



Anti Cancer

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- Cancer drug treatments are of four broad types.

**I. Chemotherapeutic drugs:**

**II. Hormonal therapies .**

**III. Targeted therapies**

**IV. Immunotherapy:**

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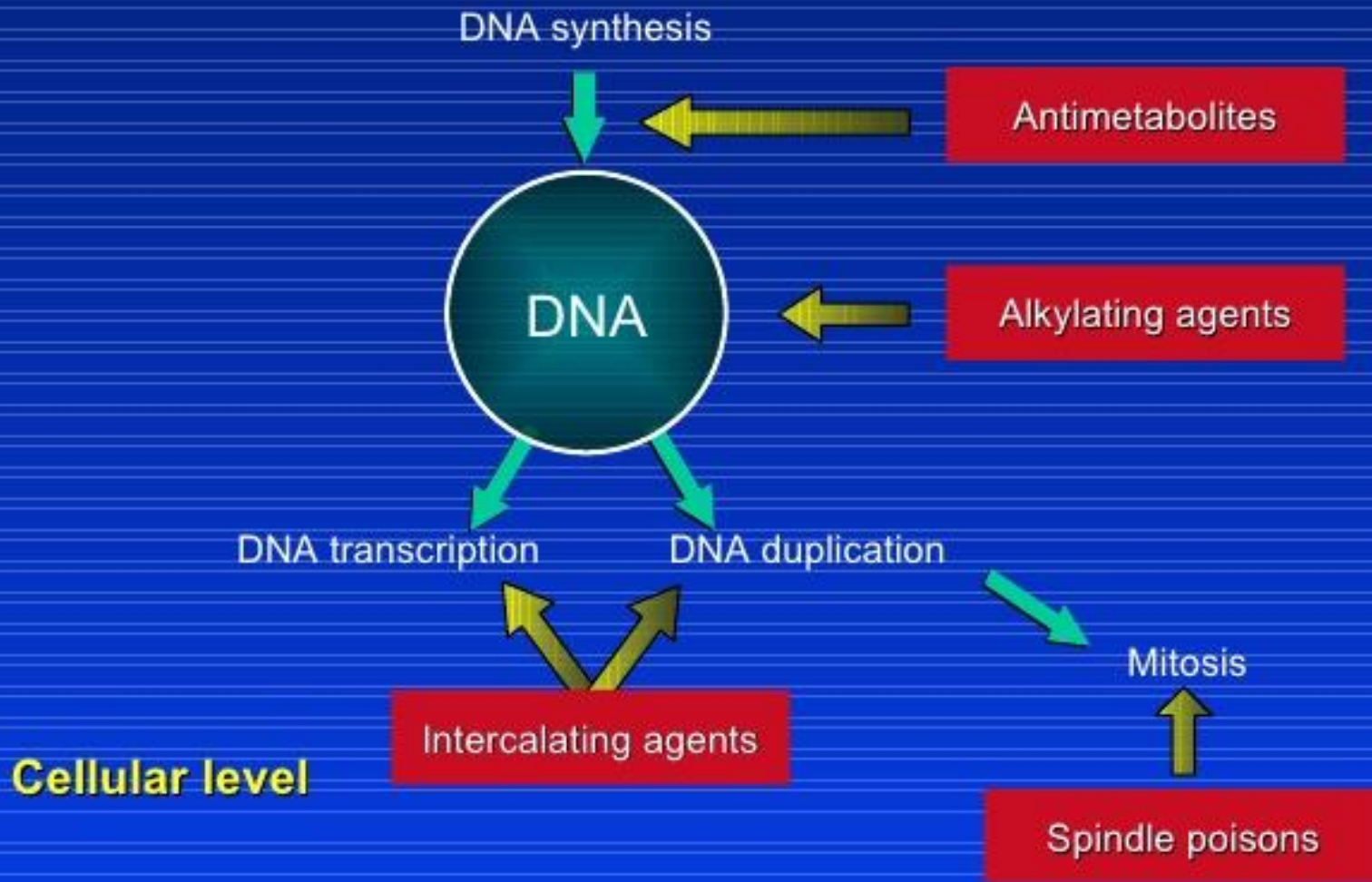
# I. Chemotherapeutic drugs

- These agents mainly target DNA structure or segregation of DNA as chromosomes in mitosis.
  - These are agents used in an attempt to destroy tumor cells by interfering with cellular functions including replication.
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# ONCOLOGY

## Principles of chemotherapy

Action sites of cytotoxic agents



## Groups of chemotherapy drugs

Drug class	Drugs examples	
I. Alkylating agents	Cisplatin, cyclophosphamide	
II. Antimetabolites	Methotrexate, 5- fluorouracil	
III. Microtubules inhibitors	Taxanes	Paclitaxel, docetaxel
	Vinca alkaloides	Vincristine, vinblastine



## Groups of chemotherapy drugs

Drug class	Drugs examples	
IV. Antibiotics	Bleomycine, dactinomycine	
V. Topoisomerase inhibitors	Topoisomerase I inhibitors	Irinotecan
	Topoisomerase II inhibitors	Anthracyclines (doxorubicin), anthracenedione (mitroxantrone), epodiphyllotoxin (etoposide),

# Side effects


- Unfortunately, most currently available anticancer drugs do not specifically recognize neoplastic cells but, rather, affect all kinds of proliferating cells both normal and abnormal.
  - Side effects divided into acute and late complications.
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# Early side effects

- Nausea & Vomiting.
  - Diarrhea.
  - Stomatitis inflammation of the mouth.
  - Mucositis: inflammation of the mucosal lining.
  - Alopecia.
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- Hypersensitivity reaction.
  - Myelosuppression: depression of bone marrow function, resulting in anemia, leukopenia and/ or thrombocytopenia
  - Reproductive systems: teratogenicity, early menopause.
  - Tumour lysis syndrome: increased urinary excretion of uric acid, which can cause renal damage.
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- CNS effects: peripheral neuropathies, loss of deep tendon reflexes, paralytic ileus, etc.
  - Damage to specific organs may occur, with resultant symptoms:
    - Ø Cardiotoxicity
    - Ø Hepatotoxicity
    - Ø Nephrotoxicity
    - Ø Encephalopathy
  - Miscellaneous: fatigue, depression.
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## Late side effects

Bone	Osteoporosis, avascular necrosis
Brain	Neuropsychiatric deficits, cognitive decline
Peripheral nerve	Neuropathy, hearing loss
Cardiac	Cardiomyopathy
Hematological	Aplasia, myelodysplasia, secondary leukemia
Lung	Pulmonary fibrosis, Pulmonary hypersensitivity
Kidney	Decreased function, electrolyte disturbance
Liver	Altered function
Gonads	Infertility, premature menopause



# **ONCOLOGY**

## ***Principles of chemotherapy***

Aim of combination therapy

***INCREASED EFFICACY***



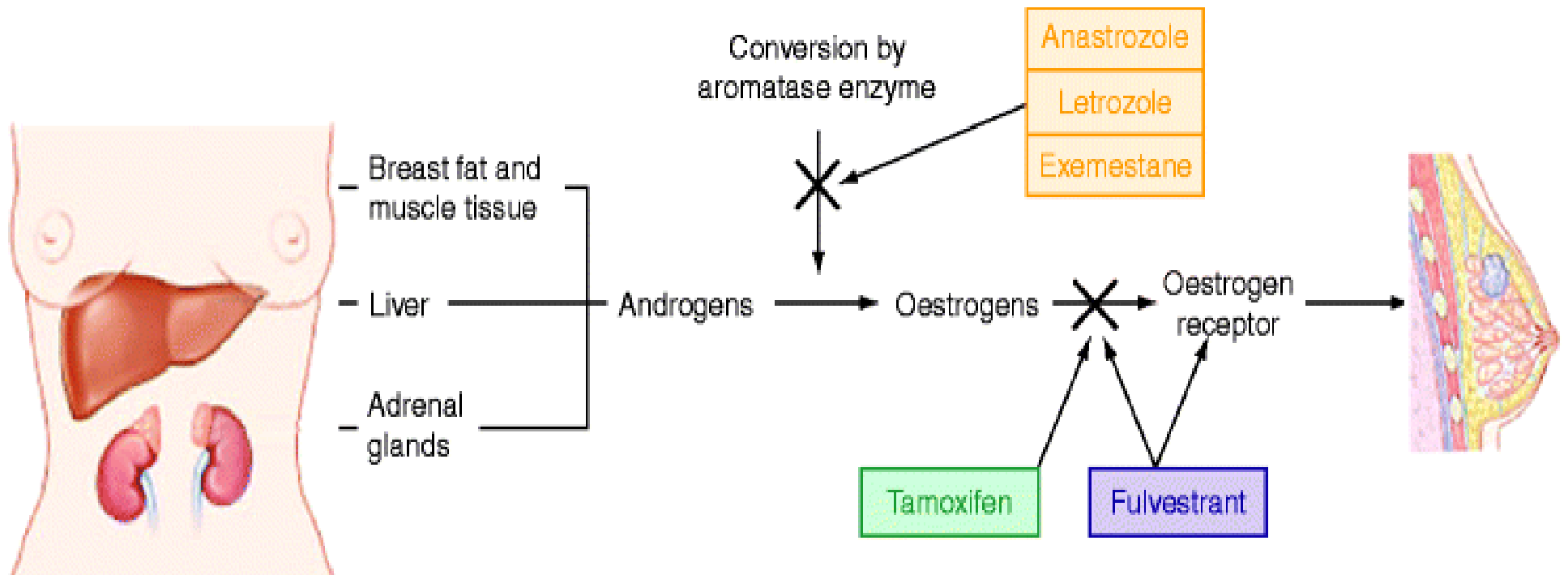
## II. Hormonal Therapy

- They act on the biochemical pathways underlying estrogen and androgen function and action as a therapeutic basis for approaching patients

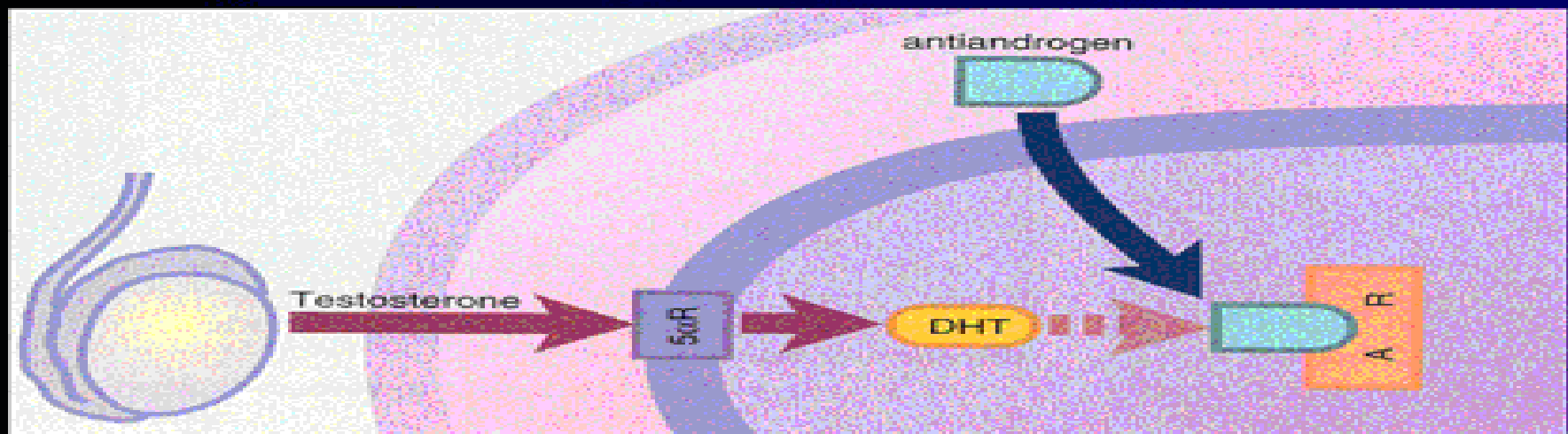
ü Oestrogens are stimulating the growth of breast and endometrial cancers,

ü Androgens the growth of prostate cancer.


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## Antiandrogens – Androgen Receptor Antagonists





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- The primary use of these agents is in the treatment of hormonally responsive cancers, such as breast, prostate, or endometrial carcinomas.
  - General side effects include: tiredness, digestive system problems, menopausal symptoms, effects on your muscles and bones, weight gain, memory problems, decrease in sexual desire and depression.
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# Types of hormonal therapy

- Drugs:

- ∅ Antiandrogens: Flutamide

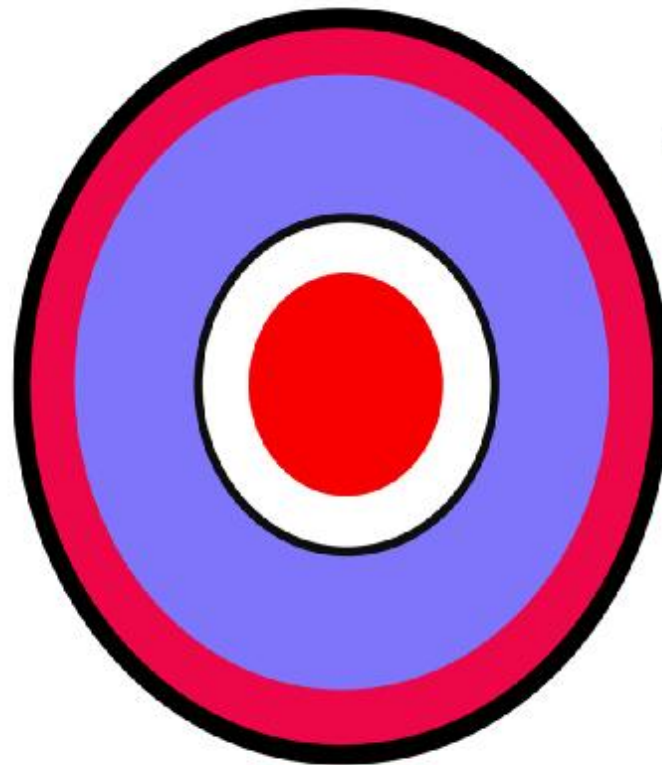
- ∅ Antiestrogens: Tamoxifen

- ∅ Aromatase inhibitors: Anastrozole

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# III. TARGETED THERAPY


- THEY ARE DRUGS THAT BLOCK THE GROWTH AND SPREAD OF CANCER BY INTERFERING WITH SPECIFIC MOLECULES INVOLVED IN TUMOR GROWTH AND PROGRESSION.



## TARGETED THERAPY

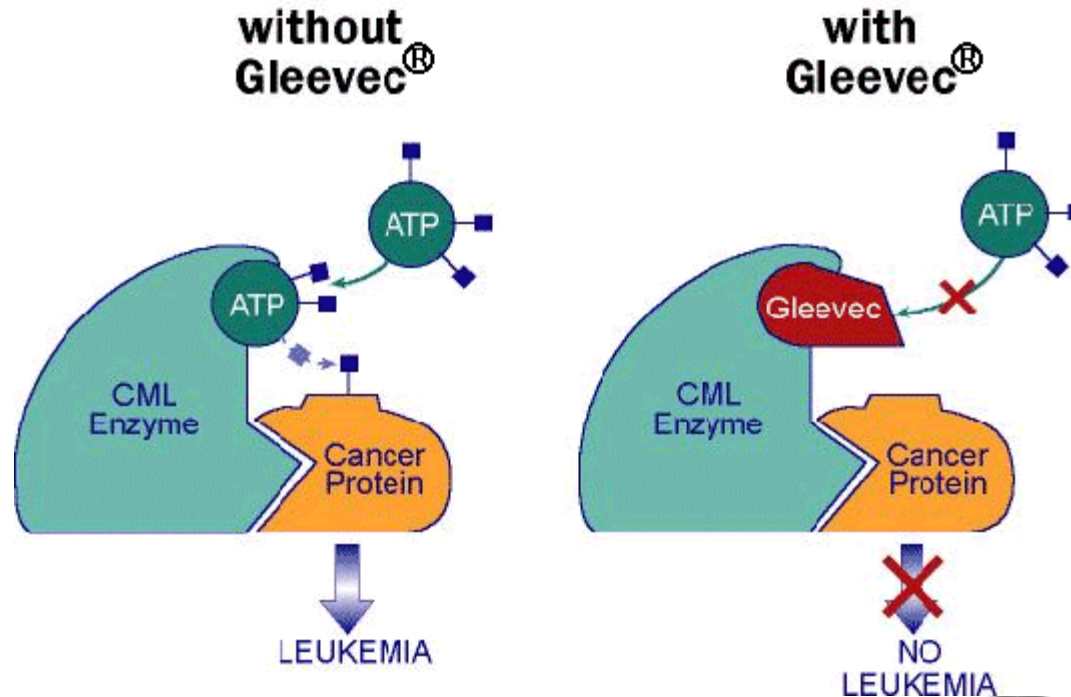
Avoids Normal  
Cells & Goes Directly  
to the Cancer Cells



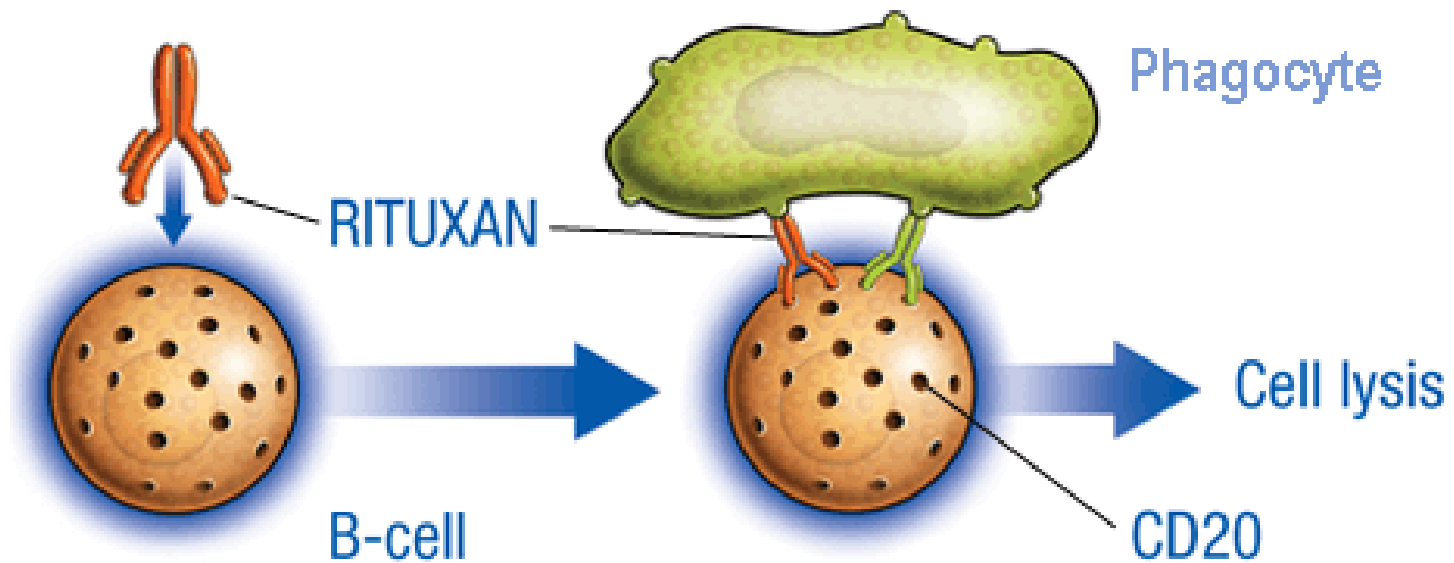
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- Targeted therapy can blocks the growth of cancer cells by interfering with specific targeted molecules needed for carcinogenesis and tumor growth, rather than by simply interfering with rapidly dividing cells (as with traditional chemotherapy).
  - This lead to targeting cancer cells more selectively, with reduced toxicity to normal tissues.
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- IMATINIB WAS DEVELOPED TO INHIBIT THE *BCR-ABL* GENE PRODUCT TYROSINE KINASE THAT IS RESPONSIBLE FOR CHRONIC MYELOID LEUKEMIA.

## Gleevec: HOW IT WORKS



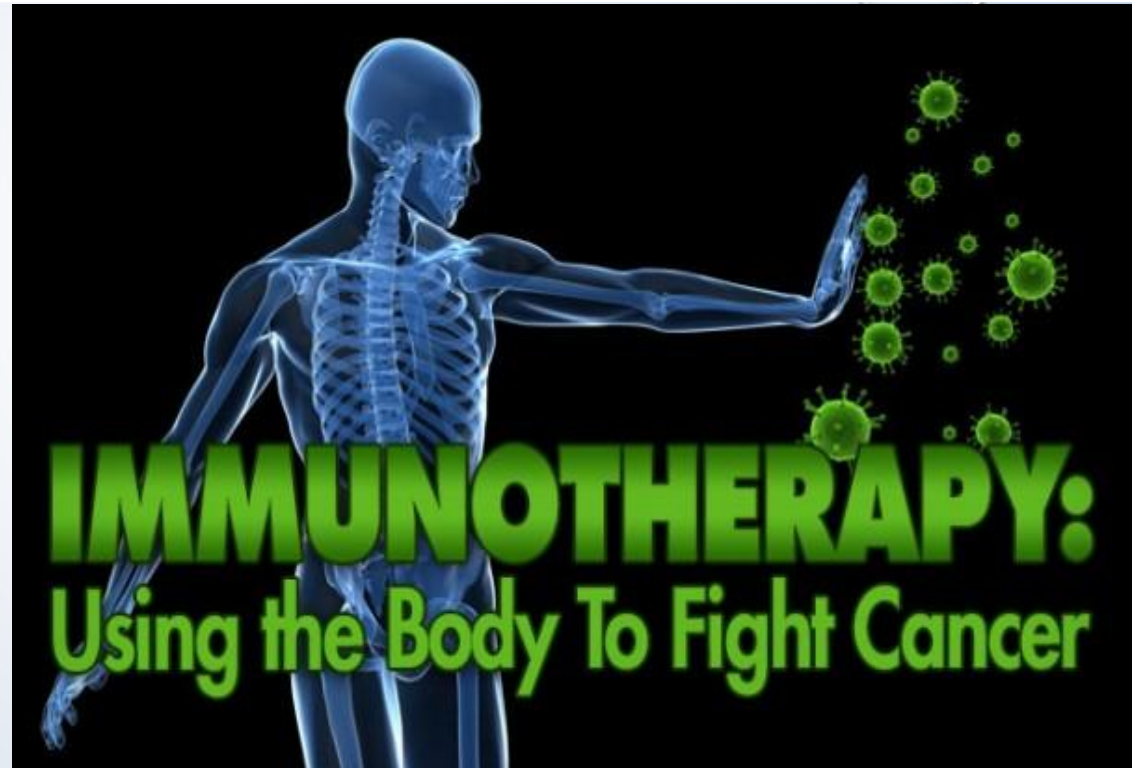
- RITUXIMAB ANTI CD-20



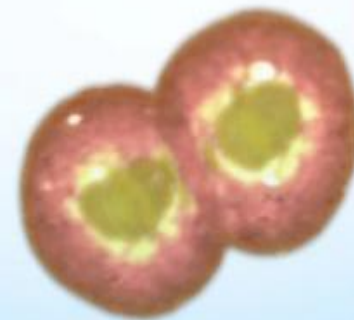



## IV. IMMUNOTHERAPY

- DRUGS HAVE THE CAPACITY TO REGULATE GROWTH OF TUMOR CELLS OR INDUCE A HOST IMMUNE RESPONSE TO KILL TUMOR CELLS.



**Immunotherapy:** Boosting the immune system to fight cancer



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- Immunotherapy are drugs use the body's immune system to fight cancer or to lessen the side effects that may be caused by some cancer treatments.
  - Two cancers, melanoma and renal cell carcinoma, are treated with interferon, interleukin-2, or both.
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