

**Fall Semester, 2018: 9:00 – 10:00AM Mondays
9:00 – 11:00AM Fridays**

WEEK	LECTURE TOPIC	INSTRUCTOR
November 5 & 9	DNA Repair in the Context of Chromatin	David G. Johnson
November 12 & 16	Nucleotide Excision Repair and Human Disease	Richard Wood
November 19 & 23	Thanksgiving Holiday	No Class
November 26 & 30	Meiosis and Homologous Recombination	Francesca Cole
December 3 & 7	Antibody Generation as a Model for DNA Repair	Kevin McBride
December 10 & 14	Targeting DNA Repair for Cancer Therapeutics	Margarida Santos

DNA Repair in the Context of Chromatin

Example papers:

Alatwi HE, Downs JA. Removal of H2A.Z by INO80 promotes homologous recombination. *EMBO Rep.* 2015;16(8):986-94. doi: 10.15252/embr.201540330. PubMed PMID: 26142279; PMCID: PMC4552491.

Ayrapetov MK, Gursoy-Yuzugullu O, Xu C, Xu Y, Price BD. DNA double-strand breaks promote methylation of histone H3 on lysine 9 and transient formation of repressive chromatin. *Proc Natl Acad Sci U S A.* 2014;111(25):9169-74. doi: 10.1073/pnas.1403565111. PubMed PMID: 24927542; PMCID: PMC4078803.

Goldstein M, Derheimer FA, Tait-Mulder J, Kastan MB. Nucleolin mediates nucleosome disruption critical for DNA double-strand break repair. *Proc Natl Acad Sci U S A.* 2013;110(42):16874-9. Epub 2013/10/02. doi: 10.1073/pnas.1306160110. PubMed PMID: 24082117; PMCID: 3801049.

Nucleotide Excision Repair and Human Disease

Example papers:

Vermeij WP, Dolle ME, Reiling E, Jaarsma D, Payan-Gomez C, Bombardieri CR, et al. Restricted diet delays accelerated ageing and genomic stress in DNA-repair-deficient mice. *Nature.* 2016;537(7620):427-31. Epub 2016/08/25. doi: 10.1038/nature19329. PubMed PMID: 27556946;

Vermeulen W, Rademakers S, Jaspers NG, Appeldoorn E, Raams A, Klein B, et al. A temperature-sensitive disorder in basal transcription and DNA repair in humans. *Nat Genet.* 2001;27(3):299-303. doi: 10.1038/85864. PubMed PMID: 11242112.

Cleaver JE. Defective repair replication of DNA in xeroderma pigmentosum. *Nature.* 1968;218(none):652-6. PMID 5655953

Wood RD. In retrospect: A catalyst for 50 years of cancer research. *Nature*. 2018;557, 648-649. doi: 10.1038/d41586-018-05255-1. PMID: 29844546

Meiosis and Homologous Recombination

Example papers:

Arter, M et al. Regulated Crossing-Over Requires Inactivation of Yen1/GEN1 Resolvase during Meiotic Prophase I. *Developmental Cell* 2018, 45:785-800.

Woglar, A and Villeneuve A. Dynamic Architecture of DNA Repair Complexes and the Synaptonemal Complex at Sites of Meiotic Recombination. *Cell* 2018, 173:1678-1691.

Marsolier-Kergoat, M.-C et al. Mechanistic View and Genetic Control of DNA Recombination during Meiosis. *Molecular Cell* 2018, 70:9-20.

Antibody Generation as a Model for DNA Repair

Example papers:

Chromosomal Loop Domains Direct the Recombination of Antigen Receptor Genes. Hu J, Zhang Y, Zhao L, Frock RL, Du Z, Meyers RM, Meng FL, Schatz DG, Alt FW. *Cell*. 2015 Nov 5;163(4):947-59.

The H2B deubiquitinase Usp22 promotes antibody class switch recombination by facilitating non-homologous **end joining**.

Li C, Irrazabal T, So CC, Berru M, Du L, Lam E, Ling AK, Gommerman JL, Pan-Hammarström Q, Martin A.

Targeting DNA Repair for Cancer Therapeutics

Example papers:

Specific Killing of BRCA2-deficient tumors with inhibitors of poly (ADP-ribose) polymerase. Bryant *et al.*, *Nature* 2005, 434: 913-917

Targeting the DNA repair defect in BRCA mutant cells as a therapeutic strategy. Farmer *et al*, *Nature* 2005, 434: 917-920

Mismatch repair deficiency predicts response of solid tumors to PD-1 blockade. Le *et al.*, *Science* 2017, 357 (6349), 409-413.