

Vidya Bhawan Balika Vidyapeeth Lakhisarai

Arun Kumar Gupta

Class

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Sub. Biology

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12. Cancer can be defined as an uncontrolled growth or proliferation of cells without any differentiation.

- (i) In our body, cell growth and differentiation is highly controlled and regulated.
- (ii) The cancer cells divide repeatedly with uncontrolled cell divisions. They do not require extracellular growth factors.
- (iii) Cancer cells lost the property of contact inhibition (contact with other cells inhibit the uncontrolled growth).
- (iv) The repeated division of cancerous cells, form a large mass of cells called tumours.
- (v) Cancer cells move from tumour to new sites through blood for forming secondary tumours. This invasion of cancer cells from one part to other parts by the body fluids is called metastasis.
- (vi) Types of tumour and differences between them:
- vii) Cancer causing viruses are called oncogenic viruses. They have genes called viral oncogenes.
- (viii) Normal cells have genes called cellular oncogenes (c-onc.) or proto oncogenes, which are present in inactive state, but under certain conditions (like mutation) could lead to oncogenic transformation of the cells.
- (ix) Carcinogens are cancer causing agents. They may be
 - (a) Chemicals As in cigarette smoke, benzopyrene, dyes, paints, etc.
 - (b) Biological Oncogenic viruses, some parasites, etc.
 - (c) Physical Ionising radiation like X-rays and y-rays, non-ionising radiations like UV-rays.
- (x) Cancer can be detected by the following methods:
 - (a) Blood and bone marrow tests for increased cell counts.
 - (b) Biopsy and histopathological studies of the tissue.
 - (c) Radiography by X-rays, to detect cancer of the internal organs.
 - (d) Computed Tomography (CT) using X-rays, to generate a 3-D image of internal tissue.
 - (e) Resonance imaging involves use of non-ionising radiation and strong magnetic field to detect pathological and physiological changes in living tissue.
 - (f) Monoclonal antibodies against cancer-specific antigens are also used for cancer detection.
- (xi) Treatment of cancer involves following methods:
 - (a) Surgery Tumours are removed by surgery to check further spread of cancer cells.
 - (b) Radiation therapy Tumour cells are irradiated by lethal doses of radiation, taking

care to protect the surrounding normal cells.

(c) Chemotherapy Several chemotherapeutic drugs are used to kill cancer cells. But, their side effects like hair loss, anaemia is also reported.

Most cancers are treated by the combination of the above three.

(d) Immunotherapy Biological modifiers like α -interferons are used to activate the immune system and helps in destroying the tumour.