



## Emerging Techniques in Protein and Genetic Engineering

Oncology 675-002

July 25-29, 2022

*This course will have four unique components. To successfully complete this course, students will need to submit pre-work assignments and evaluations in a timely fashion and engage with asynchronous course materials. We will meet face to face the week of July 25-29, 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 July 25. You may watch lectures and complete quizzes, worksheets, and other evaluation materials beginning July 18. Please note that some items will have deadlines associated with the in-person content. If you are not taking this course for credit you will not have access to Canvas, so I will create a Box folder to share information with you.
- 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. If you are not taking this course for credit, evaluation materials are optional.
- 3. In-person** – Several hours per day have been designated for in-person attendance the week of July 25-29, 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 July 25-29, 2022; suggested times have been designated on the schedule.

Schedule:

Date	Time	Module	Instructor
<b>Monday, July 25</b>			
<b>Asynchronous Pre-work and Evaluation Materials</b> <i>Please check Canvas for recordings and evaluation materials, which must be completed <b>prior to attending</b> in person on each designated day.</i>			
	<a href="https://canvas.wisc.edu/courses/302596/pages/epigenetics-and-assessing-cell-health">https://canvas.wisc.edu/courses/302596/pages/epigenetics-and-assessing-cell-health</a> (“Cell Health Seminar”)	Lecture Assessing cell health: The cellular consequences of HDAC inhibition	Andrew Niles
	<a href="https://canvas.wisc.edu/courses/302596/pages/genome-editing-and-protein-degradation-analysis">https://canvas.wisc.edu/courses/302596/pages/genome-editing-and-protein-degradation-analysis</a>	Lecture: Studying protein degradation	Elizabeth Caine
<b>Additional Assignments:</b>	TBD		
<b>In-person Schedule</b> <i>These speakers, activities, discussion sessions, laboratory sessions, and data analyses that will take place in the Feynman building on the Promega campus.</i>			

	9:00a – 9:30a	Welcome and Introductions	Amy Prevost, Erica Golueke
	9:30a – 10:30a	<i>Lecture:</i> Using cells as reagents.	Terry Riss
	10:30a – 1:30p	<i>Laboratory:</i> HDAC laboratory – Set up experiments; HDAC selective assays - HDAC2 and HDAC1a, test HDAC inhibitor potencies. <i>Dose cells for cell health assessment.</i>	Andrew Niles, Erica Golueke
	1:30 – 3:00p	<i>Laboratory:</i> Create CRISPR pools for studying protein degradation	Erica Golueke
<b>Asynchronous Pre-work and Evaluation Materials</b>			
<i>Please check Canvas for recordings and evaluation materials, plus additional pre-work which must be completed <b>prior to attending</b> in person on each designated day.</i>			
<b>Tuesday, July 26</b>			
<b>Additional Assignments:</b>			
<b>In-person Schedule</b>			
<i>These speakers, activities, discussion sessions, laboratory sessions, and data analyses that will take place in the Feynman building on the Promega campus.</i>			
	9:00a – 10:30a	<i>Lecture:</i> Epigenetics overview; DNA modifiers, histone protein modifiers and opportunities and approaches for modulating epigenetic targets.	Thomas Kirkland
	10:30a – 11:30a	<i>Lecture:</i> Genome editing: History, ethics, disease modeling and drug discovery. CRISPR/Cas-9 design and implementation.	Michael Slater
	11:30a – 12:30p	<i>Laboratory:</i> Transfer CRISPR pools to 96-well plate.	Erica Golueke, Mike Slater
	12:30p – 2:00p	<i>Lecture:</i> CRISPR/Cas-9 and beyond	Michael Slater
	2:00p – 3:00p	<i>Lecture:</i> ddPCR	Doug White, Caitlin Stallings

<b>Asynchronous Pre-work and Evaluation Materials</b>			
<i>Please check Canvas for recordings and evaluation materials, plus additional pre-work which must be completed <b>prior to attending</b> in person on each designated day.</i>			
<b>Wednesday, July 27</b>			
	<a href="https://canvas.wisc.edu/courses/302596/pages/epigenetics-and-assessing-cell-health">https://canvas.wisc.edu/courses/302596/pages/epigenetics-and-assessing-cell-health</a>	<i>Lecture:</i> HDAC biology, isoenzymes and methods for measuring activity	Thomas Kirkland
<b>Additional Assignments:</b>			
<b>In-person Schedule</b>			
<i>These speakers, activities, discussion sessions, laboratory sessions, and data analyses that will take place in the Feynman building on the Promega campus.</i>			
	9:00a – 10:00a	<i>Lecture:</i> Studying protein degradation	Elizabeth Caine
	10:00a – 10:30a	<i>Laboratory:</i> CRISPR lab - add Endurazine compound (2.5-hour incubation)	Erica Golueke
	10:30a – 1:00p	<i>Laboratory:</i> Cell health assessment	Andrew Niles, Erica Golueke
	1:00p -1:30p	<i>Laboratory:</i> PROTAC serial dilution, add to plate and start kinetic read for PROTACs during incubation	Erica Golueke
	1:30p – 3:00p	<i>Discussion:</i> Cell health data discussion	Andrew Niles, Erica Golueke
<b>Asynchronous Pre-work and Evaluation Materials</b>			
<i>Please check Canvas for recordings and evaluation materials, plus additional pre-work which must be completed <b>prior to attending</b> in person on each designated day.</i>			
<b>Thursday, July 28</b>			
	<a href="https://canvas.wisc.edu/courses/302596/pages/guest-lectures">https://canvas.wisc.edu/courses/302596/pages/guest-lectures</a>	<i>Lecture:</i> MSI screening for cancer and prognostic use.	Jeff Bacher
<b>Additional Assignments:</b>			
<b>In-person Schedule</b>			
<i>These speakers, activities, discussion sessions, laboratory sessions, and data analyses that will take place in the Feynman building on the Promega campus.</i>			
	9:00a – 10:00a	<i>Lecture/Review: PROTACs for Drug Discovery</i>	Elizabeth Caine

		<i>Discussion: PROTAC data analysis</i>	
	10:00a – 11:00a	<i>Lecture: Immunoaffinity and bead-based capture of proteins.</i>	Richard Burgess
	11:00a – 2:00p	Lecture and Laboratory Demonstration: Next Gen Sequencing using iSeq	Jeff Olsen, Illumina
	2:00p – 3:00p	Lecture: IP and Patent Law	David Casimir, Casimir & Jones, LLC
<b>Asynchronous Pre-work and Evaluation Materials</b>			
<i>Please check Canvas for recordings and evaluation materials, plus additional pre-work which must be completed <b>prior to attending</b> in person on each designated day.</i>			
<b>Friday, July 29</b>			
<b>Additional Assignments:</b>			
<b>In-person Schedule</b>			
<i>These speakers, activities, discussion sessions, laboratory sessions, and data analyses that will take place in the Feynman building on the Promega campus.</i>			
	9:00a – 10:15a	<i>Data Review</i> NGS data analysis session; walk to BTC	Jeff Olsen
	10:15a – 11:15a	<i>Lecture:</i> Mass spectrometry for characterizing biologics.	Chris Hosfield
	11:15a – 12:30p	<i>Lecture:</i> Antibodies for immunotherapy, ADCC reporter assays for testing biologics.	Jamison Grailer
	12:30p – 1:00p	Lunch	
	1:00p – 2:30p	<i>Lecture:</i> Detecting post translational modifications	Hicham Zegzouti
	2:30p – 3:00p	<i>Final Questions and Closing Remarks</i>	Amy Prevost, Erica Golueke