CHM 1107 Winter/Spring 2020
The –Omics Revolution and Mass Spectrometry

Biology is in the midst of a 'systems' revolution, which emphasizes the evaluation of interactions between hundreds-thousands of biomolecules in parallel. This paradigm, which has spawned the ever-growing number of '–Omics' disciplines, has been driven in part by tools developed by analytical chemists (e.g., microfluidics, multiplexed separations, high resolution spectroscopy). One analytical technique that has had a particularly important role in the revolution is mass spectrometry. In CHM 1107, we take a detailed look at mass spectrometry and associated methods, and survey the state-of-the-art in other analytical tools that are driving the -Omics revolution.

Instructor
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Couse Schedule
Please consult the schedule posted on the course website. Regular course meetings will be on *Thursdays 3:10 - 5:00 pm in SS1080*, beginning Jan. 9. I anticipate that the final day of class will be April 9.

The course schedule is subject to change depending on enrollment. Additional sessions (likely on Monday or Tuesday evenings, 6-8 pm) will be scheduled to accommodate student presentations if class enrolment is > 12. The April 9 session will be cancelled if enrolment is < 9.

Course Structure
The course will be a mixture of instructor and student presentations and discussions. Discussions will be centered on recent and seminal research papers in the literature. Each student will make two presentations: one as part of a group near the beginning of the course and an individual "journal club" presentation near the end of the course. Active participation in the course is expected from all students (see below).

Website
All relevant course information will be posted on the course website available through Quercus: https://q.utoronto.ca

Marking Scheme
The marks breakdown is shown in the table below.

Participation	20%
Group Presentation	30%
Journal Club Lecture	50%

Note that 20% of the course mark will be assigned for participation. Participation includes contribution to discussions; asking or answering questions and making comments after presentations.

Group Presentations
Groups (mostly of three, but group sizes may be adjusted for enrollment) will present on current topics important in mass spectrometry. On the first day of class, students will select from a posted set of topics. The number of available topics will depend on course enrollment. Likely topics are alternative ionization techniques for MS; alternative dissociation techniques for MS; ultrahigh resolving power mass spectrometers; ancillary techniques for MS: ion mobility mass spectrometry; labeling strategies. Presentations should be ~50 minutes (+ ~5 minutes for questions) for the groups with three members and ~35 minutes (+ question time) for any groups with two members. More information about this assignment is posted on the course website.

Journal Club Assignment
Every student taking CHM 1107 is responsible for giving a 28+5 minute "journal club"-style presentation. In this lecture, you should describe, explain, and critically evaluate a peer-reviewed paper of your choosing. The paper should (a) be a primary source (i.e., no reviews), (b) should be recent (i.e., 2013 or later), and (c) should be focused on either –Omics or technological or methodological developments in mass spectrometry, or both. More information about this assignment is posted on the course website.