

MIC276: Advanced concepts in DNA metabolism

CRN44293

Winter Quarter 2016

3 Units, 2 x 1.5 hr

Days and times: WF 1:10-2:30 PM
M 10-12 will be used in case of scheduling conflicts and absences

Location: SLB 2064

Instructors: Wolf-Dietrich Heyer, 3165 LS, Tel. 752-3001, wdheyer@ucdavis.edu (in charge)
Neil Hunter, 347C Briggs, Tel. 754-4401, nhunter@ucdavis.edu
Stephen Kowalczykowski, 310 Briggs, Tel. 752-5938,
sckowalczykowski@ucdavis.edu

Office hours: By appointment only

Requirement: It is recommended that students have taken MCB214/BCB214 or an equivalent course. Please check in with Dr. Heyer.

Examinations and grading: The final grade will be determined by equal weight from presentations and writing assignments.

Please note: The mode of grading (letter grade) is other than that listed in the General Catalog (S/U). Each student has the option of reinstating the original grading mode in the following way. By the usual S/U deadline (the 25th day of instruction) the student must take a copy of this syllabus to the Office of the Registrar and file a 'Grading Variance Exception' petition there.

Course website: SmartSite

Notes to students:

Much of the course will be based on the following book:

DNA Recombination, Edited by Stephen Kowalczykowski, Neil Hunter, Wolf-Dietrich Heyer, Cold Spring Harbor Laboratory Press, 2016.

All chapters are available *via* PubMed free of charge if accessed from a UC Davis IP address.

Event announcements

Feb. 12-13, 2016

All students are invited to and expected to attend the following event:

Mechanisms of Genome Maintenance: An international symposium to honor the seminal contributions of Dr. Stephen Kowalczykowski; Feb. 12-13, 2016 AGR Room, Buehler Alumni Center, UC Davis.

March 2, 2016

Research Seminar Dr. Martin Kupiec, Life Sciences 1022, 4:10 pm

Lecture schedule

1. Neil Hunter

Dates: 1/6/2016 - 1/22/2016

Topic: Meiosis and meiotic recombination

- 1/6 Lecture #1: Overview and the logic of meiosis
- 1/8 Lecture #2: Mechanism of meiotic recombination
- 1/13 Lecture #3: Regulation of meiotic recombination, part I
- 1/15 Lecture #4: Regulation of meiotic recombination, part II
- 1/20 Lecture #5: Student Presentations
- 1/22 Lecture #6: Student Presentations

2. Stephen Kowalczykowski

Dates: 1/27/2016 – 2/17/2016

Topic: Mechanisms of recombination

- 1/27 Lecture #7: Models of recombination and overview
- 1/29 Lecture #8: Initiation: resection of DNA ends
- 2/3 Lecture #9: DNA pairing by RecA and Rad51 proteins
- 2/5 Lecture #10: Mediators of DNA pairing
- 2/10 Lecture #11: Regulation of homologous pairing
- 2/12 Symposium: Mechanisms of Genome Maintenance
- 2/13 Symposium: Mechanisms of Genome Maintenance
- 2/17 Lecture #12: Resolution vs. Dissolution

3. Wolf-Dietrich Heyer

Dates: 2/19/2016 - 3/11/2016

Topic: DNA Damage Response and regulation of recombination

- 2/19 Lecture #13: Discovery and definition of checkpoints
- 2/24 Lecture #14: Components of DNA damage response signaling from yeasts to mammals
- 2/26 Lecture #15: Mechanisms of DNA damage response signaling
- 3/2 Lecture #16: Guest Lecture Dr. Martin Kupiec and discussion
- 3/4 Lecture #17: DNA damage response and DNA replication/transcription: Student presentation(s)
- 3/9 Lecture #18: DNA damage response and cell biology/chromatin: Student presentation(s)
- 3/11 Lecture #19: DNA damage response and human health: Student presentation(s)