Stem Cells and Differentiation

Stem Cell Types

- Totipotent: can form organism
- Pluripotent: all cell types
- Multipotent: limited lineages
- Unipotent: single cell type

Differentiation Signals

- Growth factors
- Cell-cell interactions
- Extracellular matrix
- Mechanical cues

Epigenetic Changes

- Progressive restriction
- DNA methylation patterns
- Chromatin remodeling
- Transcription factor networks

Regenerative Medicine

- iPSCs: induced pluripotent
- Tissue engineering
- Disease modeling
- Drug screening