

MMG1317H - Special Topics in Advanced Cancer Proteomics

Course Organizer: Michael Moran

Instructors: Michael Moran, Hannes Röst, Brian Raught, Thomas Kislinger, Igor Stagljar

Dates: Tentative: Wed 09 Nov 2022 – Wed 14 Dec 2022 [6 weeks]

Time: Tentative: 10 AM – Noon

Place: Peter Gilgan Centre for Research and Learning (room to be determined)

Enrollment: TBD approx. Max enrollment ~15 students

Synopsis:

The premise of the course is that cancer is largely a product of the sequence-to-phenotype continuum: DNA-to-RNA-to-Proteome-to-Phenotype (i.e. cancer). The course comprises a series of lectures delivered by leading proteomics experts and researchers. Students will learn about mass spectrometry-based proteomics including spectral analysis, and tissue proteome profiling as methods to discover cancer drivers and biomarkers, and to define and compare phenotypes such as normal versus cancer; drug responsive versus drug resistant. Innovative high-content proteomics technologies will be introduced that have been developed and applied to systematically interrogate proteomes for protein interactions associated with disease, cell regulation, and drug responsiveness.

Syllabus:

Week 1. Cancer proteome profiling (Michael Moran)

Week 2. Cancer Biomarker Discovery (Thomas Kislinger)

Week 3. Mapping Protein Interactions and Organization by Proximity Ligation (Brian Raught)

Week 4. Data Independent Analysis (Hannes Röst)

Week 5. Proteomics Approaches for Cancer Drug Discovery (Igor Stagljar)

Week 6. Review and Final Exam (Michael Moran)

In weeks 2 – 5, students will give a 15-minute presentation following the guest lecture. The focus and outline of this presentation will be discussed during the first class. Each student will be assigned a key paper in the field and present this paper as a journal club. All students will receive the reading list during the first week and will be expected to participate in the journal club discussion.

60-mark/60-min Written Examination

Course Evaluation:

Class participation – 20%

Class presentation – 30%

Final Exam – 50%