

5.3

Power Notes

Internal factors: often triggered by external factors; include kinases and cyclins; kinases change the activity of other molecules by adding a phosphate group; cyclins are rapidly made and destroyed at various times during the cell cycle

External factors: include cell to cell contact and other physical signals; also include chemical signals such as growth factors; growth factors may stimulate growth in a wide variety of cells or may stimulate specific cells to divide.

Cell Cycle

Carcinogens: substances that produce or promote the development of cancer

- **Examples:** tobacco smoke, air pollutants, radiation, and even some mutated genes carried by viruses

Cancer Cells: characterized by uncontrolled cell division; continue to grow despite cell to cell contact or due to lack of response to growth factors or no growth factors being present at all.

may form

Tumors: disorganized clumps of cancer cells that do not carry out specialized functions needed by the body.

Malignant: cells break away and form new tumors by way of metastasis or entering the blood stream.

Benign: cells remain encapsulated or clustered together in one area.

may be killed by

Apoptosis: programmed cell death; plays a role in normal development and ridding the body of unhealthy cells.

Examples of apoptosis in healthy organisms:

- Skin removed between fingers of babies before birth.