

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



SAN JOSÉ STATE
UNIVERSITY

COLLEGE OF
SCIENCE

This event is wheelchair accessible. For additional accommodations, contact
Dr. Roy Okuda (408) 924-2525 by April 20, 2018

The 14th Annual SJSU College of Science
Student Research Day
April 27, 2018
10:00am to 1:00pm
Duncan Hall
PROGRAM

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 Intraspecific 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
- 5. Effects of Low Tide Heat Exposure on the Internal Body Temperatures of California Mussels (*Mytilus californianus*) in an Artificial Mussel Bed.**
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, Nebati 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.**
Aruna Varshney, Kelli Benedetti, Katherine Watters, Raakhee Shankar, David Tatarakis, Doris Coto Villa, Khristina Magallanes, Venia Agenor, William Wung, Fatima Farah, Nebati Ali, Nghi Le, Jacqueline Pyle, Amber Farooqi, Zanett Kieu
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, Harnoor Virk
Faculty: Bree Grillo-Hill
16. **Identifying and Characterizing pH-Sensitive Proteins.**
Hillary Gates, Andin Josipovic, 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, Pomaikaimaikalani 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, Rokhsana Kazemi, Tung Nguyen, Grace Jeanpierre, Crystal Pereira, 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 (AaSPl-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
- 31. Concentration Effects on DNA: DNA Binding Thermodynamics.**
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
- 33. Evidence for Products of Cross-reactions in Organic Films Formed on Sulfuric Acid Solutions at Upper Troposphere/Lower Stratosphere (UT/LS) Aerosol Acidities.**
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
- 36. Thermal Stability of Mixed Polymer Brushes.**
Alexis Sarabia, Hamdy Yahya, Jasmine Nguyen
Faculty: Chester Simocko
Collaborators: Dale L. Huber, Center for Integrated Nanotechnology, Sandia National Laboratories
Amalie Frischknecht, 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**

- 37A. Analytical Method Development for the Detection of Phytocannabinoids Using the Silica Hydride-based Prototype Phases.**
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 Ordon
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
- 43. Radical Substituted Phenylenediamines, Oligoanilines and Thiophenes: Models for Organic Spintronic Systems.**
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, Junghyuk (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*.**
Junghyuk (Jay) Jin, Justin Dang
Faculty: Roy K. Okuda
Collaborator: Lars Rosengreen, SJSU Dept of Biological Sciences

Department of Computer 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.**
Supraja 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 Algorithms 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!