

# Susan L. Elrod, Ph.D.

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## EDUCATION

- 1995 Ph.D., *Genetics*, University of California, Davis,  
Dissertation: *Mutational Analysis of CDC36 in Saccharomyces cerevisiae*
- 1986 B.S., *Biological Sciences*; Minor, *Chemistry*, California State University, Chico  
Honors Research: *Ames Testing of Regional Farm Soils*  
President, Associated Students Inc. (1985-6)  
Board of Directors Member, Associated Students Inc. (1984-5)

## ACADEMIC AND RESEARCH POSITIONS

- Fall 2008 – present **Full Professor**, Biological Sciences Department, Cal Poly, San Luis Obispo  
(currently on professional leave, returning January 2013)
- Fall 2003 – 2008 **Associate Professor**, Biological Sciences Department, Cal Poly, San Luis Obispo
- Fall 1997 – 2003 **Assistant Professor**, Biological Sciences Department, Cal Poly, San Luis Obispo
- May 1995 – Aug 1997 **Postdoctoral Fellow**, Novozymes Biotech, Inc., Davis, CA
- Feb 1988 – Aug 1990 **Research Associate**, Hematology & Oncology Laboratory, University of California  
Medical Center, Davis, CA
- May 1987 – Jan 1988 **Research Assistant**, Biogen IDEC, Inc., Mountain View, CA

## HIGHER EDUCATION LEADERSHIP EXPERIENCE

- Sept 2012 - present **Senior Scholar, Institutional Change and Leadership Development in STEM**,  
Association of American Colleges & Universities (AAC&U), Washington, DC  
*Responsible for continuing to lead Project Kaleidoscope's Keck/PKAL STEM Education  
Effectiveness Framework project in California through December 2013  
(<http://www.aacu.org/pkal/educationframework/index.cfm>); continued work on selected  
projects and programs*
- Jan 2010 - Sept 2012 **Executive Director**, Project Kaleidoscope (PKAL), Association of American Colleges &  
Universities (AAC&U), Washington, DC  
*Responsible for leadership and operations of national organization dedicated to advancing  
"what works" in undergraduate STEM (science, technology, engineering, and mathematics)  
higher education (<http://www.aacu.org/pkal>), including setting strategic goals,  
conceptualizing new initiatives, oversight of a portfolio of six national programs and projects,  
coordination with other AAC&U offices, and dissemination of program outcomes and trends  
in STEM higher education.*
- Shaped new mission, vision and goals for PKAL
  - Designed and executed a plan to transition PKAL from an independent national organization into full partnership with AAC&U
  - Sharpened AAC&U's focus on issues of STEM higher education in the strategic plan, national programs, publications and conferences
  - Conceived and launched three national initiatives, with total funding of \$1.5 million on sustainability issues in the undergraduate curriculum, STEM transfer student success

and institutional effectiveness

- Completed Keck/PKAL Facilitating Interdisciplinary Learning project funded by the W.M. Keck Foundation
- Led PKAL's Summer Leadership Institute for early and mid-career STEM faculty; grew participation numbers; created a sustainable budget model; enhanced the curriculum and evaluation process
- Established synergistic collaborations with other AAC&U offices
- Oversight for program and operating budgets of \$2 million; built and supervised staff of 3 FTE
- Expanded regional and national opportunities for STEM faculty and leadership development
- Supported teams of faculty leaders, chairs, deans, provosts and presidents with responsibility for executing PKAL programs
- Cultivated success of dozens of cross-disciplinary campus teams participating in PKAL projects
- Promoted growth of PKAL community to nearly 7,000 members nationwide
- Fostered strategic alliances with other national organizations and scientific societies
- Created a comprehensive communications strategy for PKAL that included web, blog, *Facebook*, *Twitter* and online collaboration environments
- Served as higher education campus consultant and AAC&U institute faculty member

July 2009 – **Associate Dean, Strategic Initiatives**, College of Science and Mathematics, California  
Dec 2009 Polytechnic State University, San Luis Obispo

*Responsible for creating an integrated vision for Cal Poly's science and mathematics education programs, including teacher credential and graduate programs, elementary teacher undergraduate education, all of which are administratively housed within the College of Science and Mathematics.*

- Led committee of faculty from both colleges in drafting an initial vision for integration

Aug 2007 – **Director, University Center for Excellence in Science and Mathematics Education**  
Dec 2009 (**CESaME**), California Polytechnic State University, San Luis Obispo

*University-level appointment responsible for interdisciplinary campus center focused on innovative program development for advancing P-20 STEM (science, technology, engineering and mathematics) education (<http://cesame.calpoly.edu>).*

- Established new campus center guided by a collaboratively generated vision and strategic plan
- Obtained over \$2 million in external funding for STEM education programs and managed relationships with funding foundations and corporate sponsors
- Oversight for program and operating budgets of \$500,000 and an additional \$700,000 in special project budgets; supervised staff of 4 FTE plus two part-time faculty program directors
- Built statewide STAR – *Science Teacher and Researcher* – summer research program for aspiring and early career science teachers on behalf of the California State University (CSU) system
- Formed relationships with federal laboratories and funding partners in collaboration with Cal Poly President's Office to create a national STAR program expansion plan
- Fostered development of new undergraduate programs to enhance science and math teacher education programs at Cal Poly
- Secured funding from the Bill and Melinda Gates Foundation and the Stephen Bechtel Fund for a multi-partner initiative to develop a STEM education network for the state of California (now known as CSLNet.org); managed project operations and executed statewide P-16 focus groups
- Built a collaborative community among university faculty from across campus for cross-

- college program development in STEM teacher education
  - Developed community relationships for P-16 STEM collaborations
- Mar 2007 –  
Dec 2007
- Chair, Western Association of Schools and Colleges (WASC) Reaccreditation Committee**, California Polytechnic State University, San Luis Obispo  
*Responsible for leading campus committee charged with drafting WASC institutional self-study proposal.*
- Facilitated campus-wide engagement in development of self-study themes
  - Co-authored successful institutional self-study proposal (<http://www.wasc.calpoly.edu>)
- Aug 2006 –  
May 2007
- American Council on Education (ACE) Fellow**, Colorado College, Colorado Springs, CO  
*Participant in selective national higher education leadership development program.*
- Studied the scope, structure and function of Colorado College's interdisciplinary majors; conducted focus group interviews regarding interdisciplinary programs at other institutions
  - Consulted on Colorado College's North Central Association of Schools and Colleges re-accreditation report, focusing on analysis of assessment and accountability measures, including the National Survey of Student Engagement (NSSE) and the Collegiate Learning Assessment (CLA)
  - Facilitated internal data gathering and external review of the Crown faculty development center
  - Participated in President's cabinet-level evaluation of Colorado College's strategic plan
- Jun 2005 –  
Jun 2006
- Special Assistant to the Provost**, California Polytechnic State University, San Luis Obispo  
*Responsible for university-level, interdisciplinary center focused on innovative program development for advancing P-20 STEM (science, technology, engineering and mathematics) education.*
- Led working groups of faculty and staff to create university-wide objectives and revised mission statement; shepherded approval process through Academic Senate
  - Developed and executed plan for program review of Academic Programs Office, including setting milestones and timeline; helped craft Academic Programs Office mission statement and campus constituent focus group methodology for review; wrote report
- Fall 2003 –  
Spr 2005
- Associate Chair**, Biological Sciences Department, California Polytechnic State University, San Luis Obispo,  
*Responsible for department scheduling, curriculum review and development, program review, and student advising, and special projects.*
- Facilitated departmental effort to revise introductory course series for majors; coordinated implementation of new courses; secured funds to pilot new courses; negotiated book adoption contract for new series
  - Oversight for department curriculum and assessment efforts
  - Created and managed the department class, faculty and laboratory facility schedules (~40 different courses per quarter with most consisting of lecture and laboratory components, an average of 10,000 student credit units taught each quarter by 30 tenured/tenure-track faculty and 20 part-time faculty); developed data-driven methods for scheduling of core major courses; effectively managed part-time faculty budget (\$180,000 per year)
  - Organized initial phases of department program review
  - Coordinated departmental advising events for incoming students and freshmen; advised students with special issues
- Jan 2002 –  
Dec 2003
- Assistant Director**, Center for Teaching and Learning (CTL), Cal Poly, San Luis Obispo  
*Responsible for coordinating faculty development workshop program, including new faculty*

orientation, *Effective Teaching and Learning* course and weekly workshops.

- Conceived and launched peer-led, faculty development program with weekly *Teaching Well* workshops and a quarter-long *Effective Teaching and Learning* course based on *Understanding by Design* (Wiggins and McTighe, 1998)
- Co-taught *Effective Teaching and Learning* course and *New Teacher Workshop*; facilitated 4 workshops per year on various topics
- Developed teaching resource notebook for new faculty, edited and wrote articles for quarterly newsletter, organized and edited web content for Cal Poly's Faculty web pages; managed CTL web content
- Continued as a Faculty Associate through June 2006 with responsibility for co-teaching 10-week *Effective Teaching and Learning* course and facilitated 2-3 workshops per year on various topics related to teaching and learning, reviewing CTL faculty development grant proposals and mentoring recipients

## SCHOLARLY ACHIEVEMENTS

### **Educational Publications**

- Elrod, S.L. (in preparation) *Development of Faculty Leaders in STEM Education*
- Roth, M.J.S. and S.L. Elrod (in preparation) *Framing Leadership for Sustainable Interdisciplinary Programs*
- Polacek, K.M., E. Ingram and S.L. Elrod (in preparation for submission to CBE-Life Sciences Education) *Genetics Misconceptions: Review and Implications for Undergraduate Learning*
- Elrod, S.L. and M.J.S. Roth (in press) *Leadership for Interdisciplinary Learning: A Practical Guide to Mobilizing, Implementing, and Sustaining Campus Efforts*. Washington, DC: Association of American Colleges and Universities.
- Kezar, A. and S.L. Elrod (2012) *Facilitating Interdisciplinary Learning: Lessons from Project Kaleidoscope*. Change: The Magazine of Higher Education **44** (1): 16-25.
- Elrod, S.L. (2011) *What Works in Facilitating Interdisciplinary Learning in Science and Mathematics*. Washington, DC: Association of American Colleges and Universities.
- Elrod, S.L., D. Husic and J. Kinzie (2010) *Research and Discovery Across the Curriculum*, Peer Review **12** (2): 5-9.
- Elrod, S.L. (2010) *Project Kaleidoscope 2.0: Leadership for Twenty-First-Century STEM Education*, Liberal Education **96** (4): 24-28.
- Garvin-Doxas, K., M. Klymkowsky and S.L. Elrod (2007) *Building, Using and Maximizing the Impact of Concept Inventories in the Biological Sciences: Report on a National Science Foundation-sponsored Conference on the Construction of Concept Inventories in the Biological Sciences*, CBE-Life Science Education **6**: 277-282.
- Elrod, S.L. and M.M. Somerville, (2007) *Literature-Based Scientific Learning: A Collaborative Model*, Journal of Academic Librarianship. **33**(6): 684-691.

### **Textbooks and Test Banks**

- Elrod, S.L. and William Stansfield (2009) *Schaum's Outline of Theory and Problems of Genetics*. 5<sup>th</sup> edition. New York: McGraw-Hill.
- Test Bank for Pierce's *Genetics: A Conceptual Approach* textbook (2005), New York, NY: W.H. Freeman Publishers.

### **Scientific Research Publications** (student co-authors are underlined)

- Lord, N., C. Kaplan, P. Shank, C. Kitts and S.L. Elrod. (2002) *Assessment of fungal diversity using terminal restriction fragment (TRF) analysis: Comparison of 18S and ITS ribosomal regions*. FEMS Microbiology Ecology **24**(3): 327-337
- Elrod, S.L., A. Jones, R. Berka, J.R. Cherry. (2000) *Cloning of the Aspergillus oryzae hemA gene and its use as a selectable marker*. Current Genetics **38**: 291-8
- Hatcher, S.L.S., R.L. Teplitz, S.L. Elrod. (1990) *Rapid Alkaline Transfer of Low Molecular Weight DNA From Nusieve Gtg Agarose Gels*. Biotechniques **9**(3):260-262

Scudder, S.A., S.L. Elrod, P.H. Gumerlock, E.S. Kawasaki. (1990) *Detection of the Multidrug Resistance (MDR) Gene Using the Polymerase Chain Reaction (PCR): Correlation with in vitro Drug-Testing*. *Clinical Research*. **38**(1): A133.

### **Patents**

Elrod, S.L., *Polypeptides having Uroporphyrinogen Decarboxylase Activity and Nucleic Acids Encoding Same*. U.S. Patent 6,200,795, March 13, 2001.

Elrod, S.L., J. Cherry and A. Jones. *A Method for Increasing Hemoprotein Production in Filamentous Fungi*. U.S. Patents 6,261,827, August 8, 2000; 6,100,057, July 17, 2001.

Jensen, E. B., S.L. Elrod, J. Cherry. *Methods for Overproducing Polypeptides in Respiratory-Deficient Cells*. U.S. Patent 5,891,669, April 6, 1999.

Elrod, S.L. and J. Cherry. *Aspergillus oryzae 5- Aminolevulinic Acid Synthases and Nucleic Acids Encoding Same*. U.S. Patents 5,871,991, February 16, 1999; 5,958,747, September 29, 1999.

## **GRANTS AND CONTRACTS**

### **Science Education Grants and Contracts**

~\$4,000,000

#### At Project Kaleidoscope

Elrod, S.L. and A. Kezar (January 2012 - December 2014) *Now What? An Institutional STEM Effectiveness Framework for Bringing National Recommendations to Scale*, W.M. Keck Foundation

Elrod, S.L. (June 2011 - September 2012) *PKAL: Ramping Up for STEM Success*, Bill and Melinda Gates Foundation.

Elrod, S.L. (January 2010 - December 2013) *PKAL: Mobilizing Disciplinary Societies - Education for a Sustainability Future*, Department of Education - Fund for the Improvement of Postsecondary Education (FIPSE # P116B100142).

Elrod, S.L., and J.L. Narum (January 2008 - June 2012) *PKAL: Facilitating Interdisciplinary Learning*, W.M. Keck Foundation

Cunningham, B., J. Young, and S.L. Elrod (January 2008 - December 2011) *PKAL: STEM Leaders Developing Leaders*, National Science Foundation, #0734998.

#### At Cal Poly

Elrod, S.L. (September 2009 - December 2010) *A National Pilot for the STAR (Science Teacher and Researcher) Program*, National Science Foundation Noyce Program, # 0952013

Elrod, S.L., S. Hackwood, A.P. Diaz, D. Howard-Greene, and S. Ogren (January - December 2009) *California STEM Innovation Network Planning Grant*, Bill and Melinda Gates Foundation and Stephen Bechtel Fund

Elrod, S.L. (Mar 2009 - Mar 2010) *Science Teacher and Researcher (STAR) Program*, Stephen Bechtel Fund

Elrod, S.L., and J. Bissell (February 2008 - February 2009) *Science Teacher and Researcher (STAR) Program*, Stephen Bechtel Fund and Fluor Corporation Foundation

Elrod, S.L. (January 2007 - December 2009) *Literature-Based Scientific Learning in Genetics*, National Science Foundation, # 0633351; *Conceptual Assessment in Biology Meeting II Supplement*

### **Scientific Research Grants and Contracts**

~\$450,000

Kitts, C., R. Cano, and S.L. Elrod (2001 - 2004) *Development of microbial tools for analysis of bioremediation at the Guadalupe Dunes*, UNOCAL Corp

Elrod, S.L. (2000 - 2002) *Analysis of Fungal Molecular Diversity during Phytoremediation in a Petroleum-Contaminated Dune System*, CSUPERB (California State University Programs for Education and Research in Biotechnology)

Elrod, S.L. (1997, 1998, 1999, & 2000) *Expression of bovine beta-casein in Aspergillus oryzae*. University Summer Services Grants and Faculty Development Grants (Cal Poly)

National Institutes of Health Molecular and Cellular Biology pre-doctoral training grant (1991 - 1992)  
University of California, Davis Graduate Research Awards (1990 - 93)

## SELECTED PROFESSIONAL ACCOMPLISHMENTS

### ***National Conferences and Workshops in Higher Education***

AAC&U Institute on Integrative Learning and the Departments; Shared Futures Institute; Institute on General Education and Assessment; Institute on Engaging Departments (institute faculty)  
PKAL STEM Education Framework project meeting (project leader & meeting facilitator)  
Ramping Up for STEM Success Action Labs I & II (project leader & meeting facilitator)  
PKAL Summer Leadership Institutes (Institute leader)  
California State University Engaged Department Institute on Community-based Learning in STEM (institute faculty)  
PKAL Mobilizing Disciplinary Societies for Sustainability project meetings (project leader & meeting facilitator)  
PKAL/AAC&U Engaged STEM Learning Conference (meeting facilitator)  
PKAL Facilitating Interdisciplinary Learning Roundtable on the Future of Interdisciplinary Learning (project leader & meeting facilitator)

### ***Campus Activities and Consulting in STEM Education***

Howard Hughes Medical Institute - Collaborative Science Education Program (consultant)  
University of La Verne - Biology Department Strategic Planning (consultant)  
University of Alabama, Birmingham - College of Science and Math Review (consultant)  
Zayed University, Dubai, United Arab Emirates - Science Education Program (consultant)  
Morehouse College - 21<sup>st</sup> Century Learners and Curriculum Design (seminar and workshop)  
CSU, Long Beach - Engaged STEM Learning for the 21<sup>st</sup> Century (seminar and workshop)  
The Ohio State University - Interdisciplinary Learning; Inquiry-based Laboratory Design (seminar)  
Fashion Institute of Technology - The Science Behind the Design (seminar)  
Lafayette College - Defining General Education Science Learning Outcomes (workshop)  
Miami Dade College - Campus Priorities for STEM Education (seminar and workshop)  
Mount Royal University - Undergraduate Research and High Impact Practices in STEM (seminar)

### ***Recent Higher Education Conference Presentations and Keynote Addresses***

2011 Council of Colleges of Arts and Sciences (CCAS) Annual Meeting, *Leadership for Interdisciplinary Learning in STEM*, conference presentation with David Brakke and Judith Dilts  
Department of Education Fund for the Improvement of Postsecondary Education (FIPSE) Project Director's Conference, *Faculty Development and STEM Education*, panel presentation  
Transforming Education Conference, *PKAL: Leadership for Implementing Change in STEM Education*, conference presentation with Judith Dilts and Lynn Zimmerman  
Teaching Scholar's Institute Conference, University of Oklahoma, keynote address  
American Psychology Association Education Leadership Conference, panel presentation on interdisciplinary programs  
University of Wisconsin, Whitewater College of Science and Mathematics Fall Conference, keynote address

2010 International Conference on Scholarship of Teaching and Learning (SOTL), keynote address  
University of Wisconsin System Teaching and Learning Conference, keynote address

### ***Advisory and Review Boards***

Current WASC (Western Association of Schools and Colleges) Review Team for Academy of Art University  
National Association of Geoscience Teachers *On the Cutting Edge* Initiative Advisory Board  
Rochester Institute of Technology College of Science and Mathematics Advisory Board  
Howard Hughes Medical Institute (HHMI) NEXUS Project Advisory Board  
AAC&U Shared Futures/Global Learning in General Education Project Advisory Board  
Learning Spaces Collaboratory Advisory Board

CSU, Chico College of Natural Sciences Advisory Board

Previous Primarily Undergraduate Institutions (PUI) STEM NSF ADVANCE Program Advisory Board  
 AAC&U Preparing Critical Faculty for the Future (PCFF) project (funded by the National Science Foundation HBCU-UP) Advisory Board  
 Association of Public and Land Grant Universities (APLU) Minority Male STEM Initiative Grant Reviewer  
 National Science Foundation Transforming Undergraduate Education in STEM (TUES) education grant reviewer  
 Biotechnology Industry Advisory Council, Cal Poly  
 California State University Programs for Education and Research in Biotechnology (CSUPERB), Faculty Consensus Group

### **Professional Society Membership**

American Association for the Advancement of Science (AAAS), Section Q (Education)  
 American Institute for Biological Sciences (AIBS)

## **SELECTED UNIVERSITY SERVICE AND GOVERNANCE EXPERIENCE**

### **California State University System**

**Representative**, CSU Lower Division Transfer Pattern Meetings Spring 2005  
**Co-organizer**, CSU Biology Curriculum Initiative Workshop Apr 2004

### **University**

**Chair**, Academic Senate Curriculum Committee 2004 – 2006  
**Chair**, Status of Women Committee 2005 – 2006  
**Member**, Committee for the Selection of a Provost and Vice President of Academic Affairs 2004 – 2006  
**Vice Chair**, Academic Senate 2003 - 2004  
**Member**, Science and Technology General Education committee 2001 – 2003

### **College of Science and Mathematics**

**Member**, Transition Team for College of Education and Liberal Studies Program merger with the College of Science and Mathematics Jan '09 – Dec '09  
**Member**, Assessment Committee 2001- 2006  
**Organizer**, Biotech Industry Career Day May 1999 – 2006

### **Biological Sciences Department**

**Director**, Curriculum and Scheduling Committee 2003 – 2005  
**Member**, Hiring Committees; Tenure and Promotion Review committees 1999 - 2009

## **SELECTED HONORS AND AWARDS**

Apple Polysher Teaching Award, Poly Reps, Cal Poly – San Luis Obispo 1998  
 National Woman's Political Caucus Outstanding Woman Student Leader, Chico, CA 1985, 1986  
 Honors Research Program, CSU Chico 1984-85  
 Omicron Theta Epsilon Biological Honor Society Scholarship, CSU Chico 1984

