

Radiochemistry for the Life Sciences
Chemistry 536
Spring 2011
Monday and Wednesday, 2:30-4 pm
Location – Laboratory Sciences Building 201

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Radiochemistry for the Life Sciences is intended to act as an introduction to radiochemistry. It will cover production, instrumentation, and radiochemistry techniques to make use of radiotracers in the life sciences from basic biological and environmental applications to medical imaging and therapy. The course will include lectures on the radioactive decay, detection methods and will have lectures dedicated to chemistries of specific radioisotopes of importance in the life sciences.

January 19 (Wed):	Introduction to Radioactivity, History (Suzanne Lapi/Michael Welch)
January 24 (Mon):	Nuclear Stability, Mass Excess and the Chart of the Nuclides (Suzanne Lapi)
January 26 (Wed):	Modes of Radioactive Decay (Suzanne Lapi)
January 31 (Mon):	Nuclear Structure (Lee Sobotka)
February 2 (Wed):	Interactions of Radiation with Matter, Detectors (Yuan-Chuan Tai)
February 7 (Mon):	Scanners and Imaging (Yuan-Chuan Tai)
February 9 (Wed):	Health Effects of Radiation (Buck Rogers)
February 14 (Mon):	Nuclear Reactions (Suzanne Lapi)
February 16 (Wed):	Radiochemistry Techniques and Equipment (Carolyn Anderson)
February 21 (Mon):	no lecture
February 23 (Wed):	Production of Radionuclides, Accelerators (Suzanne Lapi)
February 28 (Mon):	Chemistry of ^3H (John Katzenellenbogen)
March 2 (Wed):	Chemistry of ^{14}C (John Katzenellenbogen)
March 7 (Mon):	Production of Radionuclides, Reactors (Suzanne Lapi)
March 9 (Wed):	Mid-term Exam (Covers Lectures up to February 28th)
March 21 (Mon):	Chemistry of radioiodine (Carolyn Anderson)
March 23 (Wed):	Chemistry of radiobromine and radioastatine (Suzanne Lapi)
March 28 (Mon):	Chemistry of ^{18}F (Jon McConathy)
March 30 (Wed):	Chemistry of radiocopper (Carolyn Anderson)
April 4 (Mon):	Chemistry of $^{99\text{m}}\text{Tc}$ (Buck Rogers)
April 6 (Wed):	Chemistry of other radiometals (Carolyn Anderson)
April 11 (Mon):	Chemistry of ^{11}C (Jon McConathy)

April 13 (Wed): Applications – Environmental (Suzanne Lapi)
April 18 (Mon): Applications – Medical Imaging (Jon McConathy)
April 20 (Wed): Applications – Medical Therapy (Suzanne Lapi)
April 25 (Mon): Applications – Nuclear Forensics (Suzanne Lapi)
April 27 (Wed): Review for Final

Grading:

Journal Article Reviews (5) – 20%
Mid-Term Exam – 40%
Final Exam – 40%

Exams are in class and closed notes and reading materials.

Lecture Materials:

The lecture notes will be made available online on Telesis (<https://telesis.wustl.edu/>), *ca.* 1 h before the lecture. Copies will be made available at the lecture. Supplemental reading material will also be made available on Telesis.

Moodle

Lectures are being videotaped and will be available on Moodle in case you are not able to make it to the lecture. Moodle is a web-based resource for conducting online educational activities. Moodle uses any familiar Internet browser interface to access a series of Internet pages and associated links, including lecture notes and class materials, the ability to view tutorials, perform self-assessments, and complete supplementary online exercises. Audio, video, and images are features that can, and will, be employed in this course.