Alkylating agents

Sulfur mustard	Nitrogen mustard/ 1)Meclorethamine	Nitrosurea
	Given IV.	Streptoazocin
is converted into **episul-fonuim ion** attacked by nucleo-phile from cells and becomes alkylated biopol-ymer.	Becomes the unstable **aziridinuim ion** and then gives alkylated biopolymer.	
	2) Chlorambucil	
	Relatively stable; given oral.	
	Least toxic, long-acting.	
	3) Cyclophosamide	
	Active orally and parenterally.	

Both sulfur and nitrogen mustard are converted into unstable 3-membered (onium) intermediates that they act by.

Plant products

Vinca alkaloids	Ixabepilone
Include vincristine, vinblastine, vinrosidine, vinleurosine	semisynthetic amide analogue of the spindle poison, Epothilone B.
1) Paclitaxel (taxol)	Has lactam in its structure providing increased *invivo* stability.
MOA: spindle poison inhibiting mitosis.	Uses: Metastatic breast cancer

Plant products (cont)

Uses: ttt of breast, ovarian & **aids-related kaposi sarcoma**.

Signal transduction (PK) inhibitors

Imatinib mesylate	Sorafenib tosylate
MOA: Competitive inhibition of TK--> inducing **apoptosis or non-dividing cells.**	MOA: Broad spectrum kinase inhibitor
Uses: CML, GIST, acute lymphoblastic leukemia (+ve philadelphia chromo-somes)	Uses: renal cell carcinoma and colon cancer
SE: thrombocytop-enis, skin rash, N/V, pulmonary edema.	SE: Skin rash, HTN, fatigue, increased risk of bleeding & wound healing time.

Advantage: Orally administered, better patient tolerability.
Disadvantage: Cardiotoxicity

Resistance to tyrosine kinase forms:
- Altering amino a' to stop binding
- Increasing kinase levels
- Drug is substrate to efflux transporter, BCRP.

Anti-metabolites

Pyrimidine antimetabolites	Purine antime-tabolites	Folic a' antimetab-olites
1) 5-FU	1) 6-MP	1) Methotrexate
MOA: thymid-ylate synthase inhibitor or incorporated into RNA & DNA.	Is *invivo* converted into 6-thionos-inate.	MOA: dihydrofolate reductase inhibitor

Anti-metabolites (cont)

2) Uracil mustard	MOA: inhibits the rate-l-imiting step during purine synthesis.	Uses: remission in leukaemia and breast cancer management.
Alkylating agent.	Uses:	
MOA: Damages DNA that in take in uracil.	- with methotraxate for lymphocytic leukemia.	
Uses: Non-ho-dgkins lymphoma	- Immunosuppressive for UC, psoriatic arthirits, systemic lopus erythromatosis.	
	Allopurinol potentiates its effect by inhibiting its metabo-lism.	

Miscellaneous compounds

Platinum complexes	Synthetic retinoid analog
1) Cisplatin	1) Bexarotene
MOA: Cross-links DNA causing DNA confor-mational changes.	MOA: binds to activated retinoid X receptors in skin.
Uses: **with bleomycin & vinblastine** for metastatic testicular tumors.	Use: cutaneous T-cell lymphoma
2) Carboplatin	

Immunotherapy/monoclonal antibodies

**Block	**Flag	**Deliver
1) Trastu-zumab	1) Rituximab	1) Brentuximab vedotin
Blocks HER-2 receptors to stop growth.	chimeric (hybrid) monoclonal antibody.	Delivers chemotherapy drugs inside tumor cells.
2) Bevaci-zumab	Flag malignant B lympho-cytes with CD20 receptor for the immune cells.	
Blocks VEGF--> no new blood vessels.	Use: Non-Hodgkins B-cell lymphoma.	

MOA: targeted therapy by **selective binding on receptor to--****

Antibiotics

Anthracyclines	Actinomycin
1) Danorubicin HCl	1) Bleomycin
MOA: intercalates into DNA causing indirect inhibition of topoisomerase II--> decreased RNA & DNA synthesis.	Has multiple heterocyclic rings and cytotoxic glycosides.
SE: Cardiotoxicity, release of hydroxyl and superoxide radicals.	MOA: Fragme-ntation of DNA.
2) Doxorubicin HCl	2) Mitomycin C
Uses: Acute leukaemia, Hodgkins's disease	3 anti-cancer functional gps: Quinone + Aziridine + Carbamate.

Antibiotics (cont)

MOA: cross-links double helical DNA

Unreactive in natural state--reduction--> Indol-hydroquinone (bifunctional alkylating agent)

Hormones

Testolactone	Tamoxifen	Letrozole
MOA: Aromatase inhibitor stopping estrogen synthesis from testos-terone.	Non-steroidal agent with anti-estrogen properties.	MOA: Aromatase inhibitor
Uses: Breast cancer in post-meno-pausal women.	MOA: binds to estorgen receptors resulting in decreased DNA transc-ription.	Uses: locally advanced or metastatic breast cancer.
	Uses: breast cancer in post-menopausal women.	