14th Annual
College of Science
Student Research Day

Undergraduate and graduate students working with College of Science faculty on original research projects will present their work in an all-College poster session. The student researchers and faculty will be available to answer questions. Come and see the wide range of student research from the College of Science!

Duncan Hall
Ground Level
10:00 am - 1:00 pm
Friday, April 27, 2018

This event is wheelchair accessible. For additional accommodations, contact Dr. Roy Okuda (408) 924-2525 by April 20, 2018
SPECIAL POSTER
College of Science students matriculating to Graduate or Professional Schools in Spring 2018 and students working in off-site programs during Summer 2018.

RESEARCH POSTERS
Presenting students are underlined.

Department of Biological Sciences

1. Identification and Characterization of Genes Involved in Lanthanide Acquisition and Transport in Methylobacterium extorquens.
   Aeowynn Coakley, Gabriel Subuyuj
   Faculty: Elizabeth Skovran
   Collaborators: Paula Roszczenko, Norma Martinez-Gomez, Michigan State University

2. A Mutation in the MxbD Sensor Kinase Eliminates the Need for XoxF in Regulating Methanol Dehydrogenase Expression in Methylobacterium extorquens.
   Bang Luong
   Faculty: Elizabeth Skovran

3. Species Delimitation and Patterns of Infraspecific Variation in the Moss Anacolia menziesii.
   Allan Chao, Yvonne Ngo, Fran Lee, Douglas Wong
   Faculty: Benjamin Carter

4. Determining Synergistic Effects Between Doxorubicin or Paclitaxel with a Walnut Extract in Human Breast Cancer Cells.
   Gurbhej Khalsa
   Faculty: J. Brandon White

   Maria Luisa Ponce de Leon Cerqueda, Lauren S. Cunningham, Anna O. Thomasdotter, Kristin M. Gong, Nakul Patel
   Faculty: Luke P. Miller

6. Learning and Memory in a Fly Model of Fetal Alcohol Syndrome.
   Jack Cox
   Faculty: Rachael French
7. **Signaling by the Reward Hormone Neuropeptide F Regulates Feeding and Survival in Flies Reared in Ethanol.**
   Brianna Urbina, Amanda Guevara, Hillary Gates
   Faculty: Rachael French

8. **Histamine Regulates Courtship Initiation in Drosophila melanogaster.**
   Cac Tran, Jaspal Sandhu, Emily Mu
   Faculty: Rachael French

9. **Rise in Invariant Natural Killer T-17 Cells During Bordetella pertussis Infection in Mice.**
   Daniel Santos, Alana Nguyen, Khoa Bui, Damien Lo, Paul Vuong
   Faculty: Tzvia Abramson

10. **Effect of Glutamate Released from Synaptic-like Vesicles on Muscle Spindle Afferent Receptor Ending Sensitivity to Muscle Stretch in Adult Mice.**
    Arthur Harnisch, Cebrina Bustos, Camila Villarino, Sameer Masri
    Faculty: Katherine Wilkinson

11. **Effects of Obesity on Gait and Balance in Mice.**
    Sarah Chu, Sam Hui, Natanya Villegas
    Faculty: Katherine Wilkinson

12. **Effects of Diet-Induced Obesity on Spinal Reflex Excitability.**
    Gerard Nguyen, Mulatwa Haile, Jenny Nguyen, Puneet Sanghera
    Faculty: Katherine Wilkinson

13. **Sensory Activity is Required for Synaptic Integrity in C. elegans.**
    Kristine Andersen, Benjamin Barsi-Rhyne, Angelina Tang, Nebat Ali, Fatima Farah, Kristine Miller, Alan Tran, Jacqueline Pyle, Bryan Tsujimoto, Alex Duong, Joy Li
    Faculty: Miri VanHoven
    Collaborators: Noelle L’Etoile, UCSF and Martina Bremer, SJSU Dept of Mathematics and Statistics

14. **Elucidation of the Molecular Mechanisms That Underlie Neural Circuit Formation.**
    Faculty: Miri VanHoven
    Collaborators: Martina Bremer, SJSU Dept of Mathematics and Statistics

15. **Roles for Intracellular pH in Regulating Tissue Growth.**
    Ismahan Chire, Jobelle Peralta, Blake DuPriest, Harnoovirk
    Faculty: Bree Grillo-Hill

16. **Identifying and Characterizing pH-Sensitive Proteins.**
    Hillary Gates, Andin Jospovic, Hussein Abed, Delena Hoang, Lyzett Lavenant, Daniel Orozco
    Faculty: Bree Grillo-Hill

17. **Enhanced Invasive Cell Migration with Increased Intracellular pH.**
    Vivian Bui, Martey Haw, Myia Wilkes
    Faculty: Bree Grillo-Hill
18. **High Fat Diet Effects on C57 Mice Ovarian Follicle Count Ratios.**  
Bianca Opara, Dania Abid  
Faculty: Shelley Cargill  
Collaborators: Katherine Wilkinson, SJSU Dept of Biological Sciences

19. **Determination of Potential Alterations in Liver and Serum IGF-1 Protein Levels Post-Transplantation of Young Ovaries into Aged CBA/J Female Mice.**  
Dania Abid, Jason Kanady  
Faculty: Shelley Cargill

---

**Department of Chemistry**

20. **Sub-5nm Silica Shell Encapsulation and Functionalization of Fluorescent Nanodiamonds for Bioimaging.**  
Perla J. Sandoval, Anida A. Len, Andres Arreola, Pomaiakaimaikalani Yamaguchi, Karen Lopez, Polo Tran, Ryan Robinson  
Faculty: Abraham Wolcott  
Collaborators: Dennis Nordlund, Stanford Synchrotron Radiation Lightsource and Virginia Altoe, the Molecular Foundry, Lawrence Berkeley National Laboratory

21. **Direct Amination of HPHT Nanodiamond Surfaces.**  
Cynthia Melendrez, Grace Jeanpierre, Jocelyn Valenzuela, Polo Tran, Alejandro Hernandez, Elena Favre, Melissa Gonzalez  
Faculty: Abraham Wolcott  
Collaborators: Dennis Nordlund, Stanford Synchrotron Radiation Lightsource

22. **Light Harvesting Techniques with PbSe Quantum Dots for Photovoltaic Applications and Nitrogen Doped ZnO Nanowire Arrays for Photoelectrochemical Water Splitting.**  
Ryan Robinson, Michael LeRoy, Roksana Kazemi, Tung Nguyen, Grace Jeanpierre, Crystal Percira, Maia Lister  
Faculty: Abraham Wolcott  
Collaborators: Dennis Nordlund, Stanford Synchrotron Radiation Lightsource

23. **Development of a CNT-Based Ultracapacitor-Battery Hybrid.**  
Ricki Menard, Michael Walsh, Jessica Sanchez, David Courter, Kanishka Rana, Shalaka Rahangdale  
Faculty: Roger Terrill

24. **Electrochemically Stimulated SERS.**  
Dennis Ashong, Melanie Fujiwara, Connor Cox, Ngoc-Huong Nguyen  
Faculty: Roger Terrill

25. **Development of Chemical Instrumentation for Instructional Purposes.**  
Toni Searcy, Caesar Munera  
Faculty: Roger Terrill

26. **Recombinant Expression of an Aedes aegypti Mosquito Salivary Gland Protease (SG-tSP1) Cloned into the pET29b Vector.**  
Kathy Lam, Lantz A. Bigay, Anthony Nguyen  
Faculty: Alberto A. Rascón, Jr.  
Collaborator: Dr. Jun Isoe, University of Arizona
27. Recombinant Expression and Purification of Aedes aegypti Serine Protease I Without Leader Sequence (AaSPI-NL).
My Anh Le
Faculty: Alberto A. Rascón, Jr.

28. Soluble Recombinant Expression of a Salivary Gland Serine Protease (SG-tSP1) from the Aedes aegypti Mosquito.
Lantz A. Bigay, Anthony Nguyen, Kathy Lam
Faculty: Alberto A. Rascón, Jr.
Collaborators: Dr. Jun Isoe, University of Arizona

29. Calorimetry Reveals Favorable Desolvation Energy for a Host-Guest Binding Model.
Elizabeth Vuong, Dominic Ngo
Faculty: Daryl K. Eggers

30. Optimizing DNA Hybridization Conditions for Microscale Thermophoresis Studies.
Christopher Trinh, Caroline Harmon
Faculty: Daryl K. Eggers

Juan Rangel
Faculty: Daryl K. Eggers

32. Chromophore Products of Cross Reactions among Organics at Upper Troposphere/Lower Stratosphere Aerosol Acidities: Implications for Climate.
Mei Yun Li, Michelia Dam, Evelin Ventura, Janaina de Sousa, Adrian Sandoval, Migel Clemente, Sai Somepalle, Fatima Hussain, Alex Shen, Rebecca Spangler
Faculty: Annalise Van Wyngarden

Thomas Nelson, Saul Perez Montano, Julie Bui, Eric Li, Kieu Ha, Linda Leong
Faculty: Annalise Van Wyngarden
Collaborators: Laura T. Iraci, NASA Ames Research Center, Moffett Field, CA

34. Effects of Cloud Formation on the Speciation of Glyoxal and Methylglyoxal Hydrates and Polymers in Aerosols.
Kimberly Houghton, Patricia Goh, Rebecca Spangler, Weston Schweitzer, Khaled Khaled, Jeffrey Berry
Faculty: Annalise Van Wyngarden

35. New Functional Groups for SADMET Polymerization.
Hasaan Rauf, Mami Horikawa, Josh Chen, Laica Kwong
Faculty: Chester Simocko

Alexis Sarabia, Hamdy Yahya, Jasmine Nguyen
Faculty: Chester Simocko
Collaborators: Dale L. Huber, Center for Integrated Nanotechnology, Sandia National Laboratories
Amalie Frischknect, Center for Integrated Nanotechnology, Sandia National Laboratories
NOTE: Posters 37A and 38A will be posted from 10:00am to 11:30am;
Posters 37B and 38B will be posted from 11:30am to 1:00pm

Seiichiro Watanabe, Theresa Q. Santos
Faculty: Maria T. Matyska-Pesek, Joseph J. Pesek

37B. Synthesis and Characterization of Three Silica Hydride-based Stationary Phases.
Seiichiro Watanabe
Faculty: Maria T. Matyska-Pesek, Joseph J. Pesek

38A. Metabolomics Characterization of Grape (Vitis vinifera) Skin Extracts by LC-TOF-MS Using Silica Hydride-based Stationary Phases.
Seiichiro Watanabe
Faculty: Maria T. Matyska-Pesek, Joseph J. Pesek

38B. Synthesizing Stationary Phases in HPLC using 1-Eicosene.
Adiba LalaGul, Irene Lin, Tina Nguyen, David Silva, Seiichiro Watanabe
Faculty: Maria T. Matyska-Pesek, Joseph J. Pesek
Collaborators: Microsolv Tech. Corp.

39. Characterization of Four Type-C Silica Columns using Resveratrol Analogues.
Joshua Topete
Faculty: Maria T. Matyska-Pesek, Joseph J. Pesek
Collaborators: Milton Hearn, Reinhard Boyse, Monash University, Melbourne, Australia

40. Towards Single-Chain Polymeric Nanoparticles as Synthetic Oxygenase Enzyme Mimics.
Victoria Tafuri, Khanh Nguyen, Charleston Chua, Vanshika Gupta, David Navarro, Harris Ordona
Faculty: Madalyn R. Radlauer

41. Embedding Iridium Pincer Complexes in Polymeric Scaffolds for Catalytic Alkane Dehydrogenation.
Jacob Hickey, Andrew Le, Joanne Ayoub, Thaw Z. Myint, Jessica C. Rodarte, Dana Wong
Faculty: Madalyn R. Radlauer

42. Verdazyls as Spin Probes for Biological Systems.
Alejandro Herrera, Jeffrey DaRos, Alissa Clements, Tony Pan
Faculty: David Brook
Collaborators: Kent Thurber, National Institutes of Health

Weiming Guan, Ian Kwong, Yu Bin Chen, Yexi Mo, Amir Mansouri
Faculty: David Brook

44. Valence Tautomerism in Verdazyl Coordination Compounds.
Christina Kung, Sherry Fu, Dorothy Chung, Servando Ponce, Connor Fleming
Faculty: David Brook
45. **Inhibition of Cationic Antimicrobial Resistance in *Pseudomonas aeruginosa*.
   Kendra Cortez, Rodger de Miranda, Natalie Kahler, Sarah Matthews, Margaryta Makhanov, 
   Lucero Sandoval, Sabrina Sung, Minh Tran, Cassandra Villicana
   Faculty: Laura Miller Conrad

46. **Using Photoaffinity Labeling to Determine Target Proteins in *Pseudomonas aeruginosa*.**
   Kareem Aboulhosn, Zi Jun Chen, Rebecca Moore, Dominic Ortega
   Faculty: Laura Miller Conrad

47. **Disrupting Bacterial Communication by Inhibition of LuxI-Type Synthase CviI.**
   Terrence Nguyen, Anthony Balistreri, Matthew Aguilar, Arturo Chavez, Mellanie Gomes, 
   Alexander Jiu
   Faculty: Laura Miller Conrad

48. **Light-driven P450 Enzymes for Selective C-H Functionalization.**
   Mary Melkie, Carolina Sulca, Minh Do, Jeffrey Li, Barbara Sandoval, Alejandra Toledo, 
   Mallory Kato
   Faculty: Lionel Cheruzel

49. **Evolving Light-driven P450 Biocatalysts.**
   Bridget Foley, Wesley Nguyen, Jennifer Li, Kasey Leong, Jane Juan, Mallory Kato
   Faculty: Lionel Cheruzel

50. **Elucidating Allosteric Interactions Within the SIRT1 N-terminal Domain.**
   Carla Marie Peralta, Andy Kwong
   Faculty: Ningkun Wang

51. **Development of a FRET Assay to Study SIRT1 Conformational Change.**
   Erick Espino, Tina Nguyen
   Faculty: Ningkun Wang

52. **Sequence Entropy and Other Descriptors Identify a Possible Conformational Switch: Case Study of an Allosteric Dodecameric Polyamine Acetyltransferase SpeG.**
   Saira Montermoso, Jonathan Oribello, Angelina Huynh, Jason Graham
   Faculty: Brooke Lustig, Ningkun Wang
   Collaborators: Misty Kuhn, San Francisco State University

53. **Computational Models Exploring the Role of Flexibility in Binding Tat Peptide to TAR RNA.**
   Thanh Le, Ryan Yu, Truc Le, Arjit Misra, Toan Nguyen, Summer Batasin
   Faculty: Brooke Lustig

54. **Screening of California Native Plants for Bioactive Natural Products.**
   Stina Al-Maleh, Amilcar Barrios, Junghyuck (Jay) Jin, Chris Manith, Bao Nguyen, Andy Thai, 
   Jennifer Tsai
   Faculty: Roy K. Okuda

55. **California Native Plants as Sources of Bioactive Natural Products: Preliminary Studies of *Grindelia stricta* and *Emmenanthe penduliflora*.**
   Junghyuck (Jay) Jin, Justin Dang
   Faculty: Roy K. Okuda
   Collaborator: Lars Rosengreen, SJSU Dept of Biological Sciences
56. **Compression of Wearable Body Sensor Network Data Using Improved Two Thresholds Two Divisors Data Chunking Algorithm.**
    Robinson Raju
    Faculty: Melody Moh

57. **Cache Management for Cloud Radio Access Network and Mobile Edge Computing in 5th Generation Networks.**
    Deepika Pathinga Rajendiran
    Faculty: Melody Moh
    Collaborator: Random Access Networks Group, Nokia Research

58. **Joint Computation Offloading and Prioritized Scheduling for Mobile Edge Computing.**
    Lingfang Gao
    Faculty: Melody Moh

59. **PediatricDB: Data Analytics Platform for Pediatric Healthcare.**
    Shantanu Deshmukh
    Faculty: Natalia Khuri

60. **Analysing Android Adware.**
    Suprja Suresh
    Faculty: Mark Stamp
    Collaborators: Fabio Di Troia, San José State University

61. **A Comparison of Machine Learning Classifiers for Acoustic Gait Analysis.**
    Jasper Huang
    Faculty: Mark Stamp
    Collaborators: Fabio Di Troia, San José State University

62. **Deep Learning for Image-Based Malware Classification**
    Sravani Yajamanam
    Faculty: Mark Stamp
    Collaborators: Fabio Di Troia, San José State University

63. **text2collage – Visualizing Text as a Collage of Images.**
    Vandana Kannan
    Faculty: Dr. Sami Khuri

64. **Using Filters in Time-based Movie Recommender Systems.**
    Ravee Khandagale
    Faculty: Teng Moh

65. **Ontology Based Technical Skill Similarity.**
    Yeshwanth Balachander
    Faculty: Teng Moh

66. **Micro-expression Recognition Using Spatiotemporal TextureMap and Motion Magnification.**
    Shashank Shivaji Pawar
    Faculty: Teng Moh
Department of Geological Sciences

67. **Structure and Lithology of the Spider Glacier Unit, North Cascades, Washington: Implications for the Deep Levels of a Continental Magmatic Arc.**
   Colin P. Phillips  
   Faculty: Robert B. Miller  
   Collaborators: Kirsten Sauer, University of Nevada, Reno (UNR); Stacia Gordon, UNR

68. **Movement History of the Pasayten Fault Zone, Southern British Columbia: Insights into Large-Scale Transport Along the North America Continental Margin.**  
   John Lee  
   Faculty: Robert B. Miller

69. **Characterization of Jarosite-bearing Outcrops at Mawrth Vallis, Mars.**  
   Jacob Danielsen  
   Faculty: Ellen Metzger  
   Collaborators: Janice Bishop, SETI Institute (Mountain View, California)

70. **Revising Introductory Geology Labs to Increase Level of Inquiry and Student Engagement.**  
   Beth Johnson  
   Faculty: Ellen Metzger

71. **Rapid Construction of the Miocene Aztec Wash Pluton (Nevada) From High-Precision U-Pb Zircon Geochronology.**  
   Matthew J. Leigh  
   Faculty: Jonathan S. Miller  
   Collaborators: Terrence J. Blackburn and Graham H. Edwards, Dept. of Earth and Planetary Sciences, UC Santa Cruz; Andrew Kylander-Clark, Dept. of Earth Science, UC Santa Barbara

Department of Mathematics and Statistics

72. **An Efficient Algorithm for Spectral Clustering with Cosine Similarity.**  
   Jeffrey Lee, Xin Xu, Zhengxia Yi, Xin Zhang  
   Faculty: Guangliang Chen

73. **Landmark-based Spectral Clustering Methods for Large Image and Text Data.**  
   Scott Li, Jiye Ding, Maham Niaz  
   Faculty: Guangliang Chen

74. **Large-scale Spectral Clustering using Diffusion Coordinates on Landmark-based Bipartite Graphs.**  
   Khiem Pham  
   Faculty: Guangliang Chen

75. **Classification via a family of Parsimonious Generalized Hyperbolic Mixtures.**  
   Mengyuan Ren  
   Faculty: Cristina Tortora  
   Collaborators: Brian Franczak, MacEwan University, Canada
Department of Meteorology and Climate Science

76. Does Urban Heating Spark Thunder Potential?
    Arianna M. Jordan
    Faculty: Sen Chiao

77. WRF Microphysics Sensitivity and High-Resolution Radar Data Assimilation in the Bay Area.
    Dalton Behringer
    Faculty: Sen Chiao

78. Asian Long-Range Transport Linkage to Atmospheric River Events in California.
    Catherine Liu
    Faculty: Sen Chiao

79. Cloud Phase Separation Algoritms Based on in-situ Airborne Observations.
    John D’Alessandro
    Faculty: Minghui Diao

Department of Physics and Astronomy

80. Simulation of Quantum Dynamics of Atoms in Optical Lattices.
    Victoria Hickman, Shannon Welch, Maxwell Casebolt
    Faculty: Ehsan Khatami

81. Learning Thermodynamics with Restricted Boltzmann Machines.
    Kristopher McBrian
    Faculty: Ehsan Khatami

82. Studying Galaxies Through Imaging and Data Mining.
    Devin Cunningham, Jean Donet, Hirenkumar Thummar
    Faculty: Aaron Romanowsky

Acknowledgements:

Thanks to the College of Science for supporting this event, including Dean Michael Kaufman, Stan Vaughn, Lee Veliz, Cher Jones, Marco Parent, Mike Stephens, Steve Boring, and other College Staff. Cathy Kozac, Steve Boring and colleagues in the COS Computer Center printed many of the posters for the SRD. Congratulations and thanks to all the hard working undergraduate and graduate students and their faculty mentors who presented their work today!