

# PHARMACOLOGY

- Science that deals with study of drugs and their interaction with the living system
- Greek word-Pharmacon-drug, logos- Science
- Science which deals with mechanism of action, therapeutic uses, adverse effects and fate of a drug in a living being

- Ancient times-animal and plant products
- No written information on remedies used
- Indian and Chinese-oldest written material in medicine
- India's earliest pharmacological writing-Vedas, Rigveda
- Ancient Indian physicians- Charaka, Sushruta, Vegbhata-herbal preparations in Ayurveda
- Chinese materia medica-classification of medicinal plants
- Egyptian medical papyri lists 800 preparations

The 4 Vedas Com



॥ यजुर्वेद ॥  
॥ सामवेद ॥  
॥ अथर्ववेद ॥

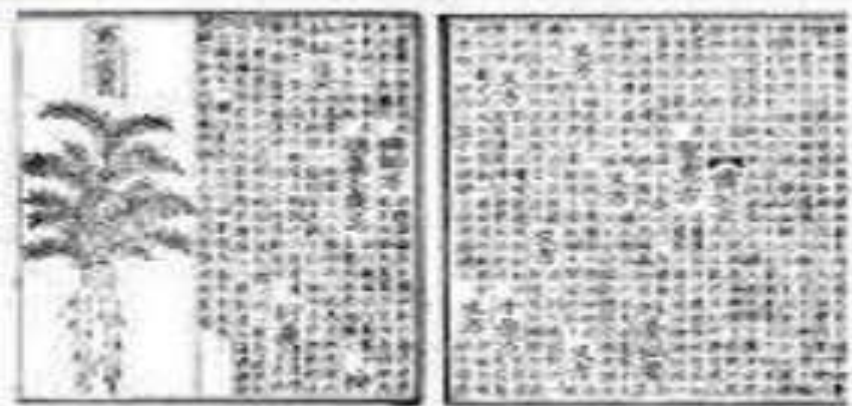
# Vagbhata ॐ



# Chinese & Egyptian

1500 BC

2500 BC



PAN TSAO-CHINESE  
MATERIA MEDICA



EBERS PAPYRUS-EGYPTIAN  
MATERIA MEDICA

- Hippocrates-Greek physician-Father of modern medicine -cause of disease, ethics of medicine, judicious use of drugs
- Attempt to separate the practice of medicine from religion and superstitions



- Galen—Greek physician-Diseases are due to imbalance of fluids
- Drugs had properties-warmth, coldness dryness.....,beneficial to use combination of drug



- Paracelsus-Grand father of pharmacology-All drugs are poisonous



- Traditional systems of medicine practiced in different parts of world-Homeopathy, Ayurveda, Unani, Siddha, Allopathy
- Use of animal experiments to understand the effects of drugs
- Methods of Isolation of drugs



- Rudolph Bucheim -lab-Research of drugs
- founded the first institute of pharmacology at the university of Dorpat (Tartu, Estonia) in 1847.



*Rudolph Bucheim*

- Oswald Schmiedberg(1838-1891)- extensive research on drugs, wrote a medical book-**Father of Pharmacology**
- Concepts such as structure-activity relationship, drug receptor, and selective toxicity emerged

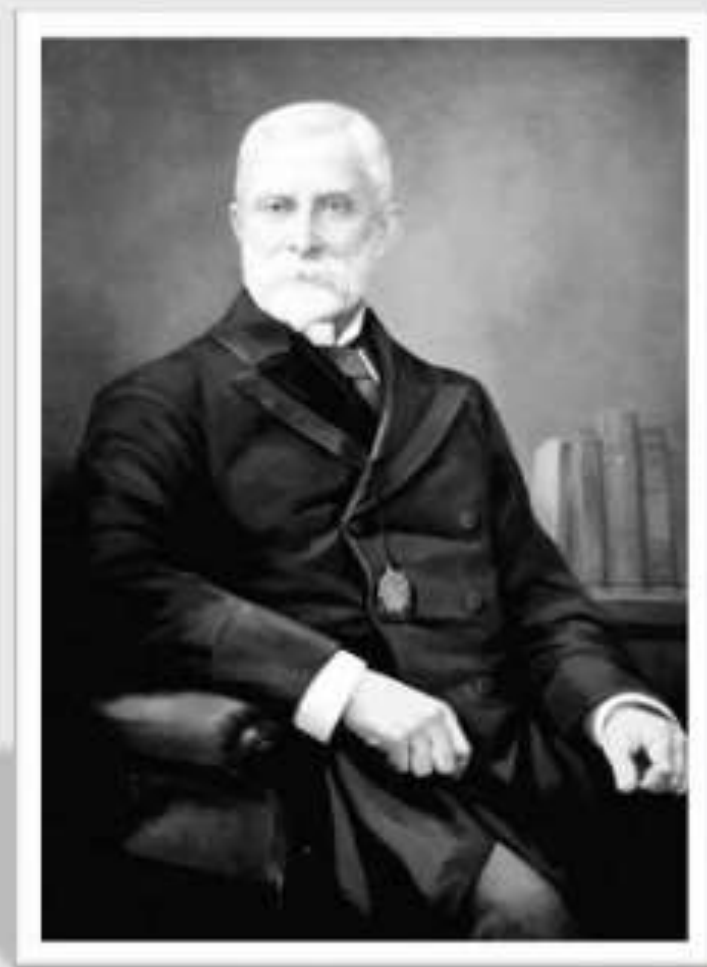


- Evidence based medicine

☞ **Sir Thomas Lauder  
Brunton** (1844 -1916)

☞ Scottish physician

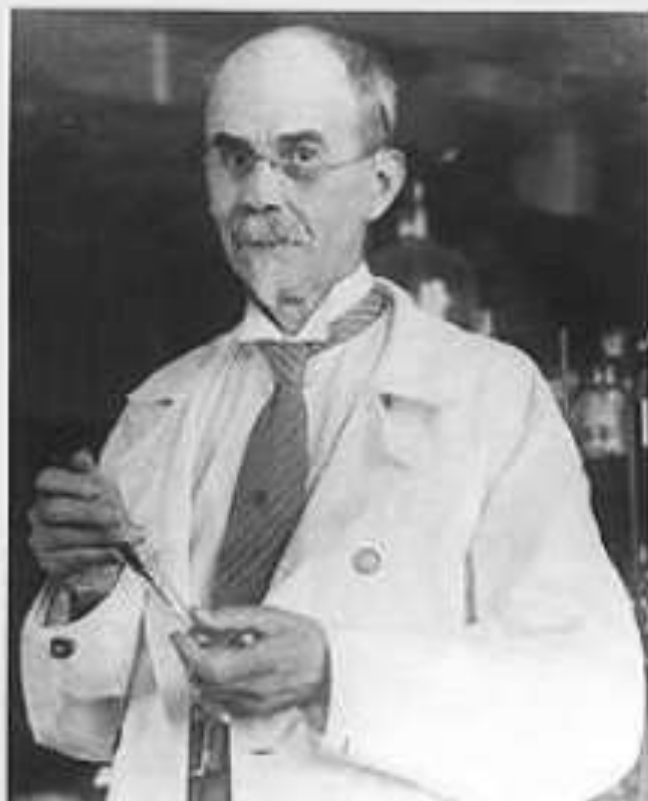
☞ “Textbook of  
Pharmacology,  
Therapeutics and  
Materia Medica (1885)”.



☞ **John Jacob Abel** (1857–1938)

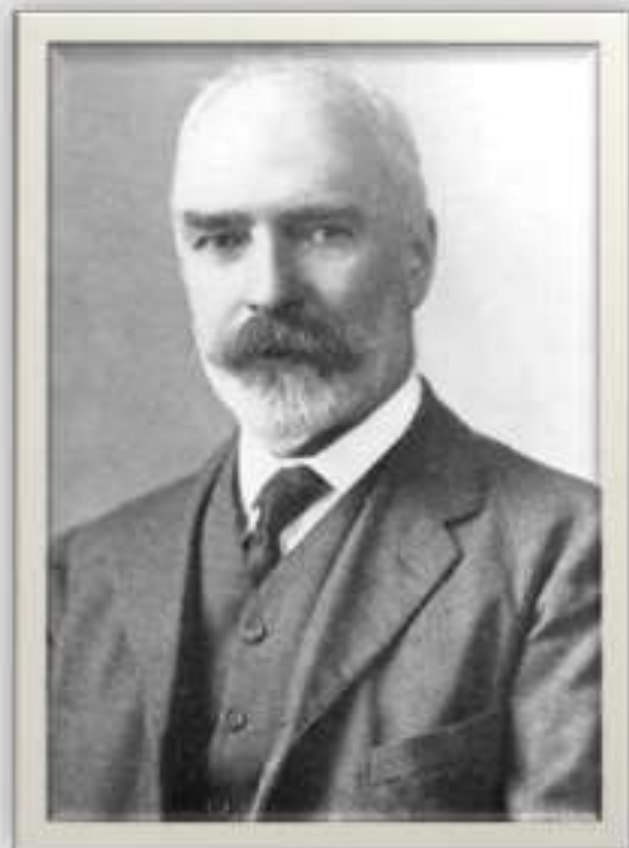
☞ **Father of American Pharmacology.**

☞ **Co-founded Journal of Pharmacology and Experimental Therapeutics in 1909.**



☞ **Arthur Robertson  
Cushny (1866-1926)**

- ☞ Trained by Oswald Schmiedeberg.
- ☞ “Text-Book of Pharmacology and Therapeutics”



## Ram Nanth Chopra-Father of Indian Pharmacology

He was the first to establish a center of study and research in pharmacology in India, at the Calcutta school of Tropical Medicine

Rauwolfia serpentina

CDRI



- Yellapragada Subbarow
- **Indian biochemist** who discovered the function of adenosine triphosphate as an energy source in the cell and developed Methotrexate for the treatment of cancer



- **Drug**: it is the single active chemical entity present in a medicine that is used for diagnosis ,prevention ,treatment / cure of disease .  
OR
- WHO Definition-Drug is any substance / product that is used / intended to be used to modify / explore physiological system / pathological state for the benefit of the recipient .
- Two main divisions of pharmacology

**Pharmacokinetics** : study of movement of a drug in our body, it includes – absorption ,distribution , metabolism and excretion.  
**OR** What the body does to the drug.

**Pharmacodynamics** : this includes physiological and biochemical effects of drugs and their mechanism of action.  
**OR** What the drug does to the body.



- **Pharmacoeconomics** : which is the analysis of cost of the drug therapy to the health care system and the society
- **Pharmacoepidemiology**: which is the study of useful and adverse effects of drugs in large number of people in community.
- **Pharmacovigilance**-epidemiologic study of adverse drug effects.
- **Toxicology** : it is the study of poisonous effects of drugs and other chemicals with emphasis on detection , prevention and treatment of poisoning.

- **Chemotherapy**—use of drugs and chemicals for treatment of infections ,malignancies
- **Pharmacopoeia** : it is an official book containing a list of drugs and medicinal preparations approved for their use.-source, physical properties, doses, tests for identity, purity and potency of drugs

eg. Indian Pharmacopoeia (IP),  
British pharmacopoeia (BP),  
United State pharmacopoeia (USP)  
International pharmacopoeia-WHO

- **Pharmacy** : it is the science of identification, compounding and dispensing drugs.  
It includes collection, identification, purification, isolation, synthesis, standardization and quality control of medicinal substances.
- **Chronopharmacology-**  
Science that involves correlation of drug effects to the circadian rhythm to obtain optimum therapeutic effect and minimize adverse effects

- **Pharmacogenetics**-deals with use of genetic information to guide the choice of drugs in a person. Tailor the drug and dose based on genotype of a person
- **Pharmacogenomics**- Pharmaceutical production of drugs utilizing advanced techniques from Genetic science.

## Textbooks

- Medical pharmacology-fourth edition-Padmaja Udaykumar
- Essentials of Medical Pharmacology-Eighth edition -KD Tripathi
- Principles of Pharmacology-third edition-HL Sharma, KK Sharma
- Pharmacology And Pharmacotherapeutics  
RS Satoskar, Nirmala Rege, SD Bhandarkar-24th Edition
- **Reference books**
- The Pharmacological Basis of Therapeutics- Goodman and Gilman, Twelfth edition
- Rang & Dale's Pharmacology 8<sup>th</sup> Edition
- Bennett and Brown pharmacology- 11<sup>th</sup> Edition
- Katzung- Basic & Clinical Pharmacology 13<sup>th</sup> Edition

- 2 term end exams-theory 50 marks, practical -40 marks
- Theory
  - MCQs-10 marks-20
  - SAQs- 28 marks-7-4 marks each
  - LAQs-12 marks -2-6marks each
- Practical
  - Viva, Table work, Spots
- Prelim -2 papers-40marks each
  - Practical-40 marks
- Journal marks- 3