

## UNIT – 1

### MEDICINAL CHEMISTRY 2

#### H1-Antagonists:

1. **Diphenhydramine hydrochloride:** Commonly used for allergies, hay fever, and as a sleep aid.
2. **Dimenhydrinate:** Primarily used to prevent and treat nausea, vomiting, and dizziness caused by motion sickness.
3. **Doxylamines succinate:** Used as a sedative to treat insomnia and to relieve symptoms of hay fever, allergic rhinitis, and the common cold.
4. **Clemastine fumarate:** An antihistamine used to relieve allergy symptoms such as watery eyes, itching, and sneezing.
5. **Tripelenamine hydrochloride:** Used as a nasal decongestant and to relieve symptoms of hay fever.
6. **Chlorcyclizine hydrochloride:** An antihistamine used to relieve symptoms of allergy, hay fever, and the common cold.
7. **Meclizine hydrochloride:** Used to treat motion sickness and dizziness.
8. **Buclizine hydrochloride:** Used to prevent and treat nausea, vomiting, and dizziness associated with motion sickness.
9. **Chlorpheniramine maleate:** Relieves symptoms of allergy, hay fever, and the common cold.
10. **Triprolidine hydrochloride:** An antihistamine used to relieve symptoms of allergy, hay fever, and the common cold.
11. **Phenidamine tartarate:** Used for its antihistaminic and anticholinergic effects.
12. **Promethazine hydrochloride:** Often used for allergies, motion sickness, and nausea.
13. **Trimeprazine tartrate:** An antihistamine used to relieve symptoms of allergy, hay fever, and the common cold.
14. **Cyproheptadine hydrochloride:** Used to treat allergic reactions and to relieve symptoms of allergic conditions.
15. **Azatidine maleate:** An antihistamine used to relieve symptoms of allergy, hay fever, and the common cold.
16. **Astemizole:** A second-generation antihistamine that is no longer widely used due to safety concerns.
17. **Loratadine:** Used to relieve symptoms of allergy, hay fever, and the common cold.
18. **Cetirizine:** Used for allergy symptoms such as sneezing, itching, and runny nose.
19. **Levocetrazine:** An antihistamine used for allergy symptoms.

**Cromolyn Sodium:** Not an H1-antagonist, but rather a mast cell stabilizer. It's used to prevent allergic reactions.

### **H2-Antagonists:**

1. **Cimetidine:** Used to reduce stomach acid production and is often used to treat heartburn and peptic ulcers.
2. **Famotidine:** Also used to reduce stomach acid production and treat conditions such as heartburn and ulcers.
3. **Ranitidine:** Similar to cimetidine and famotidine, used to reduce stomach acid and treat various gastrointestinal conditions.

These medications work by blocking the action of histamine, a substance in the body that is involved in allergic reactions and gastric acid secretion. H1-antagonists primarily target histamine receptors in the respiratory and vascular systems, while H2-antagonists target receptors in the stomach, reducing acid secretion. Always consult with a healthcare professional before taking any medications, as they can have side effects and interactions with other drugs.

### **Gastric Proton Pump Inhibitors (PPIs):**

Gastric PPIs are a class of medications that reduce the production of stomach acid by blocking the enzyme in the stomach lining that produces acid. They are commonly used to treat conditions where excess stomach acid causes discomfort or damage to the esophagus. Here are some details about specific PPIs:

1. **Omeprazole:**
  - **Mechanism of Action:** Omeprazole inhibits the proton pump in the stomach lining, reducing gastric acid secretion.
  - **Clinical Uses:** It is used to treat conditions such as gastroesophageal reflux disease (GERD), peptic ulcers, and Zollinger-Ellison syndrome.
  - **Administration:** Usually taken orally, and it's often available in delayed-release capsules or tablets.
2. **Lansoprazole:**
  - **Mechanism of Action:** Similar to omeprazole, lansoprazole inhibits the proton pump in the stomach lining.
  - **Clinical Uses:** Commonly prescribed for GERD, peptic ulcers, and other conditions associated with excess stomach acid.
  - **Administration:** Typically administered orally in the form of capsules or orally disintegrating tablets.
3. **Rabeprazole:**
  - **Mechanism of Action:** Rabeprazole suppresses gastric acid production by inhibiting the proton pump.

- **Clinical Uses:** Used for GERD, erosive esophagitis, and certain hypersecretory conditions.
- **Administration:** Usually taken orally, often as delayed-release tablets.

#### 4. Pantoprazole:

- **Mechanism of Action:** Pantoprazole inhibits the proton pump, leading to a reduction in gastric acid production.
- **Clinical Uses:** Prescribed for conditions like GERD, peptic ulcers, and Zollinger-Ellison syndrome.
- **Administration:** Typically taken orally in the form of delayed-release tablets.

### Anti-neoplastic agents:

#### Alkylating Agents:

##### 1. Meclorethamine:

- **Mechanism of Action:** Alkylating agent that interferes with the growth of cancer cells.
- **Clinical Uses:** Used in the treatment of various cancers, including Hodgkin's lymphoma.

##### 2. Cyclophosphamide:

- **Mechanism of Action:** Alkylating agent with broad anti-tumor activity.
- **Clinical Uses:** Used in the treatment of various cancers, including breast cancer and lymphomas.

##### 3. Melphalan:

- **Mechanism of Action:** Alkylating agent that inhibits DNA synthesis in cancer cells.
- **Clinical Uses:** Commonly used in the treatment of multiple myeloma.

#### Antimetabolites:

##### 1. Mercaptopurine:

- **Mechanism of Action:** Interferes with the synthesis of DNA and RNA in cancer cells.
- **Clinical Uses:** Used in the treatment of leukemia.

##### 2. Methotrexate:

- **Mechanism of Action:** Inhibits an enzyme involved in the synthesis of folic acid, crucial for DNA synthesis.
- **Clinical Uses:** Used to treat various cancers, including leukemia and breast cancer.

Antibiotics:

1. **Dactinomycin:**

- **Mechanism of Action:** Inhibits DNA and RNA synthesis in cancer cells.
- **Clinical Uses:** Used in the treatment of certain types of cancer, including Wilms' tumor and Ewing sarcoma.

2. **Daunorubicin and Doxorubicin:**

- **Mechanism of Action:** Inhibit DNA and RNA synthesis and can intercalate into DNA.
- **Clinical Uses:** Commonly used in the treatment of various cancers, including leukemia and breast cancer.

3. **Bleomycin:**

- **Mechanism of Action:** Induces breaks in DNA strands, inhibiting DNA synthesis.
- **Clinical Uses:** Used in the treatment of testicular cancer and lymphomas.

Plant Products:

1. **Etoposide:**

- **Mechanism of Action:** Inhibits DNA synthesis and causes DNA strand breaks.
- **Clinical Uses:** Used in the treatment of lung cancer and testicular cancer.

2. **Vinblastine Sulfate and Vincristine Sulfate:**

- **Mechanism of Action:** Inhibit cell division by disrupting microtubule formation.
- **Clinical Uses:** Used in the treatment of various cancers, including lymphomas and leukemias.

Miscellaneous:

1. **Cisplatin:**

- **Mechanism of Action:** Forms DNA cross-links, preventing cell division.
- **Clinical Uses:** Used in the treatment of various cancers, including testicular and ovarian cancers.

2. **Mitotane:**

- **Mechanism of Action:** Thought to work by damaging the adrenal glands.
- **Clinical Uses:** Used in the treatment of adrenal cortical carcinoma.

These medications are powerful tools in the fight against cancer, but they often come with significant side effects. The choice of a specific agent depends on the type and stage of cancer,

as well as the patient's overall health. Always consult with a healthcare professional for personalized advice and information on these medications.

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