

## **22. Oncogenes** **2 units Asmin Tulpule – March 6 and 6, 2026**

### **March 5, 2026**

1. How do you define an oncogene? Definitions and oncogenesis assays 101.
2. The origins: Viral oncogenes and RAS
3. Mechanisms of generating oncogenes: Mutation, Chromosomal translocations, Overexpression
4. Classes of oncogenes (Growth factor receptors, signal transducers, transcription factors, apoptosis)
5. Defining oncogenes in the genomic age
6. Targeting oncogenes (Direct inhibitors vs. Oncogene-induced dependencies)
7. Examples of oncogene-induced dependencies
  - RAS farnesylation
  - PARP inhibitors in BRCA mutant cancers
  - Examples from Tulpule Lab (RTK granules, FET proteins and DNA repair)
8. Addressing the Reproducibility Crisis

### **March 6, 2026**

#### **Papers for discussion:**

Girish V, Lakhani AA, Thompson SL, Scaduto CM, Brown LM, Hagenson RA, Sausville EL, Mendelson BE, Kandikuppa PK, Lukow DA, Yuan ML, Stevens EC, Lee SN, Schukken KM, Akalu SM, Vasudevan A, Zou C, Salowska B, Li W, Smith JC, Taylor AM, Martienssen RA, Liu Y, Sun R, Sheltzer JM. Oncogene-like addiction to aneuploidy in human cancers. *Science*. 2023 Aug 25;381(6660):eadg4521. doi: 10.1126/science.adg4521. Epub 2023 Aug 25. PMID: 37410869; PMCID: PMC10753973.