

Chapter 10: The Cell Cycle and Cancer

Cells are small due to limits to cell growth. Limits to cell growth include _____, _____, and _____. Once a cell reaches a limit, it must go through a process called _____, which is a part of the cell cycle, to increase _____ and decrease volume. The _____ determines the ability of the cell to control demands on its DNA, use food and oxygen, and move enough material across its cell membrane.

Prokaryotic cells have a relatively simple cell cycle where the DNA is duplicated and the contents of the cell are divided. Eukaryotic cells have two main stages of their cell cycle, called _____ and _____. During _____, the cell grows in size, replicates DNA, and prepares to divide. The cell spends approximately 90% of its time in _____. Sometimes, the cell enters G₀ phase and does not divide during its life. During _____, the cell duplicates. The nucleus duplicates itself during _____ and the cell will divide into two cells if _____ takes place.

Mitosis consists of _____ phases, _____, _____, _____, and _____. You can remember the order of phases with the mnemonic (aids memory) device PMAT. During _____, the chromatin condenses into chromosomes, the centrioles separate, and the nuclear envelope disappears. During _____, the chromosomes line up across the center of the cell, attached to the spindle at their _____. During _____, the _____ separate into individual chromosomes and are pulled apart. During _____, the chromosomes gather at opposite ends of the cell and lose their distinct shapes, while two new nuclear envelopes will form. During _____, plant cells will form a structure known as a _____ and animal cells will pinch at the middle, forming a _____. The number of chromosomes in each cell will be _____ as the original cell.

Under normal circumstances, the cell cycle is controlled by _____ and _____ regulators. _____ regulators include several regulatory proteins. _____ regulators include growth factors and molecules found on the surface of neighboring cells. If the cells in a tissue are separated from neighboring cells by a paper cut, the cells on the edge will _____. Damaged or defective genes can cause the cell to ignore these controls and divide uncontrollably, forming _____. A commonly defective gene is _____, which normally halts the cell cycle until all genes are properly replicated. _____ normally do not affect normal function of surrounding tissues. _____ can invade normal tissues. _____ is a disorder where the cell loses its ability to control cell division and the cells form masses that invade and damage normal tissues.