

## **Spring Quarter**

### **MCB 542 “Nucleic Acids and Enzymes”**

**Tuesdays and Thursdays, FHCRC A3M-025 1:00 p.m. to 3:00 p.m.**

**3 Credits**

**Prerequisites: None**

**Instructors: Barry Stoddard and guests**

This elective will cover the biology, evolution, mechanisms and structure/function relationships of enzymes that act on DNA and RNA. The course will focus both on various molecular systems, and also on important techniques used for their study, including high resolution structure determination, single molecule methods, kinetics and thermodynamic binding analyses, and protein engineering. Each week, one system will be discussed in detail, focusing on an overview and discussion of methodology on Tuesday, and discussion of a corresponding research study from the primary literature on Thursday.

Students will be graded on a combination of presentation and organization of an assigned paper from the primary literature, and a written fellowship-style proposal at the end of the quarter.

#### **Topics:**

Week 1	Methods and the basics of phosphoester bond transfer reactions
Week 2	DNA polymerization
Week 3	DNA ligases
Week 4	Topoisomerases
Week 5	DNA recombination and integration
Week 6	Restriction endonucleases
Week 7	Homing endonucleases
Week 8	Exonucleases and non-specific nucleases
Week 9	Repair, modification and base flipping I
Week 10	Repair, modification and base flipping II