

Regeneration Methods for the Visual System- NEI course proposal

Aug 28- Sept 1, 2017

Location: NIH Main Campus (Bldg 60), Bethesda, MD 20892

Aug 28, 2017 Monday

Overview of stem cells & animal models & generation of replacement cells

8:30 am- 9:00 am	Check –In
9:00 am-9:15 am	Welcome Remarks (NEI & FAES staff)
9:15 am-9:45 am	Introduction to mouse pluripotent stem cells -generating ESCs & iPSCs (TBD)
9:45 am-10:15 am	Introduction to human pluripotent stem cells (Jizhong Zou, iPSC Core- NHLBI)
10:15 am- 11:00 am	Basics for visual function experiments in small animals (Haohua Qian, NEI Visual Function Core)
11:00 am-11:15 am	Break
11:15 am-12:15 pm	Transplantation considerations in large animal models of retinal disease: Doug Dean, (University of Louisville)
12:15 am- 1:15pm	Lunch
1:15 – 5 PM:	Hands-on: reprogramming techniques (ThermoFisher)

Aug 29, 2017 Tuesday

Differentiation into retinal neurons

9:00 am-10:45 am	Intro to retinal organoids & stem cell-derived photoreceptors: Anand Swaroop (NEI)
10:45 am-11:00 am	Break
11:00 am-12:15 pm	Cone differentiation from hPSCs and retinal disease: Gilbert Bernier (University of Montreal)
12:15 am-1:15 pm	Lunch
1:15 pm -2:30 pm	Differentiation of iPSC-derived retinal ganglion cells (RGCs) & applications for understanding development and disease: Jason Meyer (Indiana)
2:30 pm-2:45pm	Break

Retinal regeneration animal models & transplantation of retinal neurons

2:45 pm-3:45 pm	Retinal disease & regeneration in mouse models: Valerie Wallace (University of Ottawa)
3:45 pm-4:45 pm	Generation of RPE from iPSC & testing in a pig model for AMD-Kapil Bharti (NEI)
4:45 pm-5:00 pm	Q &A Discussion

Aug 30, 2017 Wednesday

9:30 am -4:30 pm: Lab Rotations (See the schedule below)

Aug 31, 2017 Thursday

9:30 am -4:30pm: Lab Rotations (See the schedule below)

Sept 1, 2017 Friday

Using stem cells in translational research

- 9:00 am- 10:15 am: Morning Panel discussion with instructors (All experts available)
- Using stem cells to model disease and find therapies
 - Disease in a dish (Xitiz Chamling, JHU)
 - Tissue Chip (Kapil Bharti, NEI)
 - 3D Organoids (Jess Mazerik, NEI)
- 10:15 am- 10:30am: Break
- 10:30 am-12:00 pm: Training and fellowship opportunities for trainees (Neeraj Agarwal, Ph.D. Program Officer; Chuck Wright, AAAS fellow experience)
- 1:00 pm- 2:00 pm Afternoon wrap-up discussion and reception
- Course take-aways
 - Course feedback & evaluation /certificates

LAB ROTATION (Aug 30 Wed & Aug 31 Thu)

	Wei Li's Lab: Juan Angueyra, Ph.D. & John Ball, Ph.D. Photoreceptor physiology in a retinal slice Focus: physiology Techniques: Synaptic release assay	Anand Swaroop's Lab: lab staff- Holly Chen, Ph.D. and Charlie Drinnan, Ph.D. Focus: Mouse retinal organoids, Techniques: Analysis of structure & function	Vision function Core Lab- Haohua Qian, Ph.D. & Yichao Li: Electrophysiology techniques & imaging e.g. ERG recording techniques, OCT in mice	Kapil Bharti's Lab: Ruchi Sharma, Ph.D. & Roba Dejene: using pig to assay for integration and function of RPE
Aug 30, 2017 WED 9:30-12:30	Group 1	Group 2	Group 3	Group 4
Aug 30, 2017 WED 1:30-4:30	Group 2	Group 3	Group 4	Group 1
Aug 30, 2017 THU 9:30-12:30	Group 3	Group 4	Group 1	Group 2
Aug 30, 2017 THU 1:30-4:30	Group 4	Group 1	Group 2	Group 3