

Orphan Drugs

- When a drug is not developed into a usable medicine because the costs will not be recovered by the developer then it is known as orphan drug & the disease is an orphan disease.
- Orphan drugs are those which are used for treatment, prevention or diagnosis of rare diseases like Kala-Azar, Cancers, Heavy metal Poisoning.

- 11 Orphan Drugs
 - When a drug is not developed into a viable medicine because the costs will not be recovered by the developer then it is known as orphan drug & the disease is an orphan disease.
 - Orphan drugs are those which are used for uncommon, prevention or diagnosis of rare diseases like Malaria, Cancer, Heavy metal Poisoning.
- 12 Sources of Drugs
- 13 Sources of Drugs
 - Natural –
 - Plants, microorganisms, animals, minerals.
 - Semi-synthetic.
 - Synthetic.
 - Biosynthetic.
 - Gene based therapy (Gene therapy).
- 14 Natural Sources
- 15

Sources of Drugs

- Natural –
 - Plants, microorganisms, animals, minerals.
- Semi-synthetic.
- Synthetic.
- Biosynthetic.
- Gene based therapy (Gene therapy).

SK From Shehroz khan 122 to Everyone

F18-122

13

Sources of Drugs

- Natural –
 - Plasma, micronutrients, extracts, essential oils
- Semi-synthetic
- Synthetic
- Bio-synthetic
- Gene based therapy (Gene therapy)



14

Natural Sources

15

- > Morphine (extract from opium)
- > Heroin
- > Codeine

unripe capsules papaver somniferum (Opium Poppy)
(PLANT SOURCES)

16

> Nicotine, source is tobacco




17

> Caffeine (CNS stimulant) in tea



➤ **Morphine (opioid analgesic)**

➤ **Heroin**

➤ **codeine**

unripe capsules papaver somniferum (Opium Poppy).

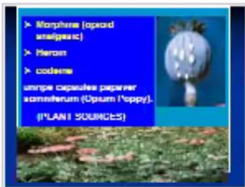
(PLANT SOURCES)

15

- > Morphine (opoid narcotic)
- > Heroin
- > codeine

unripe capsule pepper
 eschscholus (Opium Poppy)
 (FLAN SOURCES)



16

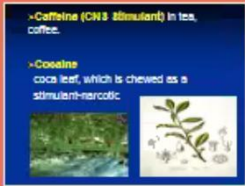
> Nicotina,
 source is tobacco



17

> Caffeine (CNS stimulant) in tea, coffee.

> Cocaine
 coca leaf, which is chewed as a stimulant-narcotic



18

- > Atropine (Anticholinergic) — from leaves of atropa belladonna.
- > Ephedrine (Sympathomimetic) — from plant Ephedra Vulgaris
- > Quinine (Antimalarial) — from bark of Cinchona.
- > Meserine (Antihypertensive) — from roots of Rauwolfia serpentina

19



Animal Sources



Window away from

> **Caffeine (CNS Stimulant)** in tea, coffee.

> **Cocaine**
 coca leaf, which is chewed as a stimulant-narcotic

FILE HOME INSERT DESIGN TRANSITIONS ANIMATIONS SLIDE SHOW REVIEW VIEW

Cut Copy Paste Format Painter New Slide Layout Reset Section Font Paragraph Drawing Editing

- 15 Morphine (opoid analgesic)
Narcosis
codeine
simple capsules preparation
sambonum (Opium Poppy)
(PLANT SOURCES)
- 16 Nicotine,
Source is tobacco
- 17 Caffeine (CNS stimulant) in tea, coffee.
Cocaine
coca leaf, which is chewed as a stimulant-narcotic
- 18 Atropine (Anticholinergic) ---
from leaves of atropa belladonna.
Ephedrine (bronchodilator) ---
from plant Ephedra Vulgaris
Quinine (Antimalarial) ---
from bark of Cinchona.
Reserpine (Antihypertensive) ---
from roots of Rauwolfia serpentina
- 19 Animal Sources

- **Atropine (Anticholinergic) ----**
from leaves of atropa belladonna.
- **Ephedrine (bronchodilator) ----**
from plant Ephedra Vulgaris
- **Quinine (Antimalarial) ----**
from bark of Cinchona.
- **Reserpine (Antihypertensive) ----**
from roots of Rauwalfia serpentina

FILE HOME INSERT DESIGN TRANSITIONS ANIMATIONS SLIDE SHOW REVIEW VIEW


Cut Copy Paste Format Painter New Slide Layout Reset Section Font Paragraph Drawing Editing

- 17 Caffeine (CNS stimulant) in tea, coffee. Cocaine coca leaf, which is chewed as a stimulant-narcotic.
- 18 Atropine (Anticholinergic) from leaves of atropa belladonna. Ephedrine (bronchodilator) from plant Ephedra Vulgare. Quinine (Antemalarial) from bark of Cinchona. Measurine (Antihypertensive) from roots of Rauwolfia serpentina.
- 19 Animal Sources: Hormones (Insulin, Thyroxine), Oils and fats (cod-liver oil), Enzymes (Pancreatin, Pepsin), Vaccines (killed, modified or attenuated viruses).
- 20 Human Sources: Streptokinase (from blood), Growth hormones (anterior pituitary), Chorionic gonadotropin (urine of pregnant women).
- 21

Animal Sources

- Hormones
 - Insulin, Thyroxine
- Oils and fats
 - cod-liver oil
- Enzymes
 - Pancreatin, Pepsin
- Vaccines
 - killed, modified or attenuated viruses


Heparin
Ox, Pig



17

>Caffeine (1,3,7-trimethylxanthine) is found in coffee.

>Cocaine
 coca leaf, which is chewed as a stimulant-narcotic



18

> Atropine (Anticholinergic) — from leaves of atropa belladonna.

> Ephedrine (Sympathomimetic) — from plant Ephedra vulgaris

> Scopolamine (Anticholinergic) — from bark of Datura.

> Reserpine (Antiadrenergic) — from roots of Rauwolfia serpentina

19

Animal Sources

- Insulin
 - Islets of Langerhans
- Oils and fats
 - cod liver oil
- Scourings
 - Penicillin, Papain
- Vaccines
 - killed, modified or attenuated strains
 - Mumps
 - Cholera



20

Human Sources

> Immunoglobulins ----- from blood

> Growth hormones ----- anterior pituitary

> Chorionic gonadotropin-- urine of pregnant women

21

Microorganisms

Penicillin from Penicillium notatum

Human Sources

- Immunoglobulins ----- from blood
- Growth hormones ----- anterior pituitary
- Chorionic gonadotropin-- urine of pregnant women

Click to add notes

19

Animal Sources

- Mammals
 - Insulin, Thyroxine
- Oils and fats
 - cod liver oil
- Enzymes
 - Pancreatin, Pepsin
- Testes
 - Vit D₃, modified or unmodified
- Testes
- Vit D₃, modified or unmodified
- Vitamins
- Vitamins



20

Human Sources

- Immunoglobulins ----- from blood
- Clotting substances ----- from plasma
- Chemicals, germicides ----- from various sources

21

Microorganisms

Penicillin from *Penicillium notatum*

- Streptomycin from *Streptomyces griseus*
- Bacitracin from *Bacillus subtilis*
- Diastase from *Aspergillus oryzae*

22

Mineral Sources of Drugs

- Iron (Anemia)
- Aluminium hydroxide (Antacid)
- Iodine (Larger source for thyroxine, smaller source in unrefined)
- Magnesium sulphate (Purgative)
- Sulphur (Sulphur)
- Antimony salts (Kala Arsa)
- Bismuth salts (peptic Ulcer)

23

Semi-Synthetic Drugs

- # Microorganisms
- Penicillin from *Penicillium notatum*.
 - Streptomycin from *Streptomyces griseus*.
 - Bacitracin from *Bacillus subtilis*.
 - Diastase from *Aspergillus oryzae*.

Click to add notes

19

Animal Sources

- **Minerals**
 - **Insulin** - Thyroid
- **Oils and fats**
 - cod liver oil
- **Enzymes**
 - **Paracetamol, Papain**
- **Toxins**
 - **Antid. modified or unmodified**
- **Stigmasterol**
- **Cholein**



20

Human Sources

- **Immunoglobulins** - from blood
- **Clotting factors** - from arterial
- **Chemical preparations** - some of pregnant women

21

Microorganisms

Penicillin from *Penicillium notatum*

- **Streptomycin** from *Streptomyces griseus*
- **Streptomycin** from *Streptomyces griseus*
- **Dioxin** from *Aspergillus niger*

22

Mineral Sources of Drugs

- **Iron (Anemia)**
- **Aluminium hydroxide (Antacid)**
- **Iodine** (Lugol's iodine for thyrotoxicosis, tincture iodine as antiseptic)
- **Magnesium sulphate (Purgative)**
- **Sulphur (Scabies)**
- **Antimony salts (Kala Azar)**
- **Bismuth Salts (peptic Ulcer)**

23

Semi-Synthetic Drugs

Click to add notes

Mineral Sources of Drugs

- **Iron (Anemia)**
- **Aluminum hydroxide (Antacid)**
- **Iodine** (Lugol's iodine for thyrotoxicosis, tincture iodine as antiseptic)
- **Magnesium sulphate (Purgative)**
- **Sulphur (Scabies)**
- **Antimony salts (Kala Azar)**
- **Bismuth Salts (peptic Ulcer)**



21

Microorganisms

- Penicillin from *Penicillium notatum*.
- Streptomycin from *Streptomyces griseus*.
- Neomycin from *Streptomyces* sp.
- Chloramphenicol from *Streptomyces venezuelae*.

22

Mineral Sources of Drugs

- Iron (Anemia)
- Aluminium hydroxide (Antacid)
- Iodine (Used to make thyroxine, a hormone)
- Magnesium sulphate (Purgative)
- Sulphur (Sulpha drugs)
- Salicylic acid (Kola Acids)
- Bismuth Salts (Gastric Ulcers)

23

Semi-Synthetic Drugs

- They are prepared by chemical modification of natural drugs in labs.
- Ampicillin from Penicillin-G.
- Dihydroergotamine from Ergotamine.
- Dihydroemetine from Emetine.

24

Synthetic Drugs

- They are purely prepared by chemical synthesis/reaction in pharmaceutical laboratories.
- Sulphonamides
- Tetracyclines
- Barbiturates
- Benzodiazepines

25

Bio-Synthetic Drugs

- They are prepared by cloning of human DNA.

Semi-Synthetic Drugs

- These are prepared by chemical modification of natural drugs in labs.
 - Ampicillin from Penicillin-G.
 - Dihydroergotamine from Ergotamine.
 - Dihydroemetine from Emetine.

Click to add notes

21

Microorganisms

- Penicillin from *Penicillium notatum*.
- Streptomycin from *Streptomyces griseus*.
- Neomycin from *Streptomyces* sp.
- Chloramphenicol from *Streptomyces venezuelae*.

22

Mineral Sources of Drugs

- Iron (Anemia)
- Aluminium hydroxide (Antacid)
- Iodine (Larger doses for myxoedema, smaller doses as contrast)
- Magnesium sulphate (Purgative)
- Sulphur (Sulphur)
- Salicylic acid (Kala Azar)
- Diammonium Salts (Goutic Ulcer)

23

Semi-Synthetic Drugs

- These are prepared by chemical modification of natural drugs in lab.
- Ampicillin from Penicillin G
- Dihydrostreptomycin from Streptomycin
- Dihydrochloroquin from Quinine

24

Synthetic Drugs

- They are purely prepared by chemical synthesis/alteration in pharmaceutical laboratories.
- Sulphonamides
- Salicylates
- Barbiturates
- Benzodiazepines

25

Bio-Synthetic Drugs

- These are prepared by cloning of human DNA.

Click to add notes

Synthetic Drugs

- They are purely prepared by chemical formulation/alteration in pharmaceutical laboratories.
 - Sulphonamides
 - Salicylates
 - Barbiturates
 - Benzodiazepines.

23

Semi-Synthetic Drugs

- These are prepared by chemical modification of natural drugs in lab.
 - Aspirin from Salicylic acid
 - Dihydroergotamine from Ergotamine
 - Dihydrocodeine from Codeine

24

Synthetic Drugs

- They are purely prepared by chemical synthesis/ synthesis in pharmaceutical laboratories.
 - Sulphonamides
 - Salicylates
 - Barbiturates
 - Benzhexolines

25

Bio-Synthetic Drugs

- These are prepared by cloning of human DNA.
- CLONING means production of identical subjects like parent.
- TECHNIQUE is called Recombinant DNA technology or Genetic Engineering.
 - Human Growth Hormones (Somatom, Somatotropin)
 - Human Interferons, alpha & beta.
 - Tissue plasminogen activator (Alteplase)
 - Human BCG vaccine
 - Human Hepatitis-B Vaccine

26

Recombinant Drugs

- These are drugs produced by means of recombinant DNA technology.
- It is all done with a gene that codes for a specific protein.



27

How a recombinant drug is made --

Bio-Synthetic Drugs

- These are prepared by cloning of human DNA.
- CLONING means production of identical subjects like parent.
- TECHNIQUE is called Recombinant DNA technology or Genetic Engineering.
 - Human Insulins
 - Human Growth Hormones (Somatom, Somatotropin)
 - Human Interferons, alpha & beta.
 - ~~Tissue plasminogen activator (Alteplase)~~
 - Human BCG vaccine.
 - Human Hepatitis-B Vaccine

Click to add notes



23

Semi-Synthetic Drugs

- These are prepared by chemical modification of natural drugs in lab.
 - Aspirin from Salicylic acid
 - Dihydroergotamine from Ergotamine
 - Dihydrocodeine from Codeine

24

Synthetic Drugs

- They are purely prepared by chemical synthesis/chemistry in pharmaceutical laboratories.
 - Tolipramamide
 - Salicylic acid
 - Morphine
 - Benzhexolone

25

Bio-Synthetic Drugs

- These are prepared by cloning of human DNA.
- CLONING means production of identical subjects like parent.
- TECHNIQUE is called Recombinant DNA technology or Genetic Engineering.
 - Human Growth Hormones (Somatrem, Somatotropin)
 - Human Interferons, alpha & beta.
 - Tissue plasminogen activator (Alteplase)
 - Human BCG vaccine
 - Human Hepatitis-B Vaccine

26

Recombinant Drugs

- These are drugs produced by means of recombinant DNA technology
- It is done with a gene that codes for a specific protein



27

How a recombinant drug is made --

Bio-Synthetic Drugs

- These are prepared by cloning of human DNA.
- CLONING means production of identical subjects like parent.
- TECHNIQUE is called Recombinant DNA technology or Genetic Engineering.
 - Human Insulins
 - Human Growth Hormones (Somatrem, Somatotropin)
 - Human Interferons, alpha & beta.
 - Tissue plasminogen activator (Alteplase)
 - Human BCG vaccine.
 - Human Hepatitis-B Vaccine

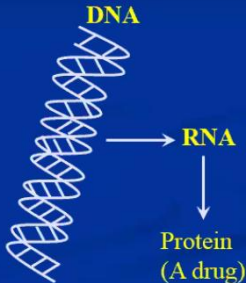
Click to add notes



- 23 **Semi-Synthetic Drugs**
 - These are prepared by chemical modification of natural drugs in lab.
 - Aspirin from Salicylic acid
 - Dihydroergotamine from Ergotamine
 - Dihydrocodeine from Codeine
- 24 **Synthetic Drugs**
 - They are purely prepared by chemical synthesis/ synthesis in pharmaceutical laboratories.
 - Tolipramamide
 - Salicylic acid
 - Morphine
 - Benzhexolone
- 25 **Bio-Synthetic Drugs**
 - These are prepared by cloning of human DNA.
 - CLONING means production of identical copies of the parent.
 - RECOMBINANT DNA technology in Genetic Engineering.
 - Human Insulin
 - Human Growth Hormone (Somatotropin)
 - Human Interferon
 - Human Immunodeficiency Virus (HIV)
 - Tissue plasminogen activator (Alteplase)
 - Human SCF medicine
 - Human Hepatitis-B Vaccine
- 26 **Recombinant Drugs**
 - These are drugs produced by means of recombinant DNA technology.
 - It all starts with a gene that codes for a specific protein.
- 27 **How a recombinant drug is made...**

Recombinant Drugs

- These are drugs produced by means of recombinant DNA technology
- It all starts with a gene that codes for a specific protein
- ...



DNA

↓

RNA

↓

Protein (A drug)

Click to add notes

25 **Bio-Synthetic Drugs**

- These are prepared by cloning of human cDNA.
- CLONING means production of identical copies of the gene.
- TECHNIQUE is called Recombinant DNA technology or Genetic Engineering.
 - Human Insulin
 - Human Growth Hormone (Somatotrophic hormone)
 - Human Interferon, alpha & beta
 - Tissue plasminogen activator (Alteplase)
 - Human BCG vaccine
 - Human Hepatitis B Vaccine

26 **Recombinant Drugs**

- These are drugs produced by means of recombinant DNA technology.
- It is done with a gene that codes for a specific protein.




27 **How a recombinant drug is made -**

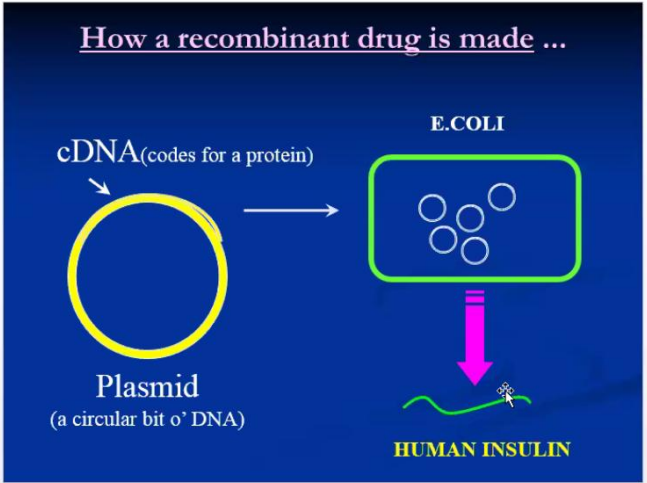


28 **Example of a Recombinant Drug Insulin**

- Most insulin is now recombinant.
- Consists of two chains (A and B).
- A and B chains joined chemically.



29 **Gene Therapy**



Click to add notes


25

Bio-Synthetic Drugs

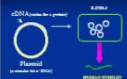
- These are prepared by cloning of human DNA.
- CLONING means production of identical copies of the gene.
- TECHNIQUE is called Recombinant DNA technology or Genetic Engineering.
 - Human Insulin
 - Human Growth Hormone (Somatotrophic)
 - Human Interferon, alpha & beta
 - Tissue plasminogen activator (Alteplase)
 - Human HIV vaccine
 - Human Hepatitis B Vaccine

26

Recombinant Drugs


- These are drugs prepared by means of recombinant DNA technology.
 - It is all starts with a gene that codes for a specific protein.
- 

27

How a recombinant drug is made -

28

Example of a Recombinant Drug
Insulin

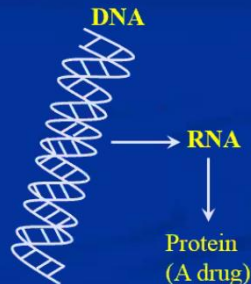
- Most insulin is now recombinant.
 - Consists of two chains (A and B).
 - A and B chains joined chemically.
- 

29

Gene Therapy

Recombinant Drugs

- These are drugs produced by means of recombinant DNA technology
- It all starts with a gene that codes for a specific protein
- ...



Click to add notes




25

Bio-Synthetic Drugs

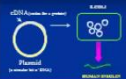
- These are prepared by cloning of human DNA.
- CLONING means production of identical copies of the gene.
- RECOMBINANT is called Recombinant DNA technology or Genetic Engineering.
 - Human Insulin
 - Human Growth Hormone (Somatotropin)
 - Human Interferon, alpha & beta
 - Tissue plasminogen activator (Alteplase)
 - Human HGH analogue
 - Human Hepatitis B Vaccine

26

Recombinant Drugs


- These are drugs produced by means of recombinant DNA technology.
 - It is done with a gene that codes for a specific protein.
- 

27

How a recombinant drug is made -

28

Example of a Recombinant Drug: Insulin

- Most insulin is now recombinant.
 - Consists of two chains (A and B).
 - A and B chains joined chemically.
- 

29

Gene Therapy

Example of a Recombinant Drug: Insulin

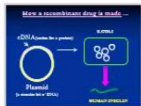
- Most insulin is now recombinant
- Consists of two chains (A and B)
- A and B chains joined chemically



Click to add notes



27



28



29



30



31



Gene Therapy

- It is the introduction of functional genetic material DNA into target cells to replace or supplement defective genes. It imparts new function to cells.
 - Cancers
 - Alzheimer's ds., Sickle Cell Anaemia
 - Parkinsons ds., Dwarfism.
 - Diabetes mellitus, multiple Sclerosis.
 - Hypertension.
 - Viral infections.

Click to add notes



29 **Gene Therapy**

- It is the introduction of functional genes
- replaced DNA into target cells to replace or supplement defective genes. It requires some function to cells.
- Gene
- Meltem A. Saka Cal Jansen
- Dalman A. Derman
- Dalman A. Derman
- Dalman A. Derman
- Dalman A. Derman
- Dalman A. Derman
- Dalman A. Derman

30 **Active principles of Drugs**

31 **What is Drug ?**

What is Medicine ?

32 **Drugs/Medicines**

WHO scientific group has defined a drug as

Any substance or product that is used or intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient

A substance that changes the biological system by interacting with it

33

Click to add notes

What is Drug ?

What is Medicine ?

29

Gene Therapy

- It is the introduction of functional genes
- replaced DNA into target cells to replace or
- supplement defective genes. It targets some
- function in cells.
- Gene
- Muscular D., Sickle Cell Anemia
- Duchenne's D., Downham
- Duchenne's malina, multiple sclerosis
- Hypertension
- Yeast infections

30

Active principles of Drugs

31

What is Drug ?

What is Medicine ?

32

Drugs/Medicines

WHO scientific group has defined a drug as

Any substance or product that is used or intended to
be used to modify or explore physiological systems
or pathological states for the benefit of the recipient

A substance that changes the biological system by
interacting with it

33

Click to add notes

Drugs/Medicines

WHO scientific group has defined a drug as

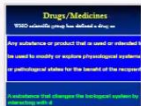
Any substance or product that is used or intended to
be used to modify or explore physiological systems
or pathological states for the benefit of the recipient.

A substance that changes the biological system by
interacting with it

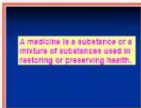
31



32



33



34



35



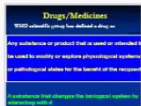
Click to add notes

A medicine is a substance or a mixture of substances used in restoring or preserving health.

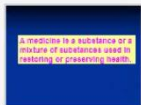
31



32



33



34



35



Click to add notes

Drug vs Medicine?

- A drug is a single chemical substance that forms the active ingredient of a medicine.
- A medicine may contain many other substances to deliver the drug in a stable form, acceptable and convenient to the patient.

33

A medicine is a substance or a mixture of substances used in restoring or preserving health.

34

Drug vs Medicine?

- A drug is a single chemical substance that forms the active ingredients of a medicine.
- A medicine may contain many other substances to deliver the drug in a stable form, absorbable and convenient to the patient.

35

Sources of Drugs

- Naturally occurring
- Modified natural drugs
- Mineral sources
- Microbial sources
- Human sources
- Synthetic sources
- Genetic engineering

36

Active principles of drug

A constituent of a drug, upon the presence of which the characteristic pharmacologic action of the substance largely depends.

37

Examples

Click to add notes

Sources of Drugs

- Naturally occurring
- Modified natural drugs
- Mineral sources
- Microbial sources
- Human sources
- Synthetic sources
- Genetic engineering

33

A medicine is a substance or a mixture of substances used in restoring or preserving health.

34

Drug vs. Medicine?

- A drug is a single chemical substance that forms the active ingredients of a medicine.
- A medicine may contain many other substances to deliver the drug in a stable form, improve its absorption and convenience to the patient.

35

Sources of Drugs

- Naturally occurring
- Modified natural drugs
- Mineral sources
- Microbial sources
- Human sources
- Synthetic sources
- Genetic engineering

36

Active principles of drug

A constituent of a drug, upon the presence of which the characteristic therapeutic action of the substance largely depends.

37

Examples

Active principles of drug

A constituent of a drug, upon the presence of which the characteristic therapeutic action of the substance largely depends.

Click to add notes

35

Sources of Drugs

- Naturally occurring
- Modified natural drugs
- Mineral sources
- Microbial sources
- Human sources
- Synthetic sources
- Genetic engineering

36

Active principles of drug

A constituent of a drug, upon the presence of which the therapeutic pharmacologic action of the substance largely depends.

37

Examples

- Alkaloids
- Glycosides
- Tannins
- Oleo-resins
- Oils
- Gums

38

Active Principles in Plants

39

I. Alkaloids

Examples

- Alkaloids
- Glycosides
- Tannins
- Oleo-resins
- Oils
- Gums

Click to add notes

35

Sources of Drugs

- Naturally occurring
- Modified natural drugs
- Mineral sources
- Microbial sources
- Botanical sources
- Synthetic sources
- Genetic engineering

36

Active principles of drug

A constituent of a drug, upon the presence of which the characteristic pharmacologic action of the substance largely depends.

37

Examples

- Alkaloids
- Glycosides
- Terpenes
- Oleo-resins
- Oils
- Gums

38

Active Principles in Plants

39

1. Alkaloids

Click to add notes

Active Principles in Plants



37

Example s

- > Alkaloids
- > Glycosides
- > Tannins
- > Chloro-phenols
- > Oils
- > Gums

38

*Active Principles
in
Plants*

39

1. Alkaloids

- > organic nitrogenous substances
- > bitter
 - insoluble in water
 - react with acids to form salts
 - salts are soluble in body fluids
- > Examples are
atropine, caffeine, morphine, nicotine, quinine, reserpine, emetine, codeine, tubocurarine.

40

2. Glycosides

- Any compound that contains a carbohydrate molecule (sugar)
- by hydrolysis cleavage, convertible into sugar and a non-sugar component (aglycone)
- > glucoside (glucose)
 - > galactoside (galactose)
 - > fructoside (fructose) etc.

41

EXAMPLE:
Atropine (anticholinergic alkaloid), ...

Click to add notes

1. Alkaloids

- > **organic nitrogenous substances**
- > **bitter**
 - insoluble in water
 - react with acids to form salts
 - salts are soluble in body fluids
- > Examples are
atropine, caffeine, morphine, nicotine, quinine, reserpine, emetine, codeine, tubocurarine.



37

Examples

- > Alkaloids
- > Glycosides
- > Tannins
- > Oleo-resins
- > Oils
- > Gums

38

*Active Principles
in
Plants*

39

1. Alkaloids

- > Organic nitrogenous substances
- > bitter
 - insoluble in water
 - react with acids to form salts
 - salts are soluble in body fluids
- > Examples are:
 - Atropine, caffeine, cocaine, quinine, reserpine, strychnine, veratrine, tubocurarine.

40

2. Glycosides

- Any compound that contains a carbohydrate molecule (sugar)
- by hydrolytic cleavage, convertible into sugar and a nonsugar component (aglycone)
- > glucoside (glucose),
- > pentoside (pentose),
- > fructoside (fructose) etc

41

EXAMPLE:

in Fibrous (cellulose, lignin, hemicellulose, pectin)

2. Glycosides

Any compound that contains a carbohydrate molecule (sugar)

by hydrolytic cleavage, convertible into sugar and a nonsugar component (aglycone)

- glucoside (glucose),
- pentoside (pentose),
- fructoside (fructose) etc

Click to add notes

39

1. Alkaloids

- organic nitrogenous substances
- bitter
 - insoluble in water
 - react with acids to form salts
 - salts are soluble in body fluids
- Examples are
 - atropine, caffeine, cocaine, quinine, strychnine, nicotine, ephedrine, theobromine, theophylline, etc.

40

2. Glycosides

Any compound that contains a carbohydrate molecule (sugar) by hydrolytic cleavage, convertible into sugar and a non-sugar component (aglycone)

- glycoside (glucose)
- peroxide (carbamate)
- fructoside (fructose) etc

41

EXAMPLE:

- Digoxin (cardiac stimulant) — leaves of digitalis purpurea or digitalis lanata
- Anthraquinone glycosides (laxative action) — senna, cascara, aloe

42

3. Oils

- Fixed oils
- Volatile oils
- Mineral oils

43

Fixed oils

• Esters of fatty acid and glycerol

Click to add notes

EXAMPLE:

❖ Digoxin (cardiac stimulant) --- leaves of digitalis purpurea or digitalis lanata

❖ Anthraquinone glycosides (laxative action) ----- senna, cascara, aloe

39

1. Alkaloids

- > organic nitrogenous substances
- > bitter
 - insoluble in water
 - react with acids to form salts
 - salts are soluble in body fluids
- > Examples are
 - Atropine, caffeine, cocaine, nicotine, quinine, reserpine, strychnine, scopolamine, tubocurarine.

40

2. Glycosides

Any compound that contains a carbohydrate molecule (sugar)

by hydrolysis liberate, convertible into sugar and a non-sugar component (aglycone)

- > glycoside (chemical)
- > peroxide (chemical)
- > fructoside (fructose) etc

41

EXAMPLE:

- Digoxin (cardio-stimulant) — leaves of digitalis purpurea or digitalis lanata
- Anthraquinone glycosides (laxative action) — senna, cascara, etc

42

3. Oils

- Fixed oils
- Volatile oils
- Mineral oils

43

Fixed oils

• Esters of fatty acid and glycerol

Slides

Font

Paragraph

Drawing

3. Oils

- Fixed oils
- Volatile oils
- Mineral oils

Click to add notes

- 41
- 42
- 43
- 44
- 45

EXAMPLES:
 » Digoxin (*cardiac glycoside*) — leaves of *digitalis purpurea* or *digitalis lanata*
 » Anthraquinone glycosides (*laxative action*) — *senna, cascara, aloë*

3. Oils

- Fixed oils
- Volatile oils
- Mineral oils

Fixed oils

- Esters of fatty acid and glycerol
- Edible

Examples

- Coconut oil
- Mustard oil
- Olive oil
- Castor oil (Purgative)
- Cod liver oil (Vitamin A & D)

Used in the preparation of ointments, suppositories, soaps

Volatile Oils

Essential or aromatic oils

CHARACTERISTICS:

- LIQUID
- Color of (various)
- Constituents of
- Castor oil
- Oil of
- Sassafras oil (Carminative)
- Thymus oil (antiseptic)

SOLUBILITY:

- Insoluble
- Soluble
- Miscible

Mineral Oil

Fixed oils

- Esters of fatty acid and glycerol
- Edible

Examples

- Coconut oil
- Mustard oil
- Olive oil
- Castor oil (Purgative)
- Cod liver oil (Vitamin A & D)
- Used in the preparation of ointments, suppositories, Soaps

Click to add notes

41

EXAMPLES:

- » Digoxin (*cardiac glycoside*) — leaves of *digitalis purpurea* or *digitalis lanata*
- » Anthraquinone glycosides (*laxative action*) — *senna, cascara, aloë*

42

3. Oils

- Fixed oils
- Volatile oils
- Mineral oils

43

Fixed oils

- Esters of fatty acid and glycerol
- Edible
- Examples:
 - Coconut oil
 - Mustard oil
 - Olive oil
 - Castor oil (Purgative)
 - Cod liver oil (Vitamins A & D)
- Used in the preparation of ointments, suppositories, soaps

44

Volatile Oils

Essential or Flavoring oils

EXAMPLES:

LIQUID

- Clove oil (toothache)
- Eucalyptus oil
- Coriander oil
- Dill oil
- Ginger oil (Carminative)
- Turpentine oil (counter irritant)

SOLIDS

- Camphor
- Menthol (peppermint oil)

45

Mineral Oil

Click to add notes

Volatile Oils

Essential or flavoring oils.

EXAMPLES:

LIQUID

Clove oil (toothache)

Eucalyptus oil

Coriander oil

Dill oil

Ginger oil (Carminative)

Turpentine oil (counter irritant)

SOLIDS

Camphor

Menthol (peppermint oil)

43

Fixed oils

- Esters of fatty acid and glycerol
- edible

Examples:

- Coconut oil
- Mustard oil
- Olive oil
- Castor oil (Purgative)
- Cod liver oil (Vitamin A & D)
- Used in the preparation of ointments, suppositories, soaps

44

Volatile Oils

Essential or aromatic oils.

EXAMPLES:

- LIQUID
 - Clove oil (anesthetic)
 - Eucalyptus oil
 - Camphor oil
 - Peppermint
 - Rose oil (perfumery)
 - Turpentine oil (resinous turpentine)
- SOLID
 - Camphor
 - Menthol (resinous oil)

45

Mineral Oil

Hydrocarbon

Obtained from petroleum

EXAMPLE: Liquid paraffin (Lubricant & Laxative)

46

4. RESINS

A viscous hydrocarbon secretion of many plants used in varnishes

Oxidation or polymerization of volatile oils. Amorphous, brittle, translucent, hard solids

Example:

- Polychlorine (Purgative Action)
- Jellol (Hydrogel)

Mineral Oil

Hydrocarbon

Obtained from petroleum

EXAMPLE: Liquid paraffin (Lubricant & Laxative)

Click to add notes

43

Fixed oils

- Esters of fatty acid and glycerol
- Edible

Examples

- Coconut oil
- Mustard oil
- Olive oil
- Castor oil (Purgative)
- Cod liver oil (Vitamins A & D)
- Used in the preparation of ointments, suppositories, soaps

44

Volatile Oils

Essential or Scenting oil

EXAMPLES:

LIQUID

- Clove oil (Anesthetics)
- Camphor oil
- Eucalyptus oil
- Oil of
- Wintergreen oil (Analgesic)
- Peppermint oil (Antispasmodic)

SOLID

- Camphor
- Menthol (Antispasmodic)

45

Mineral Oil

Hydrocarbon

Obtained from petroleum

EXAMPLES: Liquid paraffin (Lubricant & Laxative)

46

4. RESINS

A viscous hydrocarbon secretion of many plants used in varnishes

Oxidation or polymerization of volatile oils

Amorphous, brittle, translucent, hard solids

Example:

Podophyllum (Purgative action),
Jalap (Hydragogue)

47

5. OLIORESINS

Click to add notes

4. RESINS

A viscous hydrocarbon secretion of many plants used in varnishes

Oxidation or polymerization of volatile oils
Amorphous, brittle, translucent, hard solids

Example:

**Podophyllum (Purgative action),
Jalap (Hydragogue)**

45

Mineral Oil

Hydrocarbon
Obtained from petroleum
EXAMPLE: Liquid paraffin (Lubricant & Laxative)

46

4. RESINS

A viscous hydrocarbon secretion of many plants used in varnishes

Oxidation or polymerization of volatile oils
Amorphous, brittle, translucent, hard solids

Example:
Podophyllum (Purgative action),
Jalap (Hydragogue)

47

5. OLIORESINS

Mixtures of resins & volatile oils

Example:
Benzoin (Antiseptic)

48

6. GUMS

Resin ————— emulsifying agents: Gum acacia, Gum Tragacanth

Active ————— Resin
Piper (Purgative)

49

7. TANNINS

Click to add notes

5. OLIORESINS

Mixtures of resins & volatile oils

Example:

Benzoin (Antiseptic)

45

Mineral Oil

Hydrocarbon
Obtained from petroleum
EXAMPLE: Liquid paraffin (Lubricant & Laxative)

46

4. RESINS

A viscous hydrocarbon secretion of many plants used in varnishes

Oxidation or polymerization of volatile oils
Amorphous, brittle, translucent, hard solids

Example:
Podagryllus (Purgative action),
Jalap (Hydragogue)

47

5. OLIORESINS

Mixtures of resins & volatile oils

Example:
Benzoin (Antiseptic)

48

6. GUMS

Inert ----- emulsifying agents -Gum acacia,
Gum tragacanth

Active ----- Agar
(Purgative)

49

7. TANNINS

Click to add notes

6. GUMS

Inert ----- emulsifying agents -Gum acacia,
Gum tragacanth

Active ----- Agar
(Purgative)

Clipboard
Podophyllum (Purgative action),
Lalap (Hydragogue)

47

5. OLIORESINS
Mixtures of resins & volatile oils
Example:
Benzoin (Antiseptic)

48

6. GUMS
Inert ————— emulsifying agents — Glucosides, Gum tragacanth
Active ————— Rhat (Purgative)

49

7. TANNINS
> Mixture of esters of Gallic acid + Glucose
> Astringent action on mucus membrane
> Hemostatic

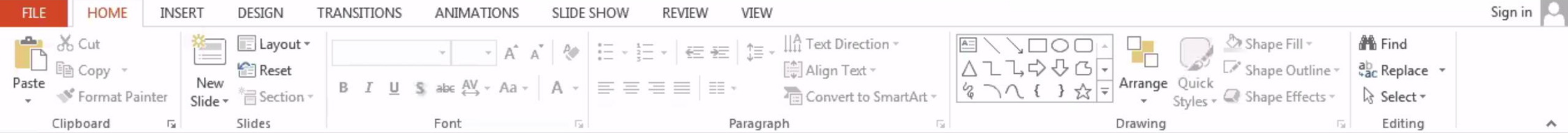
50

Classification of drugs
• Classes of different ions
1. Pharmacological and drug classification
- Antiparasitic
- Anti-inflammatory
- Anti-infective
- Anticancer
- Anticoagulant
- Antidiabetic
- Antihypertensive
- Antipsychotic
- Antidepressant
- Antiepileptic
- Antifungal
- Antiviral
- Cardiac
- Chemotherapy
- Diuretic
- Hormonal
- Immunomodulatory
- Neuroleptic
- Sedative
- Stimulant
- Vasodilator
- Vitamin
- Zoonotic

Click to add notes

7. TANNINS

- Mixture of esters of Gallic acid + Glucose
- Astringent action on mucus membrane
- Hemostatic



- 47 5. OLIORESINS
Mixtures of resins & volatile oils
Example:
Benzoin (Antiseptic)
- 48 6. GUMS
Inert — emulsifying agents— Gum acacia, Gum tragacanth
Active — Agar (Purgative)
- 49 7. TANNINS
> Mixture of esters of Gallic acid + Glucose
> Astringent action on mucus membrane
> Hemostatic
- 50 Classification of drugs
Classified on different basis
1. Pharmacological and therapeutic classification
Analgesics— aspirin
Anti hypertensives— ACE inhibitors
Anti parkinsonian drugs— levodopa
Diuretics— Thiazide group
2. Based on Mechanism of action
Enzyme inhibitors e.g
MAO inhibitors (antidepressant)
Xanthine Oxidase inhibitors (Allupurinol)
Carbonic anhydrase inhibitors (Acetazolamide)
- 51

Classification of drugs

- Classified on different basis
- 1. Pharmacological and therapeutic classification
 - Analgesics— aspirin
 - Anti hypertensives— ACE inhibitors
 - Anti parkinsonian drugs— levodopa
 - Diuretics— Thiazide groups
- 2. Based on Mechanism of actions
 - Enzyme inhibitors e.g
 - MAO inhibitors (antidepressant)
 - Xanthine Oxidase inhibitors (Allupurinol)
 - Carbonic anhydrase inhibitors (Acetazolamide)

FILE HOME INSERT DESIGN TRANSITIONS ANIMATIONS SLIDE SHOW REVIEW VIEW

Clipboard Slides Font Paragraph Drawing Editing

- 49 7. TANNINS
 - > Mixture of esters of Gallic acid + Glucose
 - > Astringent action on mucus membrane
 - > Hemostatic
- 50 Classification of drugs
 - Classified on different basis
 - 1. Pharmacological and therapeutic classification
 - Analgesics
 - Anti hypertensive-ACE inhibitors
 - Anti gastritis drug-antacids
 - Diuretics-Thiazide group
 - 2. Based on Mechanism of action
 - Enzyme inhibitors e.g. MAO inhibitors (antidepressant)
 - Specific enzyme inhibitors (Allopurinol)
 - Carbonic anhydrase inhibitors (acetazolamide)
- 51 3. Enhancing or blocking effects of neurotransmitters and receptors
 - Dopaminergic drugs (stimulate dopamine receptors)
 - Beta blockers (block beta receptors)
 - Anticholinesterases (enhance the effect of ACH)
- 52 Sources of Drug Information
 - The United States Pharmacopoeia (USP) and National Formulary (NF)
 - Physician's Desk Reference (PDR)
 - Drug Facts and Comparisons
 - Textbooks
 - Journal
 - Continuing medical education programs
 - Drug company representatives
 - Advertisements (medical, pharmaceutical journals)
 - Internet
- 53

3. Enhancing or blocking effects of neurotransmitters and receptors

Dopaminergic drugs (stimulate dopamine receptors)

Beta blockers (block beta receptors)

Anticholinesterases (enhance the effect of ACH)

4. Based on physiological effects

Vasodilators (nitroprusside, diazoxide)

Bronchodilators (aminophylline, salbutamol)

Anticoagulants (heparin)

5. Based on structure and molecular configurations

Alkaloids, antihistamine, antiserotonin.