

Human Stem Cell and Neuronal Differentiation Core (HSCNDC)



ADVANCED
TECHNOLOGY
CORES

Basics of Human Pluripotent Stem Cells A Training Guide

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Location:

Human Stem Cell and Neuronal Differentiation Core (HSCNDC)
Jan and Dun Duncan Neurological Research Institute
1250 Moursund Street,
Class sessions in the 7th floor Small Conference Room N.0700.20
Hands-on sessions in the 9th floor suite N0925.10
Houston, TX 77030

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Human Stem Cell and Neuronal Differentiation Core (HSCNDC)

Overview:

This multi-day basic training class will provide hands-on training in all main aspects of culturing human pluripotent stem cells (hPSCs). You will be provided all needed material during the course which will include the following:

- Lectures, laboratory demonstrations and guided hands-on practice sessions reviewing essential experimental protocols.
- Practical instructions on culturing, cryopreserving, and maintaining hPSCs with emphasis on cell morphology, colony size, and density. Both feeder-dependent and feeder-free culture methods will be addressed.
- Discussion on the importance of frequent monitoring and characterization of hPSCs by karyotyping, stem cell marker expression monitoring, and pluripotency assays.

Class Schedule

DAY 1

Monday

Lab tour

9:30 AM - 10:00 AM

Class: Stem Cell Basics

10:00 AM – 12:30 PM

- Introduction
- Overview of stem cell history and basic concepts
- Induced pluripotent stem cells & reprogramming methods
- Basic hPSC culture methods and cell quality control assays
- Spontaneous and directed differentiation
- Disease modeling

DAY 2

Tuesday

Hands-On Session 1

9:00 AM - 11:30 AM

- Coating plates with Matrigel (demo only) - PROTOCOL #6
- Thawing hPSCs on Matrigel (demo + practice) - PROTOCOL #7
- Transfection of feeder-free hPSCs by Nucleofection (demo only) - PROTOCOL #10
- Passaging feeder-free hPSCs with Accutase (demo + practice) - PROTOCOL #9

DAY 3



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Wednesday

Hands-On Session 2

9:00 AM - 11:30 AM

- Observation hPSCs passaged and transfected during the previous day in Session 1
- Passaging feeder-free hPSCs with ReLeSR (demo + practice) – PROTOCOL #8
- Freezing feeder-free hPSCs (demo + practice) – PROTOCOL #5
- Live iPSC staining with AP green (demo only) – PROTOCOLS #11 & #12
- Colony picking (demo)

Class: Applications and Final Discussion

12:00 PM – 1:00 PM

- Time & costs of iPSC generation
- HSCNDC products & services
- Comprehension questions