

## 25. Eukaryotic chromosome replication

1 unit, Dirk Remus, October 2 and October 3, 2025

- **Initiation**
  - The scale of DNA replication
  - Initiation of bidirectional DNA synthesis at replication origins
  - Cell cycle regulation of origin firing
  - Mechanism of MCM loading at replication origins
- **Elongation**
  - Mechanism of CMG assembly and activation
  - Components and structure of the eukaryotic replisome
  - Mechanism of fork progression
  - Replication-coupled processes
  - Replication stress
- **Termination**
  - Fork convergence
  - Mechanism of CMG disassembly
  - The end replication problem: Telomere replication
- **Replication stress: Dealing with obstacles**
  - Forms of replication stress

### Review Papers:

Costa A, Diffley JFX. **The Initiation of Eukaryotic DNA Replication.** *Annu Rev Biochem*, 2022; 91:107-131. PMID 35320688.

Saxena S, Zou I. **Hallmarks of DNA replication stress.** *Mol Cell*, 2022; 82(12):2298-2314. PMID 35714587.

### Discussion paper:

#### October 3, 2025:

Sparks JL et al. **The CMG Helicase Bypasses DNA-Protein Cross-Links to Facilitate Their Repair.** *Cell*. 2019. PMID 30595447.