

ADVANCED TOPIC COURSE BIO5318

DNA Repair

Description: This course is an advanced graduate course that explores all aspects of DNA damage and the cellular responses to DNA damage. It is designed for graduate students who have a working knowledge of Chemistry, Molecular Biology and Cellular Biology, and for interested postdocs and researchers. The course consists of a lecture module, open to all, and a discussion module for registered students. In addition, several invited scientists in the field of DNA repair will give seminars and meet with registered students for discussion.

Students will present and discuss research papers. Grades will be given based on student presentation and participation.

Credits: 2 units. Letter Grade, Pass/Fail, or Audit.

Coursemaster: Peter Burgers

Prerequisite: Permission of Coursemaster

Time: Wednesdays 2-3:45, starting Jan 24, 2007-through April 18. One hour lecture, followed by 45 min. discussion session for students. Occasional seminars on Wednesday, 4 pm, followed by discussions with seminar speaker, if time permits.

Location: Biochemistry Library, 264 McDonnell

Lecturers: John-Stephen Taylor, Tom Ellenberger, Simon Powell, Peter Burgers

Textbook: Friedberg, E. C., Walker, G. C., Siede, W., Wood, R. D., Schultz, R. A., and Ellenberger, T. (2006). DNA Repair and Mutagenesis (Washington, DC, ASM Press).

Session 1 (Burgers): 24 January: Overview of DNA repair pathways; DNA damage response; epistasis analysis.

Session 2 (Taylor): 31 January: ss and ds DNA stability, DNA breaks, DNA damage chemistry; Xenobiotics, Oxidative damage.

Session 3 (Taylor): 7 February: DNA photochemistry, Photoreactivation

Session 4 (Taylor): 14 February: DNA polymerases, fidelity, and nucleotide insertion opposite damage.

Session 5 (Burgers): 21 February: Mismatch repair; Damage reversal chemistry.

Session 6 (Burgers): 28 February: Postreplication repair, fork regression and restart

Session 7 (Powell) : 7 March: Recombinational DNA repair

Session 8 (Powell): 14 March: Double strand break repair, NHEJ

Session 9 (Powell): 21 March: Cell cycle control of DNA repair; checkpoint, p53

Session 10 (Ellenberger): 28 March: Base excision repair

Session 11 (Ellenberger): 4 April: Nucleotide excision repair, UvrABC

Session 12 (Ellenberger): 11 April: Nucleotide excision repair, Xeroderma, transcriptional coupling, Crosslink repair

Session 13 (Burgers): 18 April: Damage induced and programmed mutagenesis, immune system.