

Syllabus: Introduction to Mammalian Cell Culture Nanocourse

Learning objectives: This cell culture nanocourse introduces students to key laboratory techniques used in mammalian cell culture. In this nanocourse, students will learn:

- How to thaw, plate, passage and freeze adherent mammalian cells with an emphasis on aseptic technique,
- Key microscopy techniques used to visualize cells, including phase contrast and fluorescence microscopy,
- How to count cells and assess viability,
- How to transfect and visualize transfected cells,
- How to work safely in a cell culture laboratory.

Pre-requisites: Completion of BIO 605 or permission of the instructor. Enrollment capped at 6 students per biosafety cabinet.

Modality: This nanocourse is a hands-on laboratory experience with supplemental lecture and pre-lab prep (readings and/or videos to help students prepare for the planned lab activities).

Required Biosafety Training: Prior to the start of the course, students will be required to provide documentation of completion of the following CITI laboratory safety trainings: Introduction to Biosafety (61079) and OSHA Bloodborne Pathogens (61084). Note that completion of these trainings is also required for the pre-requisite course BIO 605, so most will have up-to-date records.

Assignments: There are no assignments, however, the instructor may provide pre-lab readings and/or videos to help students prepare for the planned lab activities.

Grading: this nanocourse is graded on a pass/fail basis, with attendance and participation being the key requirements to earn a passing grade.

Meeting times: TBD. The course is designed to run over a 4-5 day timeframe, meeting 3-4 hours per day. Due to the inherent variability in how cells grow, the course may run for either 4 days or 5 days.

Sample schedule: (subject to change)

Day 1: Introduction to aseptic technique and microscopy, thaw cells into T25 flask

Day 2: Split cells for transfection (from T25 into 12 well plate), count cells, perform cell viability assay

Day 3: Mini-prep expression constructs, transfect cells with plasmid containing fluorescent reporter

Day 4: Split and freeze cells, visualize transfected cells

Day 5: Optional return to visualize transfected cells