Cancer Biology

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The Cancer Biology portion of the site contains in-depth information about the structure and function of normal cells and cancer cells. The changes that make normal cells turn into cancer cells are described. Topics covered include:

Biological Building Blocks - Information on the molecules that are found in living things. Includes proteins, carbohydrates, lipids and nucleic acids.

Cell Structure - Discusses the functional parts of cells called organelles. Organelles covered include the nucleus, ribosomes, mitochondria and the cytoskeleton

The Cell Cycle - A look at the clock-like flow that cells go through when they are growing and dividing.

Cell Division - Covers the control of normal cell division and the defects seen in cancer cells.

Gene Function - Discusses the way genetic information is used in cells.

Mutation - Describes the types and causes of changes to genes (mutations) that can result in cancer.

Cancer Genes - Describes the types of genes (oncogenes and tumor suppressors) that are altered in cancer. Some key examples are given for each type of gene. Contains a section on microRNAs (miRNAs) and their role in cancer.

Cancer Epigenetics - Changes in DNA can be subtle, but have huge impacts on the way cells behave. Epigenetics is the study of these small but important changes.

Causes of Cancer - Includes details about the causes of cancer, including chemicals, radiation and viruses

Cancer Development - Cancer progresses in a stepwise manner, often taking years to become detectable. Learn about that process here.

Cancer Metabolism - All cells need energy and oxygen to survive. Cancer cells need a lot of energy to reproduce. Often, cancer cells don't get their energy the same way normal cells do, and this can impact their growth and their response to cancer treatments.

Cancer Cell Death (Apoptosis) - Most cancer drugs are designed to kill cancer cells. The death of cancer cells is a key step in stopping growth, and it happens in a very orderly fashion.

Angiogenesis - Animations and text describe how tumors develop a blood supply. Includes discussions of drugs that fight cancer by blocking this critical process.

Metastasis - The majority of cancer deaths are caused by the spread of the disease from its original location. This section covers the 'how' and 'why' of cancer spread. Also covered are attempts to interfere with the process in cancer patients.

Tumor-Host Interactions - There are many interactions between different cells in a tumor. This section covers some of the key cell types and the ways that they influence the growth of a tumor.

Microbiome - We are covered with (and full of) tiny organisms that influence our health for the better or worse. Learn about how these bacteria influence cancer growth and treatment responses.

The Immune System - The immune system is involved in guarding our bodies against internal and external threats, including cancer. Because of the important role of immune cells in preventing and possibly contributing to cancer, as well as the use of immune cells and products in treating cancer, the subject is treated here in detail.

Cancer in Domesticated Animals and Pets - Animals other than humans get cancer and this section examines a few types of cancer in dogs and cats.

Cancer in Wild Animals - For millions of years, wild animals have been getting cancer, including some strange ones that get spread when animals bite each other or mate.