BioPharmaceutical Technology Center
I N S T I T U T E

Molecular Approaches to Neuroscience
NTP 675
June 20-24, 2022

This course will have four unique components. To successfully complete this course, students will need to submit pre-work assignments in a timely fashion and engage with asynchronous course materials. We will meet face to face the week of June 20-24, 2022 and will make efficient use of our time by completing laboratory activities, including analyses as well as other relevant activities.

The four components of the course are:

1. **Pre-work**–Asynchronous material will be posted to the course Canvas site at least one week prior to June 20. You may watch lectures and complete quizzes, worksheets, and other evaluation materials beginning June 13. Please note that some items will have deadlines associated with the in-person content.
2. **Evaluation** – Evaluation of your engagement and learning will include quizzes, worksheets, data analyses, and in person attendance and contributions to class. As noted above, some items will be bound to deadlines associated with our in-person modules.
3. **In-person** – Several hours per day have been designated for in-person attendance the week of June 20-24, 2022. Please review the schedule and plan to be on the Promega campus during that time.
4. **Office hours/Individual Consultations** – These can be scheduled as needed throughout the week of June 20-24, 2022

Tentative Schedule:

Date	Time	Module	Instructor
Monday, June 20			
Asynchronous Pre-work and Evaluation Materials *Please check Canvas for recordings which must be completed prior to attending in person and evaluation materials, which need to be completed prior to July 1.*			
		Lecture Purifying RNA	Sarah Teter
		Lecture Studying miRNAs	Doug Horejsh
		Lecture PCR Techniques with an emphasis on RT-PCR and qPCR.	Rod Pennington
Additional Assignments:	To complete: Nucleic acid isolation quiz; Basic of Nucleic Acid Purification module; RNA Isolation worksheet; Real Time PCR quiz		
In-Person Schedule			
	9:00a – 9:30a	Welcome and Introductions	Amy Prevost, Erica Golueke
	9:30a – 11:15a	*Laboratory* RNA isolation from brain tissue	Sarah Teter, Amy Prevost

		and spec analysis.	
	11:15a – 12:30p	*Laboratory* Cloning - RT-PCR amplification *Laboratory* RT-qPCR set up	Natalie Betz, Amy Prevost
	12:30p – 1:00p	*Lunch Lecture* Questions about PCR? Places where mistakes often happen…	Rod Pennington
	1:00p – 3:00p	*Laboratory* Transfect CRISPR pools for studying protein degradation. *Lecture* Using Cas-9 to create a double strand break: Now what?! CRISPR design basics.	Erica Golueke, Michael Slater Michael Slater
Tuesday, June 21			
Asynchronous Pre-work and Evaluation Materials *Please check Canvas for recordings which must be completed prior to attending in person and evaluation materials, which need to be completed prior to July 1.*			
Additional Assignments:	To complete: Cloning quiz; Introduction to Gene Editing module		
In-Person Schedule			
	9:00a – 10:30a	*Lecture* Cloning – Tools and Techniques	Jim Hartnett
	10:30a – 11:15a	*Laboratory* Cloning –RT-PCR analysis and ligation reaction *(Instructors will load and run gels for students)*	Natalie Betz, Amy Prevost
	11:15a – 12:30p	*Lunch Lecture* Consequences of double strand breaks: CRISPR conversation continued.	Michael Slater
	12:30p – 1:30p	*Laboratory* Cloning- Transformation	Natalie Betz, Amy Prevost
	1:30p – 2:30p	*Laboratory* Transfer CRISPR pools to 96-well plate.	Erica Golueke, Amy Prevost
	2:30p – 3:00p	*Laboratory* Cloning – plating cells	Amy Prevost

Wednesday, June 22			
Asynchronous Pre-work and Evaluation Materials *Please check Canvas for recordings which must be completed prior to attending in person and evaluation materials, which need to be completed prior to July 1.*			
Additional Assignments:	Complete Introduction to Bioluminescence Module		
In-Person Schedule			
	9:00a – 10:30a	*Lecture* Characterizing Proteins	Mike Rosenblatt
	10:30a – 11:30a	*Lecture* Studying protein degradation	Elizabeth Caine, Celia Bisbach
	11:30a – 12:30p	*Lunch Lecture* Kinase biology and drug discovery	Hicham Zegzouti
	12:30p – 2:00p	*Laboratory* Start kinetic read for PROTACs *Laboratory* Prepare cells for cell health analysis	Erica Golueke
	2:00p- 3:00p	*Lecture* Cells as reagents and understanding cell viability	Terry Riss
Thursday, June 23			
Asynchronous Pre-work and Evaluation Materials *Please check Canvas for recordings which must be completed prior to attending in person and evaluation materials, which need to be completed prior to July 1.*			
		Lecture Western Blot, ICC and ELISA	Chris Eggers
Additional Assignments:			
In-Person Schedule			
	9:00a – 10:00a	*Lecture* Basics of Western Blotting	Chris Eggers
	10:00a – 11:30a	*Laboratory* Western Blot: prepare and run gels; begin transfer	Chad Zimprich, Amy Prevost

	11:30a – 12:15p	*Laboratory* Analysis of RT-qPCR Data Western Blot: Blocking and primary antibody addition	Natalie Betz, Amy Prevost Chad Zimprich, Amy Prevost
	12:15p – 1:30p	*Lunch Discussion* Review basics of studying protein degradation + PROTAC data analysis & remaining question about genome editing	Elizabeth Caine, Celia Bisbach, Michael Slater
	1:30p – 3:00p	*Laboratory* Western Blot: Washes (15 min) & apply secondary antibody (30 min, during which we will switch to…) *Laboratory*: Start Colony PCR *Laboratory* Western Blot: Wash and develop	Chad Zimprich, Amy Prevost Natalie Betz, Amy Prevost Chad Zimprich, Amy Prevost
Friday, June 24			
Asynchronous Pre-work and Evaluation Materials *Please check Canvas for recordings which must be completed prior to attending in person and evaluation materials, which need to be completed prior to July 1.*			
Additional Assignments:	Complete Cell Health Quiz; complete delta-delta Cq analysis worksheet		
In-Person Schedule			
	9:00a – 10:30a	*Lecture* Studying cell death and monitoring cell health; Using NanoLuc to track apoptotic events in cells	Andrew Niles
	10:30a – 1:30p	*Laboratory* Monitoring cell health *(Pizza lunch)* *Laboratory* Gel analysis of colony PCR	Erica Golueke, Andrew Niles Natalie Betz, Amy Prevost
	1:30p- 2:30p	*Guest lecture* Epigenetics and Neurodevelopment	Reid Alisch
	2:30p – 3:00p	*Course Wrap Up*	