



B.Sc. Third Year V Semester CHEMISTRY

Paper XII [Organic + Inorganic]
Organic Chemistry



SYNTHETIC DRUGS

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NATURAL DRUGS



Morphin Heroin Cocai



SEMISYNTHETIC DRUGS



SYNTHETIC DRUGS



INTRODUCTION

SYNTHETIC DRUGS



➤ Drug, French word *Drogue* = Dry herb (small plant) used as Medicine.

➤ Drug is a substance used in the prevention, diagnosis, treatment or cure diseases in man or other animals or host.

➤ 'WHO', Drug as a any substance or product which is used or intended to be used for modifying or exploring physiological systems or pathological states for benefit of the recipient.

IDEAL DRUGS

- Drug generally tends to distribute itself any where in the tissues of host.
- It should act on system with efficiency & safety.
- Minimum side effect, Not have any toxicity, No any allergic reaction.
- Not injure host tissue or physiological system, Safe & convenient for Doctor.
- No any resistance & any tolerance, Must inflammable and in explosive in nature.
- Easily available in market & less expensive as compared economically.



CLASSIFICATION OF DRUGS

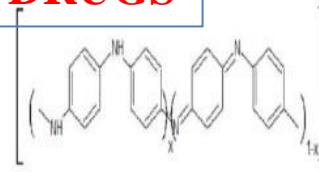
1) Chemical Structural Unit.

2) Therapeutic Action.

Therapeutic = a curative branch of medicine.

I) Functional / Pharmacodynamic Agents.

II) Chemotherapeutic Agents.



I: FUNCTIONAL AGENTS

Drug which varies various functions of drugs.

ANESTHETICS

Anesthetic, anesthesia means insensibility to produce unconsciousness and muscular relaxation sufficient to allow the performance of surgical operation.

Local Anesthetic

Particular parts of body produce to localized insensibility to pain but donot cause of consciousness.

Dental operation ; **Ex.** Ethylene oxide

Ophthalmic operation ; **Ex.** Alpine, cocaine derivative

Central (General) Anesthetic

Depress the C.N.S. to such an extent that all sensitivity to pain or feeling is lost i.e. They produce unconsciousness all over the body.

Ex. CHCl_3 , produced phosgene(COCl_2) gas which is highly toxic. Ethylenediviny ether, Chloropropene, Cyclopropane

It is used for major operations like scissoring, hearts, bone fracture.

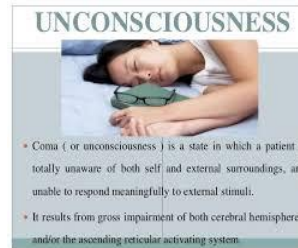
ANALGESICS

By virtue of their action on the C.N.S. to decreases sensation of pain or relieves pain.



Narcotic

They produce analgesia sleep and in high doses cause unconsciousness.
Ex. Morphine. Codeine and Pethidine.



Non Narcotics

These are the drugs which are not so potent and relative pain cause addiction. They usually produce an antipyretic action also.

Ex. Aspirin, Analgin, Novalgin, Explain

ANTIPIYRETIC

Drugs which is responsible for lowering the temperature of a feverish organism to normal but donot effect on normal temperature states. Paracetamal, Aspirin, Quinodine derivative .



SEDATIVE

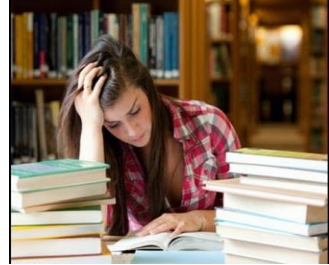
Drug acts mild CNS depressant that reduce (relieve) restlessness and tension without producing sleep.
Ex. Alcohol; [Ethanol, trichloroethanol], Aldehyde ; chloral ketenes ; Acetophenone, Sulphones ; Sulphanol.



HYPNOTICS

CNS depressant that produce sleep to reduce restlessness & emotional tension. Patient cannot be easily awakened until effect of hypnotics wears out.

Ex. Alcohol, Morphine, Codeine, Pethidine



Large dose → Sedation ↔ Hypnosis ↔ Anesthesia ↔ Coma ↔ Death.

ANTI INFLAMMATORY : (Tending to Inflammation)

Inflammation, as a series changes that take place in the tissue different types of injury and various bacteria caused by variety of conditions.

Inflammation cause more crippling than other chronic illness.

Rheumatic as connective tissue diseases like arthritics, Orthoarthritics, Spondylitis, Psoriasis, Rheumatic fever, Gout.

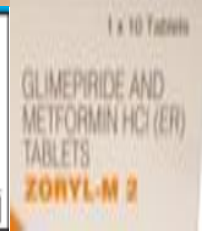
Ex. Ibuprofen, Flexon, Naproxen, Mefanamic acid, EnzoFlam.



ANTI-DIABETIC

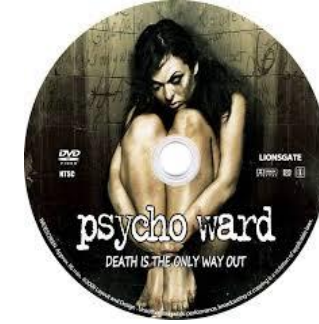
Diabetes is caused due to the deficiency of effective insulin a hormone secreted by β - cells of the pancreas. The reason for diabetes is not known with certainty. It is agreed that tendency to diabetes is inherited Insulin control carbohydrates, metabolism and also lipid & protein metabolism, diabetic is not able metabolize glucose at normal rate.

Ex. Glipizide, Tolbutamide, Glumin-MF, Glyburide, Zoryl-M1, M2



TRANQUILLIZERS

Drugs used in the treatment of mental disorder they bring about mental tension and relieve anxiety (in proper mood) . It directly act as CNS drug hence called psychophetic patient.



Ex. Reserpine, Chlorprothixene, Benzodiazepine, Chloromethizole.

II : CHEMOTHERAPEUTIC AGENTS.

Chemotherapy was introduced by *Paul- Ehrlich in 1909* & called, *Father of Chemotherapy*. Diseases caused by infection with micro organism like bacteria fungi, virus, protozoans are treated with chemical substances which destroy micro organisms but do not affect tissues of host. They are used in the treatment of specific diseases.

ANTIMALERIAL

Malaria, Italian word [Mal = bad, Aria = air]

Malaria was and is still recognized as a disease of world wide incidence and highly wide spread infections disease caused by *Sporozoa* of genus *plasmodium*, Which are transmitted by female of *Anopheles* mosquitoes to bite man & back again.

Ex. Quinoline derivatives : Chloroquine, Primaquine, Sentaquine, Pentaquine, Paludrine.

Symptoms of Malaria



ANTIBIOTICS

Antibiotics = Antibiosis means survival of fittest.

A process in which one organism may destroy another to preserve itself.





Antibiotics is a chemical substance produced by or derived from living cells which is capable in small concentrations of inhibiting life processes or even destroying micro organisms. **OR**



They are substances which cure the diseases caused by bacterial infection such as pneumonia, meningitis, septicemia etc. are capable of suppressing and even eradicating bacterial infection of the body.

Alexander Fleming First antibiotics discovered,
Ex. Penicillin, G,F,H, Chloromycetin, Streptomycin, Amoxicillin.

ANTIFUNGAL

Drugs which is used in the treatment of fungal diseases. Previously fungal infection was regarded as an uncommon disease. Now recent year fungal infection are world wise in nature & are systematic as well as local among individuals of all ages. Many remedies have been used against fungus infection, like tinea capitis (Skin disease) .



Ex. Salimidol, Miconazole nitrate, Candicidin, Clotrimazole.



ANTITUBERCULARS

Tuberculosis(T.B.) old as mankind diseases.
Drugs to curve tuberculosis bacterial infections called antituberculars systematic infections diseases which caused in man by organisms like *mycobacterium tuberculosis* and *mycobacterium bovis*. About 1-2 million peoples die every year due to T.B.

Tuberculosis bacillus have been found common in lungs of host.

Ex. Isonizide, Rimifon, Rifampin, Cycloserine, Rifadin.



ANTIVIRAL

Viruses are obligate parasites that need the active participation of the metabolic processes invaded cells.

Virus disease like eye infection and mouth infection.

Drugs are used for cure infectious diseases caused by viruses.

Ex. Idoxuridine, Cytarabine, Amantadine, Methisazone.



ANTISEPTICS

Greek word, Septikos = Putrify = Rot (Pus forming organism)

Drugs directly applied to the living tissues like skin wound is Known as antiseptic, is a Bacteriostatic drug, long time duration



DISINFECTANTS

Are bactericidal which are applied to non living surfaces or inanimate surfaces rapidly produce irreversible lethal effect. Short time duration.

Ex. Alcohols, Aldehydes, Phenols, Esters, Chlorine, Iodine, Eusol, Vioform, Aristol.



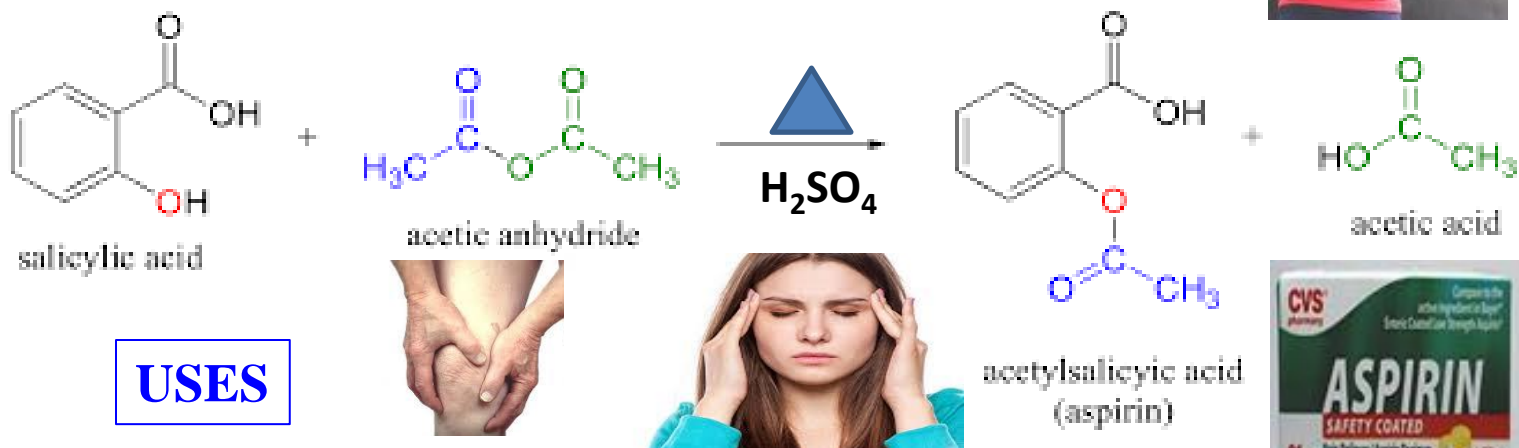
DISINFECTANTS



SYNTHESIS & USES OF DRUGS



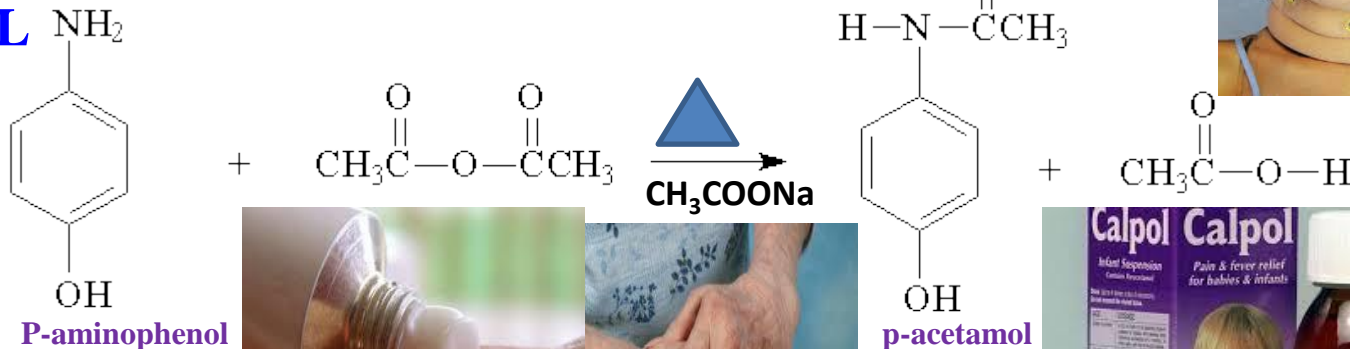
1. ASPIRIN



USES

- Analgesic, Headache, Bodayache, Arthritis (Joint pains) .
- Anti inflammatory, Spondylitis, Rheumatoid arthritis .
- Anti pyretic action.

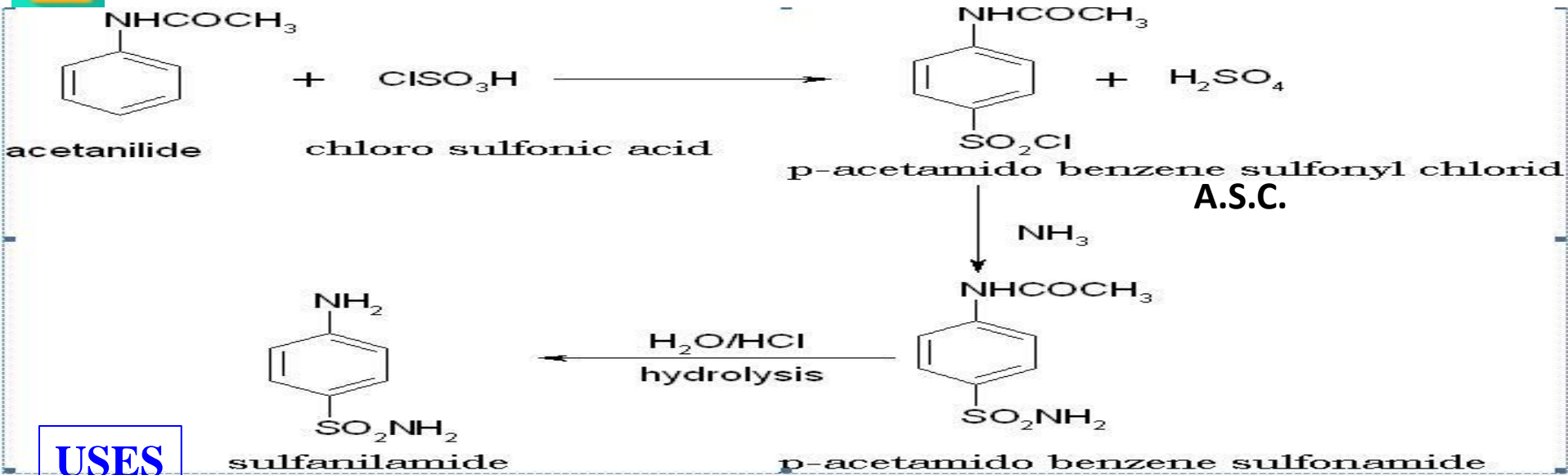
2. P- ACETAMOL



USES

- Anti pyretic.
- Analgesic.

3. SULFANILAMIDE (P- AMONOBENZENE SULPHONAMIDE)

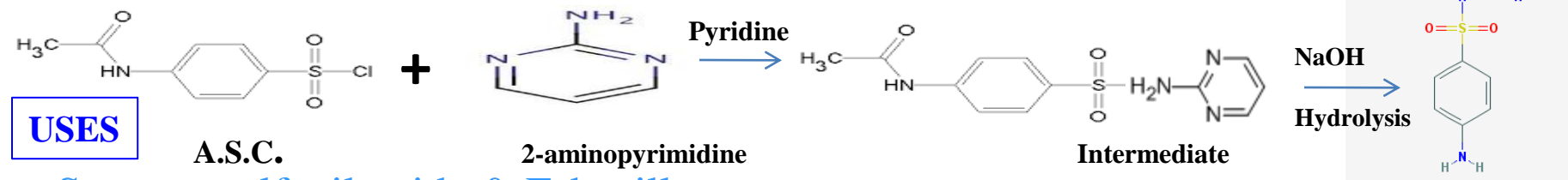


USES

- Bacteriostatic, control bacterial infections.
- Pneumococci, Streptococci (T.B.) .
- Meningococci, Gonococci.



4. SULFADIAZINE (2-SULPHANILAMIDOPYRIMIDINE)



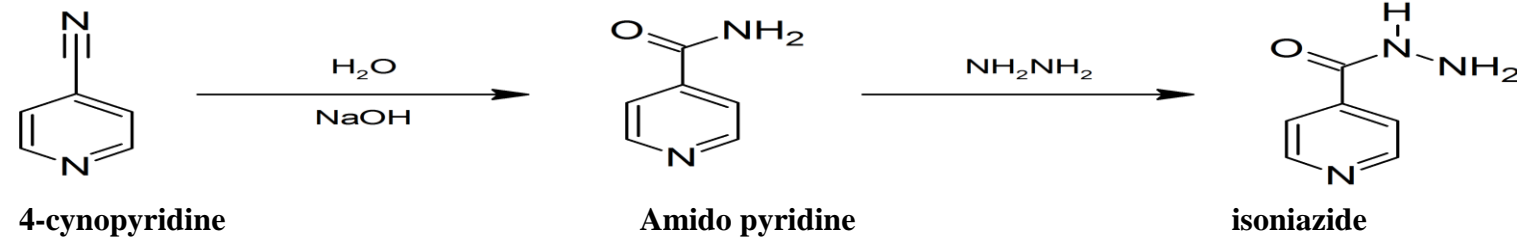
USES

- Same as sulfanilamide & F. bacillus.



Sulfadiazine

5. ISONIAZIDE

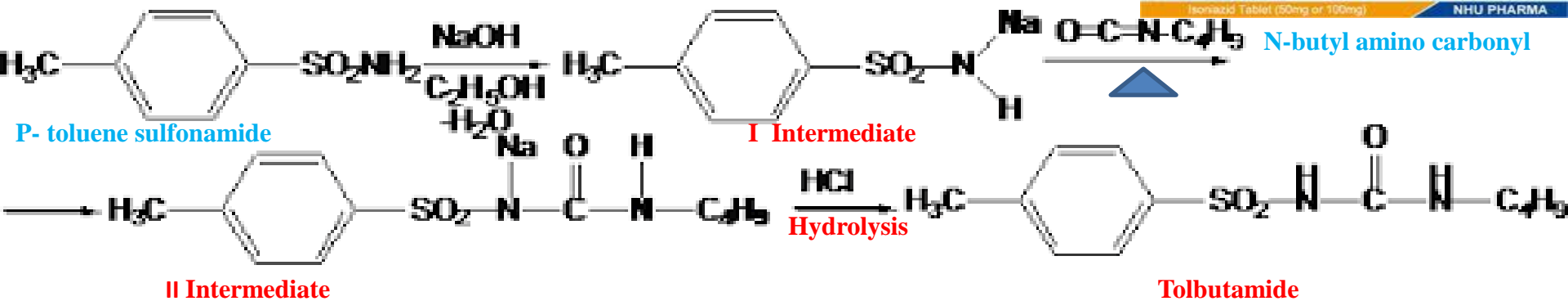


USES

- Tuberculosis (T.B.) treatment .



6. TOLBUTAMIDE

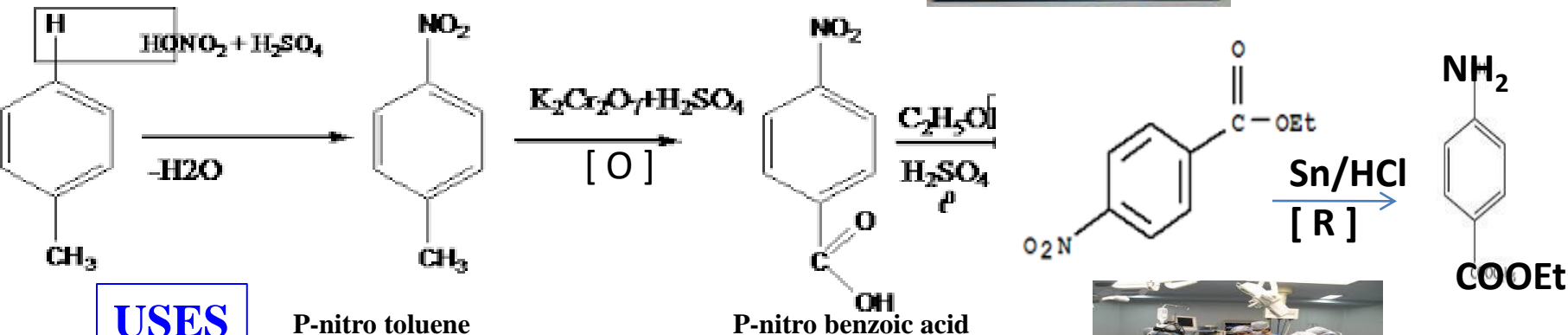


USES

- Antidiabetic drugs.
- Stimulate the secretion of insulin by β -cell of pancreas so used treat diabetic patients.

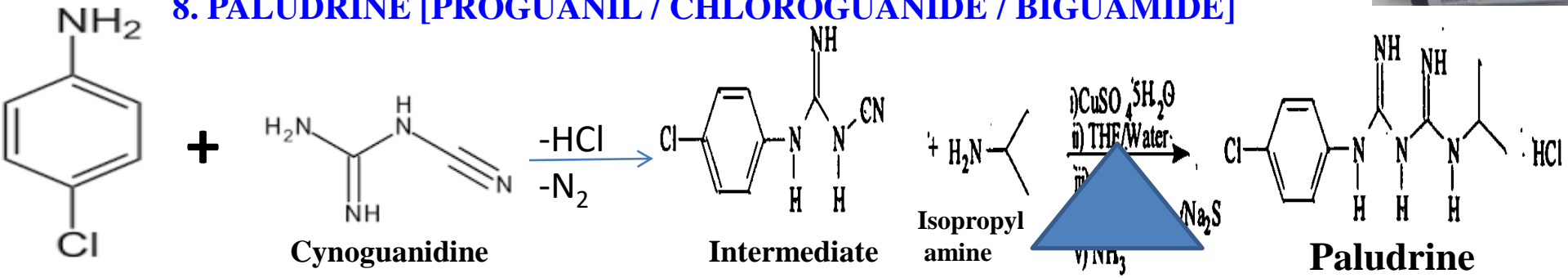


7. BENZOCAINE



- Anaesthetics, Prevent nausea & vomiting.
- Hypodermic infection (subcutin), 20% lotion act as surface pain & itching.

8. PALUDRINE [PROGUANIL / CHLOROGUANIDE / BIGUAMIDE]



- Antimalarial.
- Vivax & falciparum malaria.

Learning Never Ends...

.....**SUGGESTION** ?

Created by, Dr. Subhash Lonkar

THANKS.....

