha Imholt; Dr. John Shilling (Pacific Northwest National Laboratory) and Dr. Matt Wise, faculty advisors, Concordia University

H-11 "Thermodynamic Evaluation of the Role of Magma Mixing in the 1968-2010 Eruption of Arenal Volcano, Costa Rica Using the Magma Chamber Simulator" – Jenna Adams; Dr. Martin J. Streck (Portland State University), Dr. Frank J. Spera (University of California, Santa Barbara), and Dr. Wendy Bohrson, faculty advisors, Central Washington University

H-12 "Toxic Effects of Black Carbon Nanoparticles on Type II Epithelial cells" – Naomi Beebe, Hector Casique, Casey Newman, Dan Hinz, and Jeffrey Barnes; Dr. April Binder and Dr. Anne Johansen, faculty advisors, Central Washington University

H-13 "Apple Orchard Monitoring Using Aerial Multispectral Imaging" – John Lonai and Scott Thatcher; Dr. Duke Bulanon, faculty advisor, Northwest Nazarene University

MICROBIOLOGY

I-1 "Impacts of a Restoration Logging Project on Metabolic Diversity of Fresh Water Stream Microbes in Chehalem Ridge Natural Area" – Amanda Clark; Dr. Lisa Sardinia, faculty advisor, Pacific University

I-2 "Thermoregulatory and respiratory consequence of haemogragarine infection in the fence lizard Sceloporus occidentalis" – Nance Makai; Dr. David Scholnick, faculty advisor, Pacific University

I-3 "The Effect of Polyamine Depletion on Parasite Proliferation" – Dustin Paradis; Dr. Sigrid Roberts, faculty advisor, Pacific University

I-4 "Bacterial Antibiotic Resistance: An Analysis of Two Stream Drainages at the Chehalem Ridge Natural Area" – Tommy Yates; Dr. Lisa Sardinia, faculty advisor, Pacific University

I-5 "An assessment of the diversity and abundance of methane-associated microorganisms in the Columbia River Estuary" – Mina Kim and Kaela Jenkins; Dr. Gyorgyi Nyerges, faculty advisor, Pacific University

I-6 "Discovery and Genomic Analysis of a Novel Mycobacteriophage Isolated at The College of Idaho" – Shandee Tachick; Dr. Richard L. Daniels, faculty advisor, College of Idaho

I-7 "Antibacterial properties of tea: A journey across Asia, from the Tang Dynasty to modern times" – Avery Hong; Dr. Mihail Iordanov, faculty advisor, Concordia University

I-8 "The Human Monocyte Response to Methicillin Resistant Staphylococcus aureus Treated with Subinhibitory Doses of Antibiotics" – Boone Rhinehart; Dr. Jamee Nixon, faculty advisor, Northwest Nazarene University

I-9 "Role of pH in the alternative activation of macrophages" – Om Neelay; Dr. Jakob von Moltke (University of California, San Francisco) and Dr. Richard Locksley (University of California, San Francisco), faculty advisors, Gonzaga University

I-10 "Visualizing YtvA Protein Levels During Disulfide Stress in Bacillus subtilis" – Paige Nienhuis; Dr. Carla Y. Bonilla, faculty advisor, Gonzaga University

I-11 "Bacteriophage as a biocontrol agent for crown gall disease" – Rachel Noyes; Dr. Marianne Poxleitner, faculty advisor, Gonzaga University

PHYSICS / COMPUTER SCIENCE / MATH / ENGINEERING

J-1 "Does a Simple Lattice Protein Model Exhibit Self-Organized Criticality?" – Arun Bajracharya, Allissa Runyon, and Dana Gibbon; Dr. J. Murray, faculty advisor, Linfield College

J-2 "Barriers to characterizing electronic properties of solar cells" – Justin Davis; Dr. J. Heath, faculty advisor, Linfield College

J-3 "Demonstrating the fundamentals of quantum mechanics with an optical quantum eraser" – Ian Averman and Peter Schwarz; Dr. Max Schlosshauer, faculty advisor, University of Portland

J-4 "A Dynamical Model of Alanine Dipeptide" – Rebekah Hawkins; Dr. Roy Campbell, faculty advisor, Walla Walla University

J-5 "Categorization of Cusp Crossing Structures at the Magnetopause" – Summer Thresher; Dr. Karlheinz Trattner, faculty advisor, Walla Walla University

J-6 "Stabilizing Extended Cavity Lasers to Create a Magneto-Optical Trap for Rubidium and Calcium Atoms" – Jonathan Hallsted and Aran Johnson; Dr. Michaela Kleinert, faculty advisor, Willamette University

J-7 "Understanding Laser Noise in an Atomic Vapor for Magnetometry" – Aojie Zheng; Dr. Shannon O'Leary, faculty advisor, Lewis & Clark College

J-8 "Progress Towards Optical Limiting in Photonic Crystal Fibers Coated with Ag-Nanoparticles" – Jonathan Michael Park; Dr. James Butler, faculty advisor, Pacific University

J-9 "Comparison Studies of Fluorescent Lifetimes Exhibited by Quantum Dots" – Shannon Stahl; Dr. James Butler, faculty advisor, Pacific University

J-10 "Ammonia and HC7N Emission in Starless Dense Cores" – Tierra Candelaria; Dr. Kathrine Devine, faculty advisor, College of Idaho

J-11 "Shell Modelling of Turbulence" – Seth Raver; Dr. Kathrine Devine, faculty advisor, College of Idaho

J-12 "Pitch angle survey of GOODS spiral galaxies" – Ben Boe; Dr. Daniel Kennefick, faculty advisor, University of Puget Sound

J-13 "Quantum-state tomography of single-photon entangled states" – Elliot Burch; Dr. Mark Beck, faculty advisor, Whitman College

J-14 "Magnetic Hole Formation Subject to Directional Discontinuities" – Peter Jovanovich; Dr. Bob Hamilton, faculty advisor, George Fox University

J-15 "Sound velocities and validity of Birch's Law for ultra-high pressure metals and ionic solids" – Lucas Ware; Dr. David Boness, faculty advisor, Seattle University

J-16 "Calculating the primordial helium abundance" – Chauncy Cullitan and Garrett Mathews; Dr. Erik Aver, faculty advisor, Gonzaga University

J-17 "Numerical Analysis of the Hybrid Particle Filter on a Chaotic Dynamic System" – Ruvim Kondratyev; Dr. Haiyan Cheng, faculty advisor, Willamette University

J-18 "Particle Filter Optimization through Adaptive Sampling" – David Livingston; Dr. Haiyan Cheng, faculty advisor, Willamette University

J-19 "Single Bubble Sonoluminescence in a High Magnetic Field" – Jack Biewend; Dr. John Stutz, faculty advisor, Northwest Nazarene University

J-20 "Confetti Revolver: Usability Testing and Deployment of Flexible Electronics in Space" – Drew Johnson and Lukas Rieke; Dr. Dan Lawrence, faculty advisor, Northwest Nazarene University