

Sources of Drugs

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Sources of Drugs

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graph TD; A[Sources of Drugs] --> B[Natural]; A --> C[Synthetic]; B --> B1[✓ Plants]; B --> B2[✓ Animals]; B --> B3[✓ Microorganisms]; B --> B4[✓ Minerals]; C --> C1[✓ Synthetic]; C --> C2[✓ Semisynthetic]; C --> C3[✓ Gene therapy]; C --> C4[✓ Biopharmaceuticals];
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Natural

- ✓ Plants
- ✓ Animals
- ✓ Microorganisms
- ✓ Minerals

Synthetic

- ✓ Synthetic
- ✓ Semisynthetic
- ✓ Gene therapy
- ✓ Biopharmaceuticals

Plant Sources

- The **ancient** or **original sources** of drugs are the plants collectively known as medicinal plants. **All parts of the medicinal plants** have therapeutic values.

Root	:	Sarpgandha
Rhizome	:	Ginger, Haldi
Bark	:	Cinchona, Catechu, Acacia
Leaves	:	Atropine, Cocaine, Physostigmine
Flowers	:	Digitalis, Chrysanthemum
Fruits	:	Papaya, Anise
Seeds	:	Nux vomica, Kali mirchi, Methi

Root



Rauwolfia serpentina (Sarpgandha)

Rhizome



Curcuma longa (Curcumin)



Zingiber officinale (Ginger)

Bark



**Cinchona officinalis
(Quinine)**



**Acacia catechu
(Catechu)**

Leaves



**Atropa belladonna
(Atropine)**



**Erythroxylum coca
(Cocaine)**

Flowers



**Digitalis purpurea
(Digitalis)**



**Chrysanthemum cinerarifolium
(Pyrethrum)**

Fruits



**Carica papaya
(Papain)**



**Pimpinella anisum
(Anise)**

Seeds



Strychnos nux vomica **Trigonella foenum graecum**
(Strychnine) **(Methi)**

Animal Sources

- Hormones** : Oxytocin, Insulin, Thyroxine,
Gonadotrophins
- Vitamins** : Cod or shark liver oil (Rich sources of
Vitamin A & D)
- Antisera** : Antisnake venom, Canine distemper
antiserum etc.
- Others** : Heparin, Liver extract,
Immunoglobulins, Blood/Plasma.

Microbial Sources

- Fungi/ Actinomycetes** : Sources of antibiotics (penicillin, streptomycin, and Bacteria gentamicin, neomycin etc.)
- Viruses/ Bacteria** : Preparation of vaccines
- Yeasts** : Dried yeast as source of Vitamin B-complex

Mineral Sources

Antacid	:	Magnesium oxide, Sodium bicarbonate
Purgative	:	Magnesium sulphate
Expectorant	:	Potassium iodide
Diuretic	:	Potassium nitrate
Haematinic	:	Ferrous sulphate
Hypothyroidism	:	Iodine
Mineral oils	:	Liquid paraffin

Synthetic Sources

Majority of the current day drugs are from synthetic source.

Antipyretics

Barbiturates

Tranquillizers

Anti-inflammatory drugs

Anaesthetics

Antiseptics

Antiprotozoals

Antihistamines etc.

Semi-Synthetic Sources

- Agonists and antagonists of morphine
- Dihydrostreptomycin - from streptomycin
- Semi-synthetic penicillins - from penicillin.

Gene Therapy

- It means prevention or treatment of disease through manipulation of gene function.
- It is insertion of specific genes (therapeutic genes) exogenously into the animal cells.
- In contrast to all other drugs, this kind of therapy can impart new functions to a cell.
- Recombinant DNA technology forms the basis of synthesis of therapeutic genes.

Gene Therapy

contd...

Applications of gene therapy:

- Cystic fibrosis
- Severe combined immunodeficiency disease (SCID)
- Growth hormone deficiency
- Parkinsonism
- HIV infection
- Alzheimer's disease
- Huntington's chorea
- Cancers
- Hypertension
- Haemophilia
- Insulin dependent diabetes etc.

Biopharmaceuticals

- Functional human peptides:

ADH, Oxytocin, GnRH, ACTH, TSH/TRH,
Calcitonin, Insulin, Somatostatin, Growth
hormone, Cyclosporin etc.

- Enzymes/ Peptides :

Streptokinase, Asparaginase, DNAase,
Erythropoietin, Clotting factors, Interferons,
Monoclonal antibodies, Vaccines etc.

Thank You

