BIOCHEMISTRY AND MOLECULAR BIOLOGY
COLORADO STATE UNIVERSITY

BC601 – Responsible Conduct in Biochemistry

Spring 2025

Instructor: Chaoping Chen, MRB 233, 491-0726 (office), Chaoping.Chen@colostate.edu

Teaching and Learning Format:

- This course meets in person at MRB 230 on Fridays 10 -11:50 am, running from Feb 14th through Apr 18th (8 weeks).
- This class will include a combination of lectures, in-class and Canvas-based discussions, student-led case studies, and online Responsible Conduct of Research (RCR) training.

Intended Audience:
This class is designed for all M.S. and Ph.D. students in Biochemistry, as well as postdoctoral researchers, research scientists, and research associates who are interested in or required to complete F2F RCR training to fulfill University and Federal requirements.

Student learning outcome and goals:

- Develop a framework for principled decision-making in scientific research, with a focus on biomedical sciences. This training is critical for students beginning their research careers and for all researchers who have not previously received RCR training or require an updated RCR course.
- Gain a comprehensive understanding of RCR principles, specifically as they relate to Biochemistry and the Biomedical Sciences on the following topics:
  1) Ethical reasoning in research, including issues related to data collection, publishing, peer review, and grant writing
  2) Proper handling of experimental data, covering data recording, analysis, bias, and reproducibility.
  3) Best practices in data management, including the ethical use of image-editing software (e.g., Photoshop), cropping of gels, and maintain accurate and traceable research notebooks.
  4) Publication practices and authorship ethics, along with an awareness of research misconduct including falsification, fabrication, and plagiarism
  5) Ethical and humane treatment of research model animals, emphasizing the 3 R's: replacement, reduction, refinement.
  6) Ensuring rigor and rigor and reproducibility in scientific research.

Class schedule:

Date	Instructor	Topic
Feb 14	Moti Gorin, PhD – CSU Bioethicist	Moral theories, Ethical frameworks
Feb 28	Chaoping Chen	Introduction and Course Overview
Mar 7	Zachary Callahan, PhD VPR	RCR at CSU (human subjects, animal use, infectious agents, rDNA, lab safety, etc.) and Research Misconduct
Mar 14	Chaoping Chen	WB data acquisition and analyses
Mar 28	Mara Sedlins, PhD – Data Management Specialist, Morgan Library	Data management
April 4	Chaoping Chen	Group discussion on selected topics and cases
Apr 11	Chaoping Chen	Group discussion on selected topics and cases
Apr 18	Chaoping Chen	Group discussion on selected topics and cases; Online RCR training due

Assessment & Grading:

Traditional letter grades will be determined based on attendance, participation, and written assignments:

1) Attendance: Regular attendance is **mandatory**. Excused absence must be approved in advance. Each unexcused absence lowers the final grade by one letter.
2) Participation: Active engagement in group discussions is required.
3) Written Assignments: All homework must be submitted to Canvas on time; delayed submissions are not acceptable.
4) Online Training: Students must complete the required online RCR training via the CITI Program and submit their certificate by Apr 18, 2025.

Academic Integrity

This course adheres to the Academic Integrity Policy of Colorado State University as outlined at http://tilt.colostate.edu/integrity/resourcesStudents/**.** By enrolling, students agree to the Student Honor Pledge:

"I have not given, received, or used any unauthorized assistance."

Academic dishonesty—including cheating, falsification, plagiarism, abuse of academic materials, or complicity—will result in disciplinary action and may lead to a failing grade.

Resources/Background reading:

- *On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. Washington, DC: The National Academies Press. https://doi.org/10.17226/12192.*
- *Responsible Conduct of Biomedical Research: A Handbook for Biomedical Graduate Studies Students.*
- https://oir.nih.gov/sourcebook/ethical-conduct/responsible-conduct-research-training
- https://poynter.indiana.edu/
- Responsible Conduct of Research; Adil E. Shamoo and David B Resnik.
- Research Ethics: A Reader; Deni Elliott and Judy E. Stern, Editors.
- "Truth and Consequences" (Science report on the Goodwin case)
- *The Moral Instinct*, NY Times article by Steven Pinker
- *The Double Blind Gaze by* Steven Bratmann
- *The collaborative Institutional Training Initiative (CITI program)*