Regulating The Cell Cycle

Cell Division Review

- During the cell cycle:
  - A cell grows
  - prepares for division
  - Divides to form 2 daughter cells, each of which begins the cycle again

The Cell Cycle consists of 4 Phases

- G_1 (First Gap Phase) - Cells can also stop dividing at this phase & enter the G_0
  - When the cell enters these stages receives signals from it's surroundings, it passes through the restriction point (R) = point of no return = must go through the full cycle
- S Phase
- G_2 (Second Gap Phase)
- M Phase

Controls on Cell Division

- Experiments show that normal cells will reproduce until they come into contact with other cells
- When cells come into contact with other cells they respond by not growing
- This demonstrates that controls on cell growth & division can be turned on & off

How Is The Cell Cycle Regulated?

- The cell cycle is regulated by a specific protein
- The amount of this protein in the cell rises & falls in time with the cell cycle
- Scientists called this protein cyclin because it seemed to regulate the cell cycle
- Cyclings regulate the timing of the cell cycle in eukaryotic cells

Internal Regulators

- Proteins that respond to events inside the cell are called internal regulators
- Internal regulators allow the cell cycle to proceed only when certain processes have happened inside the cell

External Regulators

- Proteins that respond to events outside of the cell are called external regulators
- External regulators direct cells to speed up or slow down the cell cycle

Uncontrolled Cell Growth

- Cancer is a disorder in which some of the body's own cells lose the ability to control growth

How Are Cancer Cells Different From Other Cells?

- Cancer cells don't respond to the signals that regulate the growth of most cells
- Cancer cells divide uncontrollably & form masses of cells called tumors that can damage the surrounding tissues
- Cancer cells may break loose from tumors & spread throughout the body, disrupting normal activities & causing serious medical problems or even death