MURDOCK
COLLEGE SCIENCE RESEARCH PROGRAM

CELEBRATING AND ENGAGING SCIENTIFIC DISCOVERIES

THE 22nd ANNUAL MCSRP CONFERENCE

SPONSORED BY THE M.J. MURDOCK CHARITABLE TRUST

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CO-HOSTED WITH LEWIS & CLARK COLLEGE

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1867

Twenty-Second Annual MCSRP Conference

"Celebrating and Engaging Scientific Discoveries"

Hilton Hotel, Vancouver, WA
Co-host: Lewis and Clark College & M.J. Murdock Charitable Trust

MURDOCK
COLLEGE SCIENCE
RESEARCH PROGRAM

Thursday, November 7, 2013

6:00 - 8:00 p.m. Social Networking Reception - Hemlock/Oak Room *(for Faculty, Administrators, and Staff)*
5:00 - 7:00 p.m. Registration Available - Heritage Pre-Function Area

Friday, November 8, 2013

6:45 - 8:00 a.m. REGISTRATION - Heritage Pre-Function
BREAKFAST - Discovery A-E

7:00 - 8:00 a.m. Working Breakfast - Cedar (for judges and MCSRP Panel members)

8:00 - 8:30 a.m. OPENING / WELCOME - Discovery Ballroom A-E
- MC - Dr. Michael Droide, Lewis & Clark College
- Dean Tuajuanda Jordan, Lewis & Clark College
- Dr. Moses Lee, M.J. Murdock Charitable Trust

8:50 - 11:50 a.m. ORAL PRESENTATIONS

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

SYMPOSIUM ON PHYSICAL SCIENCES
Discovery A/B
Presider: Dr. Tuajuanda Jordan,
Dean, Lewis & Clark College

SYMPOSIUM ON LIFE SCIENCES
Discovery C/D/E
Presider: Dr. Marlene Moore,
Dean, Willamette University

10:30 - 10:50 a.m. BREAK - Discovery Foyer East
11:50 a.m. - 1:00 p.m. LUNCH - Discovery Ballroom A-E
Noon - 1:00 p.m. LUNCHEON - Cedar *(Deans, Provosts, Faculty Members, and Grants Office Staff)*

1:00 - 5:00 p.m. CONTINUE ORAL PRESENTATIONS AND GRADUATE SCHOOL FAIR

PHYSICAL SCIENCES SYMPOSIUM ATTENDS GRADUATE SCHOOL FAIR
Hallway between Discovery and Heritage
1:00 - 2:20 p.m.

PHYSICAL SCIENCES SYMPOSIUM CONTINUES
Discovery A/B
Presider: Dr. Jim Vyvyan,
Professor and Chair, Chemistry, Western Washington University
2:20 - 5:00 p.m.

LIFE SCIENCES SYMPOSIUM CONTINUES
Discovery C/D/E
Presider: Dr. Grant Hokit,
Associate Professor of Biology, Carroll College
1:00 - 3:20 p.m.

LIFE SCIENCES SYMPOSIUM ATTENDS GRADUATE SCHOOL FAIR
Hallway between Discovery and Heritage
3:40 - 5:00 p.m.

5:00 - 6:00 p.m. FREE TIME, POSTERS SET-UP - Heritage Ballroom
6:30 - 8:30 p.m. BANQUET - Discovery A-E
Keynote Speaker: Dr. Moses Lee
From Small Molecule to Curing and Protecting Against Malaria:
Small School Doing BIG SCIENCE

Saturday, November 9, 2013

6:45 - 8:00 a.m.	BREAKFAST - Discovery A-E *Students can put up their posters if they have not done so the night before.*
8:00 - 9:45 a.m.	**Poster Session #1** (A, B, G, H, I) - Heritage Ballroom
9:45- 11:30 a.m.	**Poster Session #2** (C, D, E, F, J, K) - Heritage Ballroom
11:30 a.m. - 12:30 p.m.	TAKE DOWN POSTERS, ALL ATTENDEES COMPLETE SURVEY, LUNCH
12:30 - 1:30 p.m.	CLOSING / AWARDS - Discovery Ballroom A-E • MC - DR. Michael Broide, Lewis & Clark College • Dr. Chris Craney, Occidental College • Dr. John Van Zytveld, M.J. Murdock Charitable Trust • Dr. Peter Collings, Swarthmore College • Dr. David Van Wylen, St. Olaf College • Dr. Moses Lee, M.J. Murdock Charitable Trust • Dr. Marlene Moore, Willamette University • Dr. Tuajuanda Jordan, Lewis & Clark College

LIFE SCIENCES SYMPOSIUM

Nov 8th, Discovery C/D/E

MURDOCK COLLEGE SCIENCE RESEARCH PROGRAM

8:50 AM – 11:50 AM; Presider Dr. Marlene Moore

1. "West Nile Virus and beyond: studying infectious disease ecology in Montana"
   – *Tyler Jacobsen; Dr. Grant Hokit, faculty advisor, Carroll College*

2. "Application of Dalea ornata (Fabaceae) extractives toward inhibition of the hookworm Ancylostoma ceylanicum"
   – *Will Ray, Eric Winterstein and Kaitlin Koppinger; Dr. Gil Belofsky and Dr. Blaise Dondji, faculty advisors, Central Washington University*

3. "The effects of cadmium on type I collagen in the extracellular matrix of osteoblast-like Saos-2 cells"
   – *Dannen Wright; Dr. Sara Heggland, faculty advisor, The College of Idaho*

4. "An extra copy of COF1 suppresses an aneuploid phenotype in the yeast Saccharomyces cerevisiae"
   – *Alexandra Murphy; Dr. Kirk Anders, faculty advisor, Gonzaga University*

5. "Mapping neuronal circuitry using Brainbow zebrafish"
   – *Leah Weston and Kyla Hamling; Dr. Tamily Weissman-Unni, faculty advisor, Lewis & Clark College*

6. Examination of the folding patterns of the cortactin protein
   – *Jacob Priester; Dr. Anne Kruchten, faculty advisor, Linfield College*

7. "Does pollution provide frogs protection from the pathogenic fungus Batrachochytrium dendrobatidis?"
   – *Jessie Cossel and Jennifer Field; Dr. John Cossel Jr., faculty advisor, Northwest Nazarene University*

8. "Gene expression of human vitamin A and D receptors is upregulated in the presence of swine flu nonstructural protein"
   – *Kyle W. Hersey and Meijiao M. Jaehning; Dr. Rosalind J. Billharz, faculty advisor, Pacific Lutheran University*

1:00 PM – 3:20 PM; Presider Dr. Gary Hokit

9. "Enzymatic Tetris: a cytochrome P450 substrate docking study"
   – *Ashleigh Pilkerton; Dr. Kevin Johnson, faculty advisor, Pacific University*

10. "Turning selfish proteins into programmable genome editors"
    – *Jazmine Richter; Dr. Brett Kaiser, faculty advisor, Seattle University*

11. "Regulation of Mitotic Cytoskeleton Dynamics by Integrin-Linked Kinase in Retinoblastoma"
    – *William Sikkema; Dr. Julia Mills, faculty advisor, Trinity Western University*

12. "The impact of high-fat diet on maternal and offspring behavior"
    – *Katy Stevens and Rachel Lockard; Dr. Elinor L. Sullivan, faculty advisor, University of Portland*

13. "A stable isotope approach to understanding carbon cycling in prairie soils"
    – *Kelsey Crutchfield-Peters; Dr. Kena Fox-Dobbs and Dr. Betsy Kirkpatrick, faculty advisors, University of Puget Sound*

14. "Aerobic methanotroph proliferation patterns and rates in nascent methane seeps"
    – *Nicholas Davies; Dr. Rick Colwell (Oregon State University), faculty advisor, Whitman College*

15. "Sugar coated bacteria: An investigation of exopolysaccharide in Caulobacter crescentus"
    – *Emily Harvey; Dr. Melissa Marks, faculty advisor, Willamette University*

PHYSICAL SCIENCES ORAL PRESENTATIONS

Nov 8th, Discovery A/B

MURDOCK COLLEGE SCIENCE RESEARCH PROGRAM

8:50 AM – 11:50 AM; Presider Dr. Tuajuanda Jordan

1. "Using holographic optical tweezers to study microbubble dynamics"
   – *Amaya Lucas and Reuben Peterson; Dr. Shannon O'Leary, faculty advisor, Lewis & Clark College*

2. "Using Synchrotron X-Rays to Determine the Environmental Effects on Surface Atomic Composition of Nanoporous Palladium-Rhodium Alloys"
   – *Austin Winkelman; Dr. Patrick Cappillino, Dr. David Robinson (Sandia National Laboratories), Dr. Markus Ong, faculty advisor, Whitworth University*

3. "Synthesis of Gold-Titanium Dioxide Nanoparticles for Photocatalytic Degradation of Several Organic Materials"
   – *Benjamin Rinne; Dr. Davida Brown, faculty advisor, George Fox University*

4. "Electrochemical performance of a high surface area, iron-coated, carbon nanofoam electrode"
   – *Marshall T. McNally; Dr. Justin C. Lytle, faculty advisor, Pacific Lutheran University*

5. "Analysis of trace elements across reef-building coral genera"
   – *Nilce Alvarez and Lucas Ramadan; Dr. Allison Calhoun, faculty advisor, Whitman College*

6. "Farmer in the sky: Orchard monitoring using aerial imaging system."
   – *Mark Horton and Paulo Salvador; Dr. Duke Bulanon, faculty advisor, Northwest Nazarene University*

7. "Coupled vibrations between musical drumheads"
   – *Benjamin Boe; Dr. Rand Worland, faculty advisor, University of Puget Sound*

8. "Multimode quantum state tomography of slow light"
   – *Noah Holte and Hunter Dassonville; Dr. Andrew Dawes, faculty advisor, Pacific University*

2:20 PM – 4:40 PM; Presider Dr. James Vyvyan

9. "Optimizing the synthesis of nickel phosphide catalysts for heteroatom removal reactions"
   – *Andrea D'Aquino; Dr. Mark Bussell, faculty advisor, Western Washington University*

10. Theoretical Study of the Characteristics of Precursors to (+)
   – *JQ1 Kevin J. Romero; Dr. James Diamond and Dr. Elizabeth J. O. Atkinson, faculty advisors, Linfield College*

11. "Designing immunity: binding analysis of single-chain NKG2D constructs interacting with MICA isoforms from stressed kidney cells"
   – *Andrew Daman; Dr. Ben McFarland, faculty advisor, Seattle Pacific University*

12. "Purification and characterization of isoprene synthase from the moss Campylopus introflexus"
   – *Megan P. Newcomb, Alexandra J. Lantz, Joseph F. Cardiello; Dr. Todd. N. Rosenstiel (Portland State University), Dr. Alison J. Fisher, faculty advisor, Willamette University*

13. "The use of natural orbitals in predicting molecular properties"
   – *Evan Jahrman; Dr. Gergely Gidofalvi, faculty advisor, Gonzaga University*

14. "The effect of surface friction in quasi-two dimensional flows"
   – *Jemin Shim; Dr. Paul Fontana, faculty advisor, Seattle University*

15. "Measuring the quantumness of light"
   – *Chase Calvi and Tangereen B. Claringbold; Dr. Maximilian Schlosshauer, faculty advisor, University of Portland*

ECOLOGY / PLANTS/ BIRDS

A1 "Smoking Genes out of Tobacco Plants"
– *Alexander Klementiev; Dr. Gary Tallman, faculty advisor, Willamette University*

A2 "Comparing the accuracy of Cervus, MasterBayes, and Colony for assignment of parentage in Acorn Woodpeckers"
– *Brandon Norris and Niles Desmarais; Andrew P Krupa (University of Sheffield, U.K.), Dr. Hannah Dugdale (University of Sheffield, U.K.), and Dr. Joey Haydock, faculty advisors, Gonzaga University*

A3 "Does the biological control agent, Mecinus janthinus, respond to site scale or individual manipulation of its host plant?"
– *Bryson Newell, Ned Fischer, Erin Gogal, Jackson Jones, Braeden Van Deynze, Christine Powers, Casey Collins, and John Kunthara; Dr. Gary C. Chang, faculty advisor, Gonzaga University*

A4 "The effects of vegetation on the distribution of the Rocky Mountain wood tick, Dermacentor andersoni"
– *Carlando Pierini; Dr. Grant Hokit, faculty advisor, Carroll College*

A5 "Natural selection in hybrid zones of Balsamorhiza species in central Washington"
– *Casey D Croshaw and Mariah Whitney; Dr. Jennifer M. Dechaine, faculty advisor, Central Washington University*

A6 "The physiological effects of inbreeding, outbreeding and hybridization on tolerance to drought and nutrient stress in Mimulus"
– *Celine Valentin; Dr. Arielle Cooley, faculty advisor, Whitman College*

A7 "Do hybrids collapse? Using microsatellite genotyping to study the viability of hybrid Joshua trees"
– *Colin Stewart; Dr. Christopher Smith, faculty advisor, Willamette University*

A8 "West Nile Virus Surveillance in Western Montana"
– *Diane Harrison; Dr. Elizabeth Rutledge, faculty advisor, Salish Kootenai College – Cribal College*

A9 "Photo-mediated gravitropic response of Lazy-2 Solanum lycopericum mutant"
– *Drew Anderson; Dr. Andreas Madlung, faculty advisor, University of Puget Sound*

A10 "Abnormal spawning frequencies in Puget Sound starfish"
– *Elias Lunsford and Camillo Candido; Dr. Ryan Ferrer, faculty advisor, Seattle Pacific University*

A11 "Increased photosynthetic activity contributes to hybrid vigor in A. suecica"
– *Erik Solhaug; Dr. Andreas Madlung, faculty advisor, University of Puget Sound*

A12 "Camouflage and color change abilities of marine isopods"
– *Hannah Mittlestaedt; Dr. Kristin Hultgren, faculty advisor, Seattle University*

A13 "Comparing the expression of anthocyanin-producing genes in heat stressed and non-heat stressed Mimulus"
– *Janae Edelson; Dr. Arielle Cooley, faculty advisor, Whitman College*

A14 "Not out of the woods yet: Conservation concerns for the critically endangered tropical forest frog Lithobates vibicarius in Monteverde, Costa Rica."
– *Jenifer Ayala, Rebecca Cossel and Arwyn Roe; Dr. John Cossel, Jr., faculty advisor, Northwest Nazarene University*

A15 "Estimating black-tailed deer density on Blakely Island, Washington"
– *Jubilee Brenneman and Andrew Zeiders; Dr. Eric Long, faculty advisor, Seattle Pacific University*

A16 "Impacts of a native seed pathogen on seedling growth for native and invasive grasses from Eastern Washington"
– *Kaitlin Van Volkom; Dr. Julie Beckstead, faculty advisor, Gonzaga University*

A17 "Impact of flower organ removal on insect visitation to two rose species, Rosa canina and R. rugosa"
– *Kaitlynn Ivory; Dr. Heidi E.M. Dobson, faculty advisor, Whitman College*

A18 "Vespertine flowering in Camassia"
– *Kaliko Gadson, Natalie Amo, and Rhys Ormond; Dr. Kathryn E Theiss and Dr. Susan R Kephart, faculty advisors, Willamette University*

A19 "C-13 analysis of soil-respired CO2 reveals short-term metabolism of C4 sugar in a C3 system"
– *Kelsey Crutchfield-Peters; Dr. Kena Fox-Dobbs and Dr. Betsy Kirkpatrick, faculty advisors, University of Puget Sound*

A20 "Determination of selective foraging of yellow bellied marmots (Marmota flaviventris) via microhistological and ecological analysis"
– *Kevin Ferriter; Dr. Elizabeth Addis, faculty advisor, Gonzaga University*

A21 "Allelochemicals and invasion success in Russian olives (Elaeagnus angustifolia)"
– *Ksenia Lynch; Dr. Dan Albrecht, faculty advisor, Rocky Mountain College*

A22 "Variability in vegetation seasonality and architecture in two mixed conifer forests in northern Washington and Idaho"
– *Lauren Christensen and Tanner Scholten; Dr. Grant Casady, faculty advisor, Whitworth University*

A23 "Role of aromatic compounds in host-plant recognition by the oligolectic bee Chelostoma florisomne"
– *Madeline Hess-Maple; Dr. Heidi E.M. Dobson, faculty advisor, Whitman College*

A24 "Marine sponges as bioindicators of nitrogen pollution in Oregon estuaries"
– *Mariah Denhart, Matthew Creech, and Amy Hammerquist; Dr. Jeremy Weisz, faculty advisor, Linfield College*

A25 "Restoration in Seattle parks positively influences biodiversity"
– *Meike Lobb-Rabe; Dr. Mark Jordan, faculty advisor, Seattle University*

A26 "Investigating forest recovery after invasive plant removal in River View Natural Area"
– *Michelle Garfias and Janel Hull; Dr. Peter Kennedy (University of Minnesota) and Paulette Bierzychudek, faculty advisors, Lewis & Clark College*

A27 "Chytrid in the Caribbean: Looking for Batrachochytrium dendrobatidis in Barbados."
– *Rimar Christie; Dr. John Cossel, Jr., faculty advisor, Northwest Nazarene University*

A28 "Plague, Prairie Dogs and Ferrets on the Fort Belknap Reservation"
– *Wylynn Shambo; Professor Dan Kinsey, faculty advisor, Aaniiih Nakoda College – Tribal College*

DEVELOPMENTAL BIOLOGY / PHYSIOLOGY

B1 "Intracerebroventricular injections of arginine vasopressin in female Peromyscus californicus alter aggressive behavior"
– *Alexandrea M. Garcia, Melissa E. Rowe, Grace E. Mammarella, Megan C. Mannen and Brett A. Megrath; Dr. Janet K. Bester-Meredith, faculty advisor, Seattle Pacific University*

B2 "Striped plateau lizards (Sceloporus virgatus) do not exhibit behavioral syndromes in exploratory and anti-predator contexts"
– *Alisa Wallace; Dr. Stacey Weiss, faculty advisor, University of Puget Sound*

B3 "The role of MPZL3 in fatty acid uptake and triglyceride synthesis in liver and involvement in obesity"
– *Amber Givens, Alysia Polito, Natalie Barker and James Krantz; Dr. Traci Czyzyk, advisor, Mayo Clinic in Scottsdale AZ and Dr. Rick Ridgway, faculty advisor, Seattle Pacific University*

B4 "Biochemical markers for thermal stress in North American pikas (Ochotona princeps)"
– *Austin Nearpass; Dr. Brandon Sheafor, faculty advisor, Carroll College*

B5 "Syllable comparisons in the Red Crossbill (Loxia curvirostra) complex"
– *Benjamin R. Sonnenberg and Hannah L. Lansverk; Dr. Julie W. Smith, faculty advisor, Pacific Lutheran University*

B6 "Does pollution provide frogs protection from the pathogenic fungus Batrachochytrium dendrobatidis?"
– *Brandon Demarco, Jessie Cossel and Jennifer Field; Dr. John Cossel Jr., faculty advisor, Northwest Nazarene University*

B7 "Investigating the estrogenic effects of phytocompounds present within Gaultheria shallon extract"
– *Bruno Gegenhuber; Dr. Paige Baugher, faculty advisor, Pacific University*

B8 "Comparison of West Nile Virus prevalence in horses"
– *Caitlin Newton; Dr. Sam Alvey, faculty advisor, Carroll College*

B9 "Investigation of the frizzled-independent signaling pathway in Drosophila melanogaster pupal wings: Gliotactin, Lachesin, Coracle, Discs Large"
– *Chris Dobosz; Dr. Dennis Venema, faculty advisor, Trinity Western University*

B10 "The effect of forced desynchrony on adrenal steroid regulation in rats"
– *David Renteria; Dr. Cheryl Wotus, faculty advisor, Seattle University*

B11 "The evolution of external taste buds in fishes"
– *Erinn M. Kuest and Dakota M. Rowsey; Dr. Jacob J. D. Egge, faculty advisor, Pacific Lutheran University*

B12 "Olfactory disruptions and resident-intruder aggression in Peromyscus californicus"
– *Grace E. Mammarella, Alexandrea M. Garcia, Melissa E. Rowe and Brett A. Megrath; Dr. Janet Bester-Meredith, faculty advisor, Seattle Pacific University*

B13 "Testing the cytotype concept in black flies (Diptera: Simuliidae)"
– *Jessica Brisson; Dr. Gerald Shields, faculty advisor, Carroll College*

B14 "A Non-Invasive Doubly-Labeled Water Protocol for Use in Comparing Daily Energy Expenditure between Hummingbird Populations"
– *Joey Canepa; Dr. Donald R. Powers, faculty advisor, George Fox University*

B15 "Deciphering the mechanisms of microRNA-mediated gene silencing using Drosophila melanogaster"
– *Katherina Rees, Austin Browning, Mary Depner and Julie Sadino; Dr. Catherine Reinke, faculty advisor, Linfield College*

B16 "The effects of autotomy and regeneration on locomotion in purple shore crabs (Hemigrapsus nudus)"
– *Katie Bates and Tai White-Toney; Dr. Tara L. Maginnis, faculty advisor, University of Portland*

B17 "Maternal high-fat diet consumption programs offspring social behavior"
– *Kelly Christiansen; Dr. Elinor L. Sullivan, faculty advisor, University of Portland*

B18 "Vascular endothelial growth factor isoform effects on cortical development"
– *Kristin Person; Kayla Nelson (University of North Dakota), Dr. Jacob Cain and Dr. Diane Darland (University of North Dakota), faculty advisors, University of Great Falls*

B19 "Immune response to Escherichia coli and Coliphage T4 in Manduca sexta hemolymph"
– *Livingston Martin; Dr. Kendra Golden, faculty advisor, Whitman College*

B20 "Circadian Profile of pCREB expression in the adrenal gland"
– *Maurice Tran; Dr. Angela Katsuyama (University of Washington), faculty advisor, Seattle University*

B21 "Arginine vasopressin in the brain and its correlation with anxiety and maternal aggression in female California mice (Peromyscus californicus)"
– *Melissa E. Rowe, Grace E. Mammarella, Alexandrea M. Garcia, Haylee R. Yepson, Brett A. Megrath, Jennifer R. Gregg, Shelby Swanson and Benjamin R. Eisenreich; Dr. Janet K. Bester-Meredith, faculty advisor, Seattle Pacific University*

B22 "Investigation of the frizzled-independent signaling pathway in Drosophila melanogaster pupal wings: Gliotactin, Nervana 2, Coracle"
– *Peter Hogg and Chris Dobosz; Dr. Dennis Venema, faculty advisor, Trinity Western University*

B23 "Investigating the effects of beaver (Castor canadensis) activity on wetland areas in Eastern Washington"
– *Richard Graham-Bruno and Samantha Kennefick; Dr. Matt Bahm (Montana Tech), faculty advisor, Joe Cannon (The Lands Council), Gonzaga University*

B24 "Modeling the rhythmic activity of the respiratory neuronal network in the pre-Bötzinger Complex"
– *Sarah Debs; Dr. Lorin Milescu (University of Missouri), faculty advisor, Whitman College*

B25 "From solid to sand: how does substrate affect the biomechanics of hopping by kangaroo rats?"
– *Laura Shellooe, Mariah Eckwright and Kami Cole; Dr. Craig P. McGowan (University of Idaho), faculty advisor, Gonzaga University*

MOLECULAR AND CELL BIOLOGY

C1 "Modulation of ERK and Breast Cancer Cell Growth by Estrogen Receptors"
– *Angela Rofelty; Dr. John M. Schmitt, faculty advisor, George Fox University*

C2 "Regulation of LNCaP Respiration by Plasma Membrane and Mitochondrial Angiotensin Receptors"
– *Anna Reister; Dr. Jeffrey Duerr, faculty advisor, George Fox*

C3 "Characterization of the GLB1 cDNA from normal and GM1-gangliosidosis affected ovine fibroblast cells to confirm possible disease causing mutations"
– *Brady Dieter; Dr. Amelia J. Ahern-Rindell, faculty advisor, University of Portland*

C4 "Modifying an NtRac1-containing construct to determine whether heat interferes with auxin-regulated NtRac1 localization"
– *Brendan Dwyer; Dr. Gary Tallman, faculty advisor, Willamette University*

C5 "Assessment of galactose as a possible pharmocological chaperone for beta-galactosidase in fibroblasts from GM1-gangliosidosis affected sheep"
– *Colin Ritter; Dr. Amelia J. Ahern-Rindell, faculty advisor, University of Portland*

C6 "Laminar shear stress induces morphological and angiogenic changes in HUVECs"
– *Danielle Hyatt and Sina Y. Rabbany; Dr. Shahin Rafii (Weill Cornell Medical School), faculty advisor; Gonzaga University*

C7 "Determining amino acid propensity for propagation of the prion Sup35 in Saccharomyces cerevisiae"
– *Emily K. Davis and James D. Knox; Dr. Kyle S. MacLea, faculty advisor, Linfield College*

C8 "CaM Kinase Activation and Cancer Cell Growth are Controlled by AKAP7"
– Hannah McFarland; Dr. John M. Schmitt, faculty advisor, George Fox University

C9 "PTH inhibits ERK activation and stimulates osteoblast survival"
– Hope Kenyon, Dr. John M. Schmitt, faculty advisor, George Fox University

C10 "The Venus IN-tervention: Exploring foaming virus polymerase dimerization using a bimolecular fluorescence assay"
– Jacqueline Wallis, Dana Emerson and Cooper Hayes; Dr. Carolyn Stenbak, faculty advisor, Seattle University

C11 "TRP-ing up GL261 cells into apoptosis"
– John French; Dr. Luke Daniels, faculty advisor, The College of Idaho

C12 "Investigation of calcitonin gene related peptide in brainstem neurons involved in pain modulation"
– Kaley Adams; Dr. Amber Buhler, faculty advisor, Pacific University, School of Pharmacy

C13 "Evolution of receptor-isoform signaling specificity in the activin signaling pathway"
– Kayla Baisch and Nathan Elmore; Dr. Andrew Wildenberg and Dr. Philip A. Jensen, faculty advisors, Rocky Mountain College

C14 "Gene expression of human vitamin A and D receptors is upregulated in the presence of swine flu nonstructural protein"
– Kyle W. Hersey and Meijiao M. Jaehning; Dr. Rosalind J. Billharz, faculty advisor, Pacific Lutheran University

C15 "Sequence analysis of exons 2, 13, and 14 of the PPBG gene from normal and GM1-gangliosidosis affected sheep"
– Kylie Leffler; Dr. Amelia J. Ahern-Rindell, faculty advisor, University of Portland

C16 "A survey for Cache Valley Virus in Eastern Montana using RT PCR and ELISA"
– Madeline Woodruff; Dr. Sam Alvey, faculty advisor, Carroll College

C17 "Analysis of the morphology of Ewing's Sarcoma cells"
– Mary Depner and Daniel Namazi; Dr. Anne Kruchten, faculty advisor, Linfield College

C18 "CaM Kinase I Binds and Regulates p53 in Breast Cancer Cells"
– Renee Geck; Dr. John M. Schmitt, faculty advisor, George Fox University

C19 "CYP 3A4 letrozole metabolism activation by ketoconazole"
– Stephen Black; Dr. John Harrelson, faculty advisor, Pacific University, School of Pharmacy

NEUROSCIENCE / PSYCHOLOGY / EXERCISE SCIENCE

D1 "Are serotonin neurons involved in the depression observed in Huntington's disease? Effects of human mutant huntingtin expression in the dorsal raphe of wildtype mice"
– Anna Warden, Jordan Lueras and Sydney Weber; Dr. Mark Pitzer, faculty advisor, University of Portland

D2 "The humor gender gap: how gender and humor interact to influence social behavior"
– Carmen M. Hové and Janelle M. Wagnild; Dr. Cara M. Wall-Scheffler, faculty advisor, Seattle Pacific University

D3 "Aging's effect on alpha and beta waves during rest and cognitive tasks."
– Jared Morgan; Dr. Glena Andrews, faculty advisor, Northwest Nazarene University

D4 "Rapid stepping tests challenging medial-lateral and anterior-posterior control as an assessment of performance in older adults"
– *Margaret Ruwitch and Theo Kataras; Dr. Brandi Row Lazzarini, faculty advisor, Willamette University*

D5 "Puzzling Paradox of Practice Impairing Play for Preschoolers"
– *Marjorie Pichon, Steven Lucas, Desiree Etzel, and Malik Farrakhan; Dr. Erik Nilsen, faculty advisor, Lewis & Clark College*

D6 "Shoe degradation over 400 miles in masters runners"
– *Matt Thompson; Dr. Heidi Orloff, faculty advisor, University of Puget Sound*

D7 "Investigations of response inhibition and risky behaviors in young adults and preschool-aged children"
– *Melissa Newton-Mora, Juliana Pirkle, and Kyra Ortega-Schwartz; Dr. Todd D. Watson, faculty advisor, Lewis & Clark College*

D8 "Mapping of the neural circuitry associated with paw withdrawal learning in spinal mice"
– *Sophia Raefsky; Dr. Jung Kim, faculty advisor, University of Puget Sound*

BIOCHEMISTRY

E1 "The purification and characterization of RquA"
– *Adam Blount; Dr. Jennifer Shepherd, faculty advisor, Gonzaga University*

E2 "Purification and characterization of a Bdellovibrio derived α-glucosidase, malA"
– *Adrian Simpson; Dr. John Hanson, faculty advisor, University of Puget Sound*

E3 "Making a LYST, checking it thrice: identifying the CHS/LYST homolog in C. elegans, and evaluating of GLO-1::GFP location in gut granule loss mutants"
– *Alec Barrett; Dr. Greg Hermann, faculty advisor, Lewis & Clark College*

E4 "Specificity of trans-cinnamic aldehyde for cytochrome P450 2A6"
– *Allyson Higa; Dr. John Harrelson (School of Pharmacy) and Dr. Jeannine Chan, faculty advisors, Pacific University*

E5 "Investigation of putative GATase genes for the rhodoquinone biosynthesis pathway of R. rubrum via gene knockouts"
– *Alysha Labrum; Dr. Jennifer Shepherd, faculty advisor, Gonzaga University*

E6 "Computational design and synthesis of Mo-Cu model complexes based on carbon monoxide dehydrogenase"
– *Dan Ellis; Dr. Dalia Rokhsana, faculty advisor, Whitman College*

E7 "Purification of ARVs for nanoparticle fabrication for HIV inhibition"
– *Danielle Bright; Dr. Ian Suydam, Dr. Kim Woodrow (University of Washington) and Dr. Yonghou Jiang (University of Washington), faculty advisors, Seattle University*

E8 "Using computational molecular docking methods to further understand the structure and function of the MalA protein through binding of different sugars"
– *Dinah Draluk; Dr. Jeff Grinstead, faculty advisor, University of Puget Sound*

E9 "Characterization of potato taste defect in Rwandan green beans"
– *Eric Marshall; Dr. Sue Jackels, faculty advisor, Seattle University*

E10 "The role of the retromutagenesis pathway in the acquisition of drug resistance in Saccharomyces cerevisiae"
– Gavin C. Nixon and Gracie M. Wilson; Dr. Tina M. Saxowsky, faculty advisor, Pacific Lutheran University

E11 "Retromutagenesis of Saccharomyces cerevisiae, or how I learned to love adaptive mutagenesis in yeast"
– Gracie M. Wilson and Gavin C. Nixon; Dr. Tina M. Saxowsky, faculty advisor, Pacific Lutheran University

E12 "Identification of genes involved in rhodoquinone biosynthesis in C. elegans using RNAi knockdowns"
– Helen Xun and Kelsey Guerins; Dr. Jennifer Shepherd, faculty advisor, Gonzaga University

E13 "Examination of the substrate specificity of the enzyme PcpA using synthetic model complexes"
– Jeremy Schofield; Dr. Timothy Machonkin, faculty advisor, Whitman College

E14 "Structural characterization of a silencing suppressor protein with hydrogen-deuterium exchange mass spectrometry"
– Jesse Wilson; Dr. Jeffrey Vargason, faculty advisor, George Fox University

E15 "Macrocyclic inhibitors of the 20S proteasome"
– Julia Wu and David Wilson; Dr. Marion Gotz, faculty advisor, Whitman College

E16 "Isolation and identification of novel phytoestrogenic compounds in Gaultheria shallon"
– Levi Peterson; Dr. Paige Baugher, faculty advisor, Pacific University

E17 "The inhibition of human deoxycytidine kinase mutants with deoxycytidine triphosphate & ATP"
– Loriann Reese; Dr. Michael Godsey, faculty advisor, Concordia University- Portland

E18 "An exploration of the biomedical properties of graphitic carbon nitride"
– Necia Hunter; Dr. John Thurston, faculty advisor, The College of Idaho

E19 "Binding interactions of NAMI-A with tRNAPhe"
– Rebecca Josephson; Dr. Sarah Kirk and Dr. Karen Holman, faculty advisors, Willamette University

E20 "Structure and calcium sensitivity of the C-terminus of supervillin"
– Sean Beseler; Dr. Serge Smirnov, faculty advisor, Western Washington University

E21 "Initial data collection of silencing suppressor protein, p14, by HD exchange"
– Sierra Donahue; Dr. Jeffrey Vargason, George Fox University

E22 "Computational approach to develop a validated active site model for carbon monoxide dehydrogenase"
– Tao Large and Morgan Dienst; Dr. Dalia Rokhsana, faculty advisor, Whitman College

E23 "Fluorescent monitoring of RNA assembly and processing using split spinach aptamer
- Tucker Rogers and Grant Andrews; Dr. Wade Grabow, faculty advisor, Seattle Pacific University

ORGANIC / COMPUTATIONAL CHEMISTRY

F1 "Customizable thermal decomposition via the hetero-retro-Diels-Alder reaction"
– Alex W. Wisbeck, Marisa R. Cuffin, Joy C. Murphy, and Thomas J. Kolibaba; Dr. Neal A. Yakelis, faculty advisor, Pacific Lutheran University

F2 "Structural and functional studies of desferrioxamine D"
– Alexandra Manning; Dr. Katherine Hoffmann, faculty advisor, Gonzaga University

F3 "Functionalized benzofulvene synthesis and possible application towards cancer treatment"
– Austin S. Erler, Valerie A. Lesniak, and Gregg C. Lowery; Dr. Adam C. Glass, faculty advisor, Pacific Lutheran University

F4 "The synthesis and reactivity of pyridine substituted cobaloximes"
– Blair K. Troudt; Dr. Eric E. Finney, faculty advisor, Pacific Lutheran University

F5 "Design and synthesis of dihexa analogs for treatment of alzheimer's disease"
– Brad Hopp, Audre Hyatt, John Koberstein and Danielle Selleck; Dr. Michael Sardina, faculty advisor, Whitworth University

F6 "Solvothermal synthesis and characterization of metal organic frameworks"
– Danique Gigger; Dr. Jo Crane, faculty advisor, University of Puget Sound

F7 "Exploration of the structural and energetic landscape of glycol nucleic acids"
– Emily Sleeman; Dr. Andrew Johnson, faculty advisor, Concordia University- Portland

F8 "Synthesis towards straight chain borinic acids as potential HIV-1 protease inhibitors"
– Erik Contreras; Dr. Levente Fabry-Asztalos, faculty advisor, Central Washington University

F9 "The synthesis and reactivity of novel bimetallic triple-layer complexes"
– Erin Fagnan and Alex Watson; Dr. Eric Watson, S.J., faculty advisor, Seattle University

F10 "Microwave-promoted iodination of borane and carborane clusters"
– Graham Matheson, Paul Chang and Aaron Rosenbaum; Dr. Marcus Juhasz, faculty advisor, Whitman College

F11 "Microwave-assisted synthesis and derivitization of cyanated CB11 carboranes"
– Gregory Dwulet, Hannah Midget and Aaron Rosenbaum; Dr. Marcus Juhasz, faculty advisor, Whitman College

F12 "Azobenzene functionalized DNA for light-induced DNA strigency"
– Hannah Zeitler; Dr. David S. Ginger (University of Washington), faculty advisor, Whitworth University

F13 "CASSCF Computational investigations of the [3,3] sigmatropic rearrangement of allyl esters: Are they pericyclic of psudopericyclic"
– Henry Kreiman and Mackenzie Batali; Dr. James Duncan, faculty advisor, Lewis & Clark College

F14 "Synthesis of bipyridine derived-iron catalysts for hydrogenation"
– Jack Elder; Dr. Luc Boisvert, faculty advisor, University of Puget Sound

F15 "Microalgal biodiesel from Isochrysis sp."
– John Williams, Noah Burlow, and Garrett Gilbert; Dr. Gregory O'Neil, faculty advisor, Western Washington University

F16 "Reliable path to unsaturated acids and diastereomeric pseudoacid synthesis"
– Katie Schloesser; Dr. Edward J. Valente, faculty advisor, University of Portland

F17 "Theoretical Study of the Characteristics of Precursors to (+)-JQ1"
– Kevin J. Romero; Dr. James Diamond and Dr. Elizabeth J. O. Atkinson, faculty advisors, Linfield College

F18 "Three methods to synthesize a reversible carceplex."
– Kyle Nogales, Jocelyn Benton and Daniel Bryant; Dr. Dan Nogales, faculty advisor, Northwest Nazarene University

F19 "Functional and structural characterization of PvsB"
– Mackenzie Bredereck; Dr. Katherine Hoffmann, faculty advisor, Gonzaga University

F20 "Synthesis and analysis of halogenated oxazole based liquid crystals"
– Mary Packard; Dr. Eric Scharrer, faculty advisor, University of Puget Sound

F21 "Synthesis of a Thiol-Terminated Fluorophore for Probing the Behavior of Silver Nanoparticles"
– Micah Donor; Dr. R. Carlisle Chambers, faculty adviser, George Fox University

F22 "Studies toward synthesis of new NIR curcumin derivative dyes"
– Olin Blackmore and Matthew Ishihara; Dr. Roxana Ciochina, faculty advisor, Pacific University

F23 "The use of molecular dynamics to predict the stability of squaraine rotaxanes"
– Ruth Nelson; Dr. Andrew Johnson, faculty advisor, Concordia University- Portland

F24 "Progress towards the total synthesis of Tubingensin A"
– Steven Loskot, Amanda Silberstein, Adam Goetz and Michael Corsello; Dr. Neil Garg (UCLA), faculty advisor, Seattle University

F25 "Synthesis of praziquantel derivatives as potential chaperone therapy agents for Maroteaux-Lamy syndrome"
– Victoria DePalma and Shannon James-Kozlovich; Dr. Trisha Russell, faculty advisor, Whitworth University

ANALYTICAL / PHYSICAL CHEMISTRY

G1 "2,6-Dimesitylphenylphosphinate as a platform for bimetallic complexes"
– Amanda N. Graveson, Celia M. Gendron-Herndon and Matthew D. Baer; Dr. Edward Valente, Eugenijus Urnezius, faculty advisors, University of Portland

G2 "Hydrogen gas v. sodium borohydride: comparing selectivity for the palladium-catalyzed reduction of unsaturated ketones"
– Amy Mayhugh and Anthony Mull; Dr. David Cordes, faculty advisor, Pacific University

G3 "Fluorescence of pH sensitive rhenium complexes"
– Ashton Beck; Dr. Kerry Breno, faculty advisor, Whitworth University

G4 "Trouble-shooting an affinity column for microtubule-binding compounds"
– Corinne Hester; Dr. Angela Hoffman, faculty advisor, University of Portland

G5 "Forensic analysis of biodiesel"
– Elizabeth A. Kaley; Dr. Eric E. Finney, faculty advisor, Pacific Lutheran University

G6 "Development of a surface-enhance Raman spectroscopy (SERS) based biosensor containing DAPI using silica sol-gels and aerogels"
– Evan R Carlson; Dr. Elizabeth J. O. Atkinson and Dr. Brian D. Gilbert, faculty advisors, Linfield College

G7 "The use of natural orbitals in predicting molecular properties"
– Evan Jahrman; Dr. Gergely Gidofalvi, faculty advisor, Gonzaga University

G8 "Utilization of the Hydridophosphorane HP(OC6H4NMe)2 as a Ligand in Ni(II) and Pt(II) Complexes"
– Fraser Parlane; Dr. Craig Montgomery, faculty advisor, Trinity Western University

G9 "Investigating potential non-adiabatic events in high energy ring expansions"
– Ismael A. Rodríguez Pérez, Kyle S. Stumetz and Jason T. Nadeau; Dr. Matthew E. Cremeens, faculty advisor, Gonzaga University

G10 "Surface chemistry of gold nanoparticles in natural environments"
– Keira L. Roberts; Dr. Anne K Bentley, faculty advisor, Lewis & Clark College

G11 "Improving electrochemically deposited manganese oxide thin film pseudocapacitance and long term cycling stability"
– Luciano M Santino; Dr. Anne K Bentley, faculty advisor, Lewis & Clark College

G12 "Photocatalytic degradation of methyl orange by Au/TiO2 nanoparticles with various irradiation conditions"
– Luke Rines; Dr. Davida Brown, faculty adviser, George Fox University

G13 "Gold nanoparticle modified carbon paste electrodes in potentiodynamic analysis using ferrocene"
– Malley Nason; Dr.Elizabeth J.O. Atkinson, faculty advisor, Linfield College

G14 "Application of novel diblock copolymers exhibiting nanostructure to lithium ion battery electrolyte supports"
– Marisa L. Adams; Dr. Dean A. Waldow, faculty advisor, Pacific Lutheran University

G15 "Carbon nanofoams as porous scaffolds for iron-air battery electrodes"
– Marshall T. McNally, M. Reed Pueringer, Hannah C. Seal, and Mark C. Walsworth; Dr. Justin C. Lytle, faculty advisor, Pacific Lutheran University

G16 "Quantum computational studies of molecular nonlinear optical absorption in indium phthalocyanines"
– Megan Harris; Dr. Jeremy Hatch and Dr. Kevin Johnson, faculty advisors, Pacific University

G17 "Characterizing material properties of silk-based polypyrrole electromechanical actuators"
– Nathan Bradshaw, Jesse Larson, and Sandra Roberts; Dr. Amanda Murphy and Dr. Janelle Leger, faculty advisors, Western Washington University

G18 "Nano-structured polymer lithography for photovoltaic applications."
– Nick McKibben; Dr. Jerry Harris, faculty advisor, Northwest Nazarene University

G19 "Investigating the electrophilicity of Cu-bound nitriles toward a method for [2+2+2] cyclizations"
– Nicole Broden; Dr. Colin Thomas, faculty advisor, Carroll College

G20 "Surface-Enhanced Raman based photon correlation spectroscopy"
– Noah Schorr, Nicole Koeppen, and Adam Jansons; Dr. Steven Emory, faculty advisor, Western Washington University

G21 "Reactivity of selected copper(II) complexes towards 2,5-bis(phosphoryl)-3,6-difluoro-1,4-hydroquinones"
– Paul D. Entzminger; Dr. Edward J. Valente, Dr. Eugenijus Urnezius, faculty advisors, University of Portland

G22 "Continuing work on Hubble Space Telescope Battery Cell Analysis"
– Ryan Bourgaize; Dr. Rick V. Whiteley, faculty advisor, Pacific University

G23 "Xenon-129 NMR of aqueous micelle solutions"
– Tristan Endreo, Satchel Grant and Julianna Wetmore; Dr. Allison Calhoun, faculty advisor, Whitman College

ENVIRONMENTAL SCIENCE / GEOLOGY

H1 "Coastal uplift and associated mortality of intertidal organisms from a 7.6 mw earthquake, Nicoya Peninsula, Costa Rica"
– Claire Martini; Dr. Jeff Marshall (Cal Poly Pomona), faculty advisor; Dr. Kevin Pogue, faculty advisor, Whitman College

H2 "Analyzing divergence from river continuum concept expectations in an agriculturally dominated northeastern coastal zone stream"
– *David Kemp; Dr. Edgar Franck and Dr. Alan Christian (University of Massachusetts), faculty advisors, University of Great Falls*

H3 "Radiocarbon dating of calcined bone: Pacific Porthwest"
– *James Brown; Dr. Steve Hackenberhger, faculty advisor, Central Washington Univeristy; Dr. James Chatters, Applied Paleoscience*

H4 "Bioindicators of Missouri river watershed health"
– *Joshua Buford; Dr. Katie Hoffman and Dr. Diane Lund, faculty advisors, University of Great Falls*

H5 "Method development for wastewater epidemiology"
– *Kathryn Ginsberg; Dr. Dan Burgard, faculty advisor, University of Puget Sound*

H6 "Habitat preference and breeding success of the american kestrel"
– *Kelsey Brown; Dr. Rich Van Burskirk, faculty advisor, Pacific University*

H7 "Taphonomy of mammal bones from a 7,000 year old rockshelter in Hell's Canyon, Idaho"
– *Lianne Day; Dr. Patrick Lubinski, faculty advisor, Central Washington University*

H8 "The role of soil nutrients and moisture in determining the success of prairie restoration at Zena"
– *Madeline McClelland and Anna Freitas; Dr. Briana Lindh and Dr. Karen Arabas, faculty advisors, Willamette University*

H9 "Understanding factors of ecosystem development in the pro-glacial areas of Mount Rainier"
– *Reed C. Gunstone; Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University*

H10 "The effects of rapid glacial retreat on the proglacial area: mapping geomorphological landforms on Mount Rainier, Washington"
– *Riley K. Swanson; Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University*

H11 "Properties of Water and their Effects on Decomposition"
– *Samantha Jones; Dr. Nate Bickford, faculty advisor, University of Great Falls*

H12 "Suspended sediment concentrations and erosion rates on Mount Rainier, Washington"
– *Taylor M. Christensen; Dr. Claire E. Todd, faculty advisor, Pacific Lutheran University*

PHYSICS

I1 "Crystal growth in supercooled liquids"
– *Anthonee Georgette; Dr. Stephen C. Hall, faculty advisor, Pacific University*

I2 "Noise spectroscopy of quantum interference phenomena"
– *Aojie Zheng and Alaina Green; Dr. Shannon O'Leary, faculty advisor, Lewis & Clark College*

I3 "Does a simple lattice protein folding model exhibit self-organized criticality?"
– *Arun Bajracharya, Tyler Schiewe, Yura Sim; Dr. Joelle Murray, faculty advisor, Linfield College*

I4 "Experimental & numerical analysis of coupling between musical drumheads"
– *Benjamin Boe; Dr. Rand Worland, faculty advisor, University of Puget Sound*

I5 "Electrophysiological dynamics of auditory-visual sensory substitution"
– Christian Graulty; faculty advisor Enriqueta Canseco-Gonzalez, Reed College

I6 "Exploring entanglement with the help of quantum state measurement"
– Ethan Dederick; Dr. Mark Beck, faculty advisor, Whitman College

I7 "Building blocks of the Milky Way: photometric analysis of the WLM Dwarf Galaxy"
– Garrett Budnik; Dr. Joanne Hughes Clark, faculty advisor, Seattle University

I8 "Investigating the force-dependent activity of Acanthamoeba myosin 1c function"
– Jay Howard; Dr. David Altman, faculty advisor, Willamette University

I9 "Role of contacts in capacitance measurements of solar cells"
– Justin Davis, James Harger and Addison Wisthoff; Dr. Jennifer Heath, faculty advisor, Linfield College

I10 "The role of density fluctuations in nonlinear Alfven wave damping"
– Matthew Woertink; Dr. Robert Hamilton, faculty adviser, George Fox University

I11 "Dawn of our universe: reheating and resonance in the very early universe"
– Michelle Y. Zhai; Dr. Bret J. Underwood, faculty advisor, Pacific Lutheran University

I12 "Quantized conductance by electrochemical growth of Ag nanowires"
– Sam Tuppan; Dr. Woo-Joong Kim, faculty advisor, Seattle University

I13 "Computational studies of photonic crystal fibers filled with silicon naphthalocyanine solutions"
– Seth Siddle-Mitchell and Michael Park; Dr. James Butler, faculty advisor, Pacific University

I14 "A determination of the primordial helium abundance"
– Stewart Spencer and David Rodriguez Perez; Dr. Erik Aver, faculty advisor, Gonzaga University

I15 "Quantum state tomography"
– Walker Larson; Dr. Mark Beck, faculty advisor, Whitman College

I16 "Self-organized criticality in protein folding simulations with AMBER parameters"
– Yura Sim; Dr. Joelle Murray, faculty advisor, Linfield College

COMP SCIENCE / MATH / ENGINEERING

J1 "Finitely presented groups for the undergraduate algebra student"
– Davis Shurbert; Dr. Rob Beezer, faculty advisor, University of Puget Sound

J2 "Durability of flexible electronic assemblies in extreme cryogenic ultra-high vacuum."
– Drew Johnson, Ben Gordon, David Vinson and Ryan Lofthouse; Dr. Dan Lawrence, faculty advisor, Northwest Nazarene University

J3 "Snow leopard identification using digital image processing"
– Erica Flores and Sara Beery; Dr. Agnieszka Miguel, faculty advisor, Seattle University

J4 "Low cost universal testing device for measurement of spring coefficients in energy storage and return (ESR) prosthetic feet"
– Kathryn Yancey; Dr. Adam Arabian, faculty advisor, Seattle Pacific University

J5 "Hybrid particle filter data assimilation technique"
– Kendra A. Schmal; Dr. Haiyan Cheng, faculty advisor, Willamette University

J6 "Monitoring of apple orchard using multispectral imaging."
– Mark Horton, Paulo Salvador and Kyle Lambert; Dr. Duke Bulanon, faculty advisor, Northwest Nazarene University

J7 "Tree detection using the concepts of computer vision and machine learning."
– Matthew J. Sichenze; Dr. Barry Myers, faculty advisor, Northwest Nazarene University

J8 "The Proportion of Abundant Numbers"
– Melissa Pidde; Dr. Dominic Klyve, faculty advisor, Central Washington University

J9 "Identifying numerical oscillations in linear parabolic partial differential equations"
– Mitchell Main; Dr. Corban Harwood, faculty advisor; George Fox University

J10 "Statistical modeling of the safety and impact of electric vehicles on electric power systems"
– Nicole Ng; Dr. Henry Louie, faculty advisor, Seattle University

MICROBIOLOGY

K1 "An extra copy of COF1 suppresses an aneuploid phenotype in the yeast Saccharomyces cerevisiae"
– Alexandra Murphy; Dr. Kirk Anders, faculty advisor, Gonzaga University

K2 "The effects of Hx-starvation on growth rates in cultured Plasmodium falciparum"
– Anastasia Goldys; Dr. Heather Ayala, faculty advisor, George Fox University

K3 "Development of microsatellite markers for the threatened whitebark pine (Pinus albicaulis)
– Camille Scelfo-Dalbey, Evan Tracy, Dylan Bartholomew, and Kylie Nomi; Dr. John Syring, faculty advisor, Linfield College

K4 "Antimicrobial activity of CuO/b-Bi2O3 composite nanoparticles"
– Cavan Gerrish; Dr. John Thurston, faculty advisor, The College of Idaho

K5 "Playing with Caulobacter mucus: Determining the Genetic Basis of Bacteriophage resistance"
– Christina Johnson; Dr. Melissa Marks, faculty advisor, Willamette University

K6 "Microbial community function in prairie soils changes due to sugar addition"
– David Ho; Dr. Betsy Kirkpatrick, faculty advisor, University of Puget Sound

K7 "Investigating the diversity of methane associated microbial communities in the Lateral Bays of the Columbia River Estuary by targeting metabolic genes (pmoA and mcrA)."
– Devin Fachko and Mina Kim; Dr. Gyorgyi Nyerges, faculty advisor, Pacific University

K8 "Biomass growth and lipid extraction of Nannochloropsis oculata under natural and artificial light in the Pacific Northwest"
– E. Lee Brewer and Brandon Vance; Dr. Aaron Coby, faculty advisor, Saint Martin's University

K9 "The trade-off between fighting and waving behavior in fiddler crabs of the genus Uca"
– Erik Kunz; Dr. Brook Swanson, faculty advisor, Gonzaga University

K10 "Agrobacterium mediated genetic modification of Rosa hybrida and Solanum tuberosum to confer aphid resistance"
– Erin Lapsansky and Jack Chase; Dr. Marianne Poxleitner, faculty advisor, Gonzaga University

K11 "Pressure adaptation in the hadal zone: potential piezolytes (pressure counteractants) increase with depth in tissues of marine amphipods from the intertidal to the Mariana Trench"
– Gemma Wallace; Dr. Alan Jamieson (University of Aberdeen); Dr. Douglas Bartlett (Scripps Institution of Oceanography); James Cameron (DEEPSEA CHALLENGE Project); Dr. Marion Gotz, faculty advisor; Dr. Paul Yancey, faculty advisor, Whitman College

K12 "Antimicrobial activity of tea and Kombucha"
– Hibery Ho and Maria Polozova; Dr. Mihail Iordanov, faculty advisor, Concordia University – Portland

K13 "Microbial ecology of black and green tea Kombucha"
– Maria Polozova and Hibery Ho; Dr. Mihail Iordanov, faculty advisor, Concordia University – Portland

K14 "Dopamine localization by immunofluorescence and immunoelectron microscopy in the marine macroalga, Ulvaria obscura"
– Ilya Frid, Leena Adamian, Amber Givens and Dr. Tim Nelson; Dr. Rick Ridgway, faculty advisor, Seattle Pacific University

K15 "The effects of protein characteristics on the mechanical properties of spider silk"
– James Matern; Dr. Brook Swanson, faculty advisor, Gonzaga University

K16 "Relative utility of different lengths of the mitochondrial 16S rDNA gene in the population genetics of Dermacentor andersoni"
– Kaya Garringer; Dr. Jennifer Geiger, faculty advisor, Carroll College

K17 "Parasites in Peromyscus"
– Madelyn Voelker; Dr. Laurie J. Dizney, faculty advisor, University of Portland

K18 "Antibiotic resistance and mobile genetic elements in beef cattle manure and exposed soils
– Mattie Huffman and Eric Layton; Dr. Gyorgyi Nyerges, faculty advisor, Pacific University

K19 "Determining Coliform and E. coli levels in Pryor Creek"
– Melinda Obritschkewitsch, Jordyn Eastlick, and Shelby Burton; Dr. Cristi Hunnes, faculty advisor, Rocky Mountain College

K20 "A screen of Bacillus subtilis genes for their role in biofilm involvement"
– Nina Montoya; Dr. Carla Y. Bonilla, faculty advisor, Gonzaga University

K21 "Sub-inhibitory antibiotic treatment of MRSA alters the cytokine response of human monocytes."
– Ryan Harding; Dr. Jamee Nixon, faculty advisor, Northwest Nazarene University

K22 "Seeing chromosomes with a computer: use of microarray-based comparative genomic hybridization to determine chromosome number in aneuploid yeast cells"
– Theresa Nguyen; Dr. Kirk Anders, faculty advisor, Gonzaga University

K23 "Genome wide search for type III secretion system effectors of Edwardsiella tarda using bioinformatics"
– Vanessa Porter; Dr. Ka Yin Leung, faculty advisor, Trinity Western University