

**Fall Semester, 2018: 1:00- 4:00 Fridays**

<b>WEEK</b>	<b>LECTURE TOPIC</b>	<b>INSTRUCTOR</b>
October 5	<b>1. Gene expression analysis</b>	Bin Liu
October 12	<b>2. Gene inactivation screening</b>	Han Xu
October 19	<b>3. Cancer Genomics</b>	Rick Wood
October 26	<b>4. Proteomics</b>	Rick Wood & Han Xu
October Nov 2	<b>5. Metabolomics and the microbiome</b>	Bin Liu & JJ Shen

**1. Gene Expression Analysis** (RNA seq, clustering and related techniques)

*Example paper:*

Trapnell C et al. Differential gene and transcript expression analysis of RNA-seq experiments with TopHat and Cufflinks Nat Protoc. 2012 Mar 1;7(3):562-78.

**2. Cancer Genomics** (TCGA data access and analysis)

*Example paper:*

Knijnenburg TA, Wang L, Zimmermann MT, Chambwe N, Gao GF, Cherniack AD, Fan H, Shen H, Way GP, Greene CS, Liu Y, Akbani R, Feng B, Donehower LA, Miller C, Shen Y, Karimi M, Chen H, Kim P, Jia P et al. (2018) Genomic and Molecular Landscape of DNA Damage Repair Deficiency across The Cancer Genome Atlas. *Cell Rep* **23**: 239-254 e6

**3. Gene inactivation screening** (CRISPR libraries, RNAi)

*Example paper:*

Rosenbluh J\*, Xu H\*, Harrington W, Gill S, Wang X, Vazquez F, Root DE, Tsherniak A, Hahn WC. Complementary information derived from CRISPR Cas9 mediated gene deletion and suppression. *Nat Commun* **8**:15403, 2017.

**4. Proteomics** (Protein identification, genome-wide protein interactions)

*Example paper:*

Gupta R, Somyajit K, Narita T, Maskey E, Stanlie A, Kremer M, Typas D, Lammers M, Mailand N, Nussenzweig A, Lukas J, Choudhary C (2018) DNA Repair Network Analysis Reveals Shieldin as a Key Regulator of NHEJ and PARP Inhibitor Sensitivity. *Cell* **173**: 972-988.e23

**5. Metabolomics and the microbiome** (microbiome influence on disease outcome)

*Example paper:*

Ayelet Sivan et al (2016) Commensal *Bifidobacterium* promotes antitumor immunity and facilitates anti-PD-L1 efficacy Science. 2015 Nov 27;350(6264):1084-9