

CUREs: Course Based Undergraduate Research Experiences at UC Merced

Acknowledgments:

Jim Whalen and BIO Instructional Lab Staff Team

Center for Engaged Teaching and Learning (CETL)

James Zimmerman and Sarah Frey, Office of Undergraduate Education

BIO Faculty who have been involved so far

(Jessica Blois, Juris Grasis, Laura Beaster-Jones, Maggie Sogin, Marcos Garcia-Ojeda, Mark Sstrom, Mike Cleary, Stefan Materna, Stephanie Woo)

Inclusive Excellence Grantee Institutions



UNIVERSITY OF CALIFORNIA
UCMERCED

Carnegie Classification:

- Baccalaureate
- Master's
- Research 1
- Research 2
- Research 3
- Focus on serving students from underrepresented groups



<https://www.hhmi.org/science-education/programs/inclusive-excellence-1-2>



The overall **goal** of this initiative is to determine the **best practices** that will result in **inclusive excellence in STEM** at institutions of higher education.

Building Capacity for Inclusive Excellence in Biological Sciences

*Students (71% FG,
57% URM) as
valuable assets and
future leaders*

*Research-trained
faculty as
responsible
change agents*

**Aim 1:
Faculty
Development
Program**

Active Learning
Student-Centered
Pedagogy
Reinforce Core
Concepts
Research Week
Scientific Self

Empathetic
mentoring
Growth mindset
Sense of
belonging
Cultural
matching
Bobcat/Family
Day

**Faculty with
Students**

Inclusive Excellence

**Aim 2:
Student-
Centered
Laboratory
Research
Experiences**

**Institutional
Change**

**Aim 3:
Students with
Faculty in
Learning
Support
Communities**

**Curiosity
Perseverance
Resilience
Persistence**

Why CUREs at UC Merced?

- To provide all BIO undergraduates the opportunity to engage in the process of scientific discovery and hypothesis testing as part of their regular course sequence. (**overcoming barriers**)
- A validated high-impact, student-centered strategy that promotes student persistence in science, development of relevant skill sets, and critical thinking ability and intellectual independence.
- CUREs align with UCM research mission
- CUREs align with student-centered research university culture
- Undergraduate research experiences improves student retention and quality of learning, especially from URM groups
- Students will learn research skills that are attractive to future employment (critical thinking, problem solving, utilizing creativity, collaboration, data acquisition, data analysis, written and oral communication)
- CUREs improve student confidence and self-efficacy, lab skills and knowledge about research
- CUREs can diversify scientific research by teaching students about the cultural norms important to succeed in scientific research

Faculty and Student Voices - Virology CURE



Faculty and Student Voices – Microbiology CURE



Goal: by the end of Spring 2023, UC Merced BIO will increase the number of upper division CUREs from three to six

BIO 120L: Microbiology Lab
(Small World Initiative)

BIO 127LA/LB: Virology Lab (SEAPHAGES)

BIO 150L: Developmental Biology Lab
(UC Merced's home-grown CURE)

BIO ????: Molecular Biology Lab
(CRISPR/Cas9 methods)

BIO ????: Genetics Lab
(GWAS and behavior in *Drosophila*)

BIO ????: Ecology Lab
(on the California Natural Reserve)

Building Capacity for Inclusive Excellence Curriculum Strategies in the Biological Sciences



**Laura
Beaster-Jones**



**Marcos
Garcia-Ojeda**



**Petra
Kranzfelder**



**James
Zimmerman**



**Jennifer O.
Manily**



**UC Merced HHMI Inclusive Excellence in
Science Education Grant, # GT11066**

<https://hhmi-ie.ucmerced.edu/>