

Source: [KBiologyMasterIndex](#)

1 | Mutation and Inheritance

1.1 | Cell Division, Cell Cycle & It's Regulation

Each cell lives and reproduced on a cycle; unsurprisingly, this is called the [KBhBIO101CellLifecycle](#)!

- These cell cycles create [KBhBIO101GeneticVariation](#), even in [KBhBIO101Mitosis](#), because yes!, in mitosis, there could be [KBhBIO101Mutations](#) which introduce variation
- However [KBhBIO101Mutations](#) could cause cancer if left unchecked, so we have [KBhBIO101CellCycleRegulation](#) to keep this cycle check.

At the end of the cell cycle, a little bit of a thing happens where the cell replicates (or makes offsprings, so not necessarily exact copies of) itself. This bit of a thing's called [KBhBIO101CellReproduction](#).

- This reproduction process uses one of either [KBhBIO101Mitosis](#) (exact copy, for somatic cells (not sperm/egg) only) or
- [KBhBIO101Meiosis](#) (half, randomly-mixed genetic info, for gametes (sperm/egg) only).
- The organization of the human genome:
 - The idea that genes and regulatory sequences are located on chromosomes
 - The concept of alleles: what they are, their relation to genes and traits
- The types of reproduction and how they relate to genetic variation. Asexual vs sexual reproduction
 - Mechanisms for genetic variation in offspring as compared to asexual reproduction
- Genetics and inheritance
 - Connecting sequence variation at the DNA level to protein function
 - Connecting protein function to expressed traits in organisms
 - Given an individual with two particular alleles of a gene, what trait would you expect to see.
 - Connecting protein function and traits to inheritance patterns:
 - Given parents with particular alleles of genes, what would you expect in their offspring and why.