Cancer Graphics Evaluation

Blood vessels in tumors

Comic showing the construction of normal blood vessels.

Normal blood vessels are built in an orderly fashion. The resulting new vessels are sturdy and don't leak.

Blood vessels created in response to signals from cancer cells are disorganized, leaky and weak.

Avoiding Cell Death

Normal cells are triggered to die by cellular suicide (apoptosis) when they become abnormal.

Cancer cells can avoid apoptosis in several ways. They can survive by producing protein 'shields'.

Cancer cells can also survive by making defective (mutated) 'death' proteins - or not making them at all

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Radiation Therapy

Radiation causes DNA damage and kills cancer cells. Cancer cells are already defective and are more likely to die than normal cells.

Enzyme (kinase) inhibitors - i.e. Gleevec®, Tarceva®, Sutent®

Kinases are important proteins (enzymes) that add small chemicals called phosphates (green) to proteins. Adding phosphates changes signals sent in cells. In normal cells,

kinases are active but regulated.

In cancer, key enzymes (kinases) become overactive - changing signals and causing cells to reproduce or survive when they shouldn't.

Graphic showing targeted cancer therapy jamming cellular machinery

Kinase inhibitors (small circles) are drugs that stick to, and block kinases in cancer cells. This prevents the signals and can kill the cells.

A summary: Normal cells have regulated activity, cancer cells are overactive and the cancer treatment jams the enzyme and kills cancer cells.

Biopsies

An excisional biopsy removes the entire tumor and nearby healthy tissue.

Needle biopsies are used to take samples of a suspected tumor. They can differ in the type of needle used and the number of samples taken.

Positron Emission Tomography (PET) scans

PET scans take advantage of the fact that cancer cells use lots of sugar to grow. An altered form of sugar is injected and then it can be detected when it collects in tumors.

Anemia

Our blood cells are made in our bones. Chemotherapy (red and white pills) affects both cancer cells and the normal cells.

Chemotherapy kills cancer cells but also damages and kills some normal cells.

The death of normal cells in the bone marrow means there are less red blood cells that are able to enter the blood - leading to anemia.

Infection

In healthy people, immune cells (with swords) are able to destroy invading germs (bacteria, viruses and others)

Cancer treatments reduce the number of immune cells able to fight infection. This means the person can be infected more easily.

Hormonal Treatments

Hormones are signals made in one cell that affect different cells. Some hormones can cause cancer cells to reproduce.

Some cancer drugs block the proteins that make hormones (like estrogen).

Cancer drugs can also prevent hormones from sticking to or entering cancer cells. They can also 'jam' hormone receptors inside cells. Either way, the hormone's signal is blocked.