

Gladstone-CIRM Shared Resources Laboratory

Fundamentals of iPSCs & CRISPR: A Presentation Series

These courses will each be scheduled once every six months. Registration is required, and the registration link will be sent one month before the sessions begin.

Additional one-time courses and seminars will be offered on topics related to iPSC culture, differentiation methods and tools, gene editing, iPSC reprogramming throughout the year.

The courses are free of charge.

If you need any of these courses before the scheduled sessions, please contact us at stemcell-core@gladstone.ucsf.edu and let us know which course you are interested in.

Course 1: Best Practices for iPSC Culture

Duration: 1 hour

Outline:

1. **Introduction to iPSC Culture (10 min)**
 - Overview of iPSCs and their importance
2. **Maintaining Healthy iPSC Cultures (15 min)**
 - Culture media and conditions
 - Identifying and preventing spontaneous differentiation
3. **Passaging and Expansion (15 min)**
 - Single cell vs clump passaging
 - Maintaining colony morphology
4. **Cryopreservation and Thawing (10 min)**
 - Best practices for freezing and thawing and cell banking
 - Ensuring high viability post-thaw
5. **Troubleshooting Common Issues (10 min)**
 - Contamination control, aseptic technique

Course 2: Basics of CRISPR-Cas9 Gene Editing

Duration: 1 hour

Outline:

1. **Introduction to CRISPR-Cas9 (10 min)**
 - Discovery and mechanism
 - Components (Cas9, sgRNA)
2. **Guide RNA Design and Delivery Methods (15 min)**
 - Designing effective sgRNAs
 - Delivery options: plasmid, RNP, viral vectors
3. **CRISPR Editing in iPSCs (15 min)**

- Transfection and selection of edited clones
- Minimizing off-target effects
- 4. **Validation of Gene Edits (10 min)**
 - Genotyping (PCR, sequencing)
 - Functional assays
- 5. **Ethical Considerations and Challenges (10 min)**
 - Regulatory guidelines
 - Potential applications in disease modeling