

SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai

Approved by Pharmacy Council of India, New Delhi.

Coimbatore -641035

COURSE NAME : PHARMACOGNOSY AND PHYTOCHEMISTRY II (BP504T)

V SEM / IIIYEAR

TOPIC 1 : ALKALOIDS

Understanding Alkaloids



Alkaloid Etymology and History

Who coined the term "Alkaloid"?

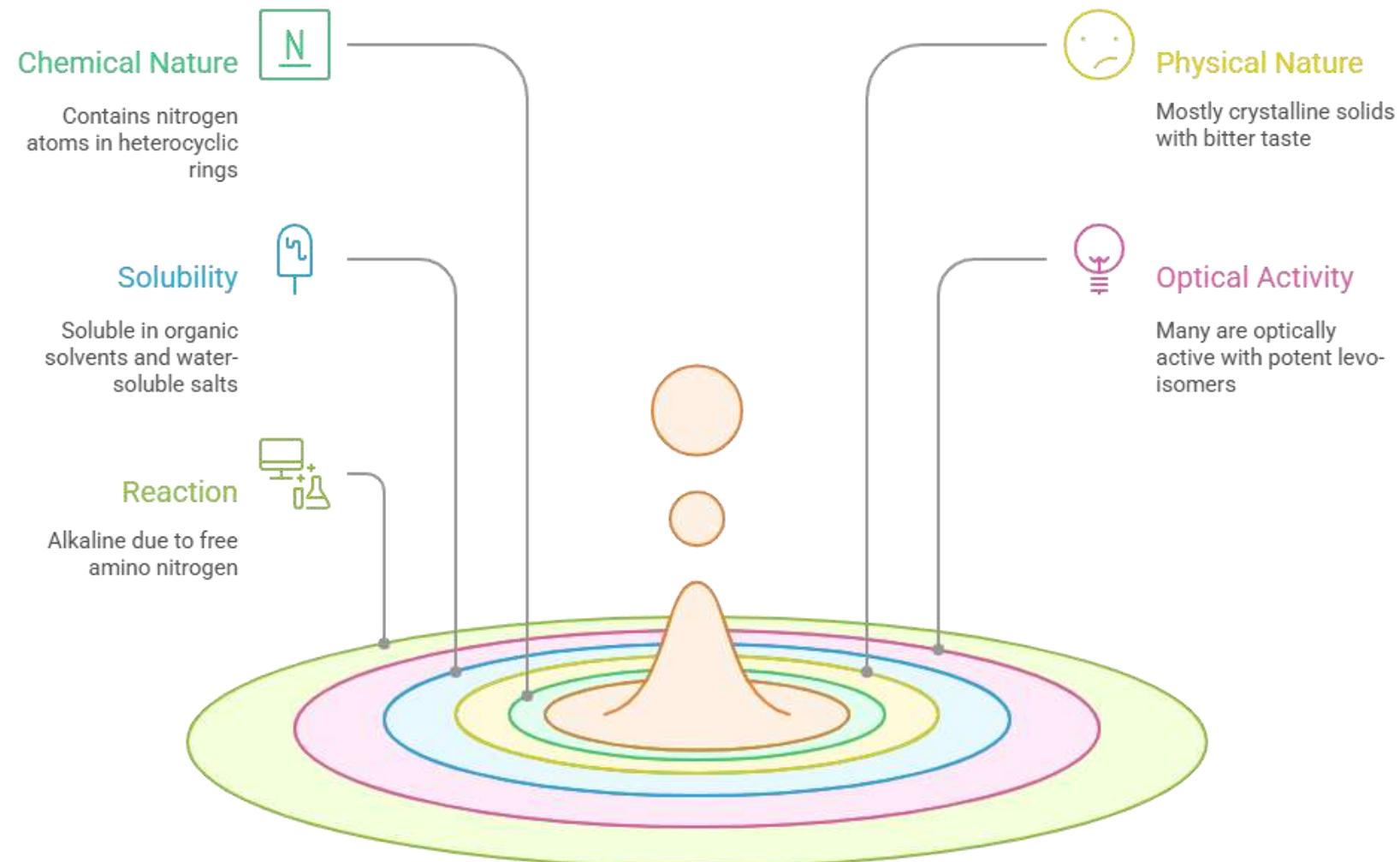
Carl F. W. Meissner in 1819, from "alkali-like".

What was the first alkaloid isolated?

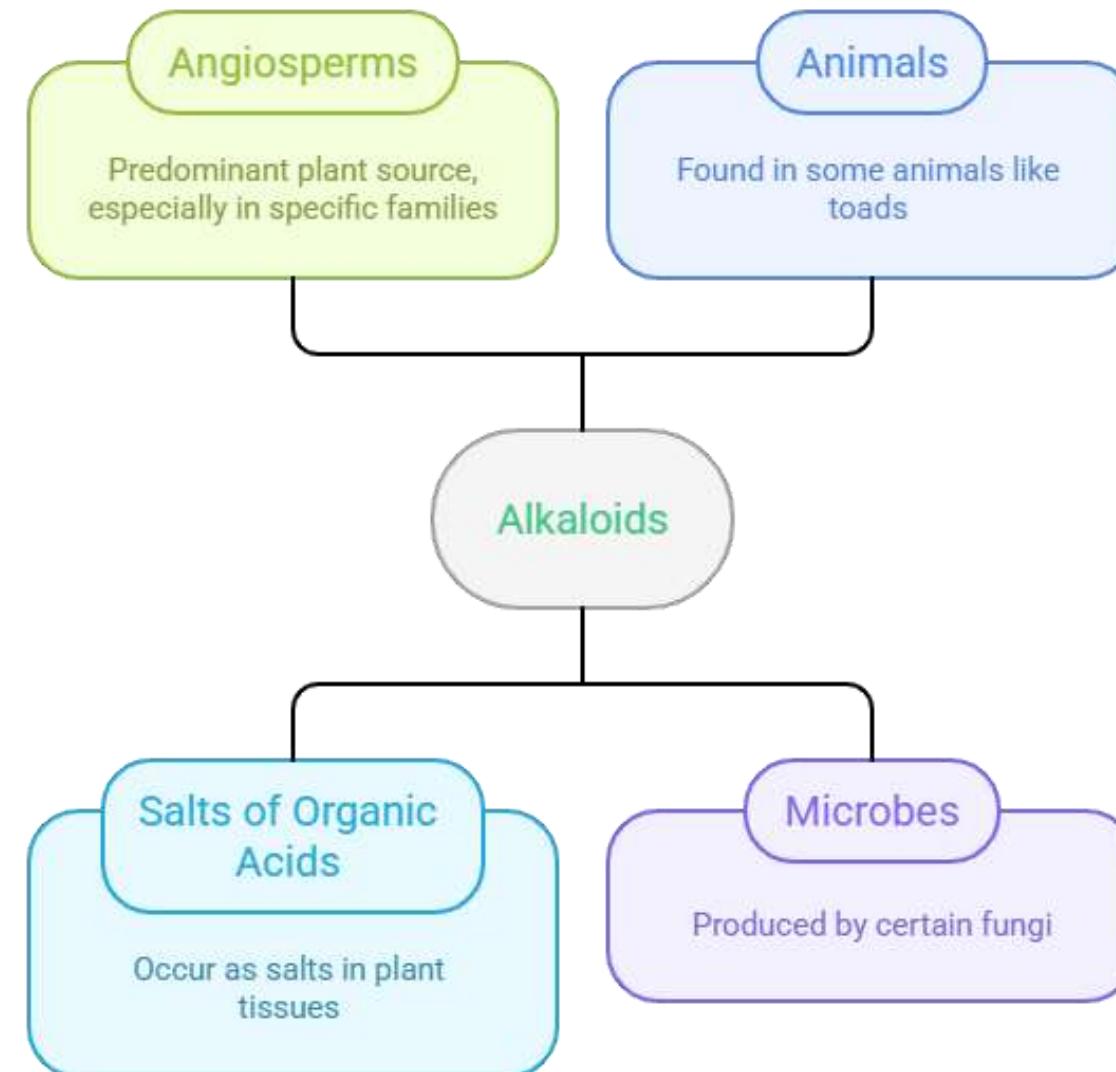
Morphine by Friedrich Sertürner in 1805 from *Papaver somniferum*.



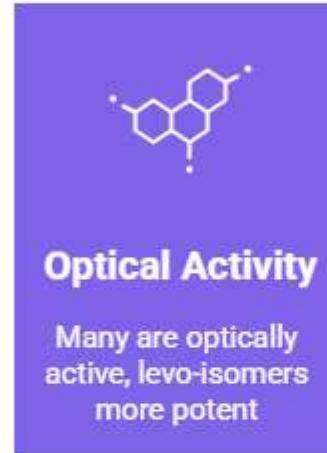
Alkaloid Properties



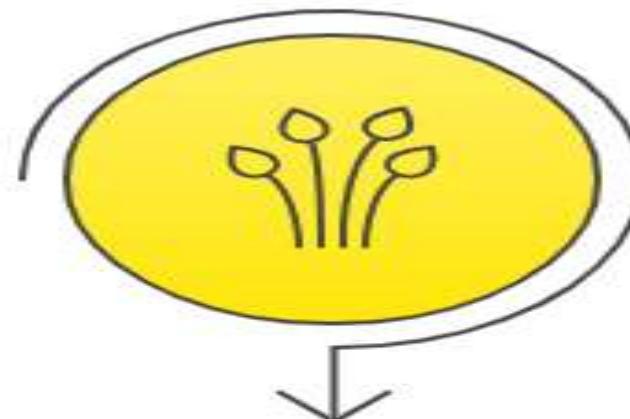
Natural Sources of Alkaloids



What are the characteristics of alkaloids?

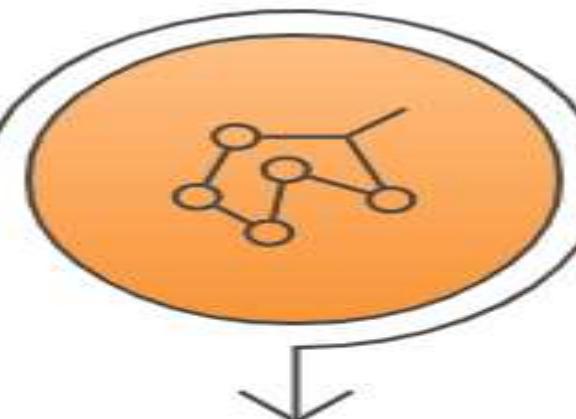


Alkaloid Occurrence



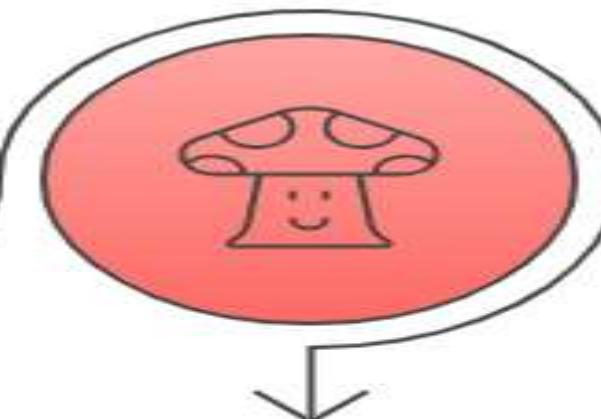
Angiosperms

Alkaloids are mainly found in angiosperms, especially in certain plant families.



Organic Salts

They occur as salts of organic acids in various plant parts.



Animals and Microbes

Alkaloids are sometimes found in animals and microbes.

Biological Role of Alkaloids in Plants

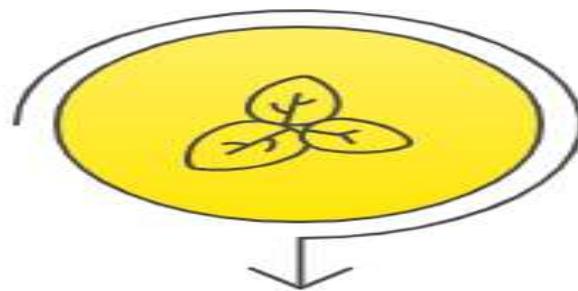


What is the biological role of alkaloids in plants?

They serve as defensive substances, function as end products of nitrogen metabolism, and play a role in growth regulation.

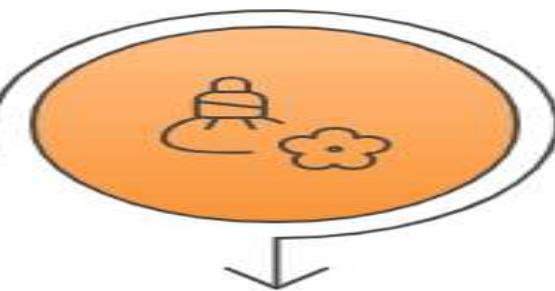


Alkaloid Classification



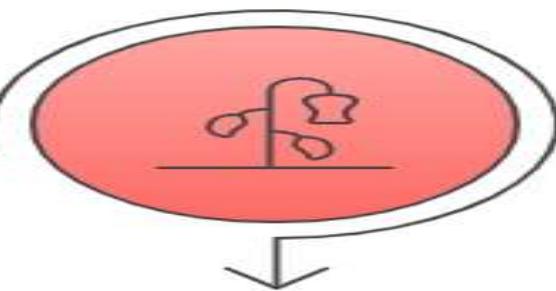
Tryptophan

Tryptophan is a precursor to indole alkaloids found in Vinca and Rauwolfia.



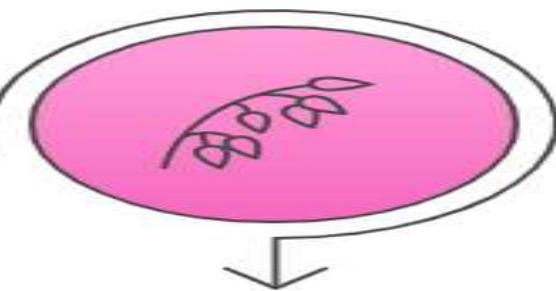
Tyrosine

Tyrosine is a precursor to isoquinoline alkaloids found in opium.



Ornithine

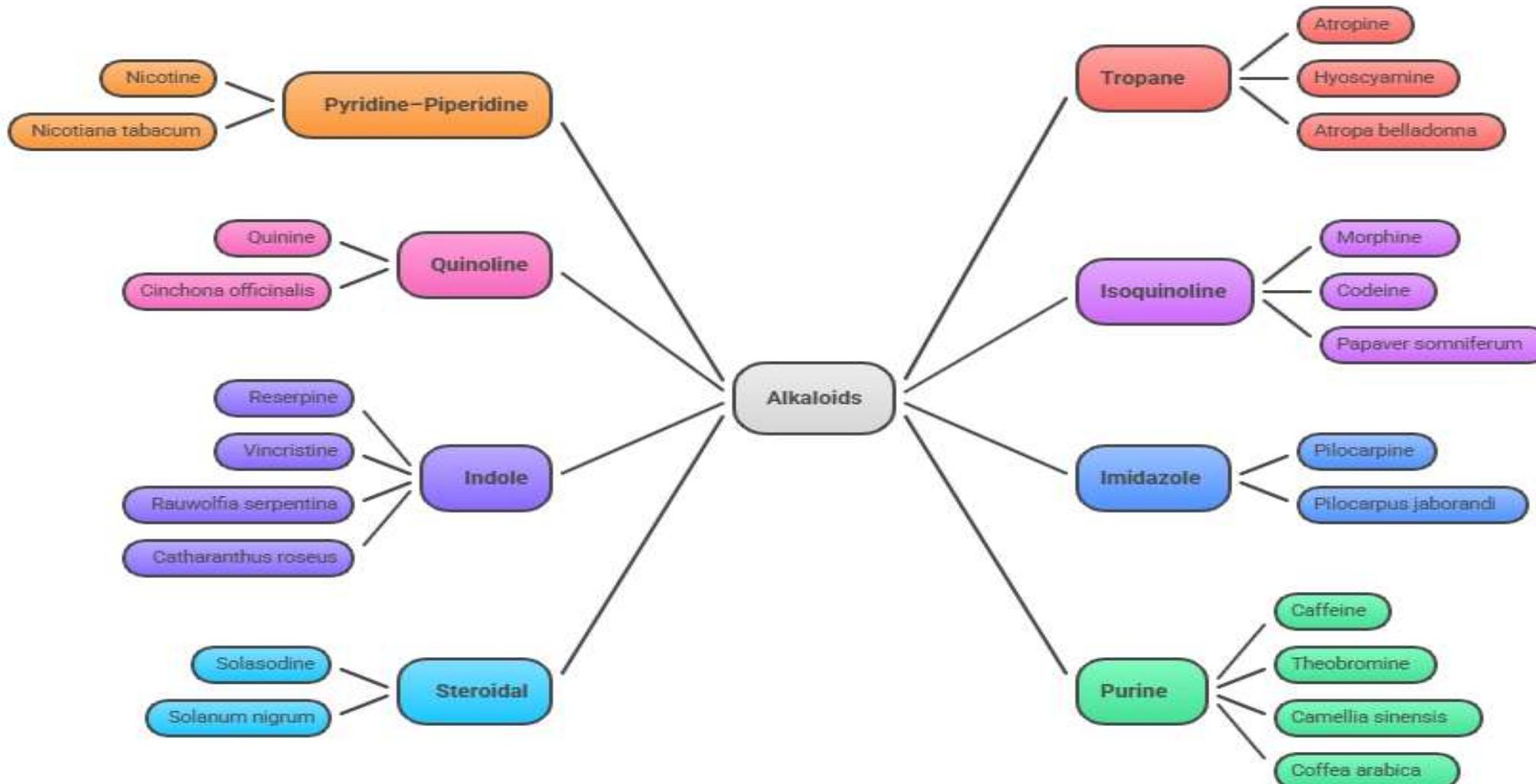
Ornithine is a precursor to tropane alkaloids found in belladonna.



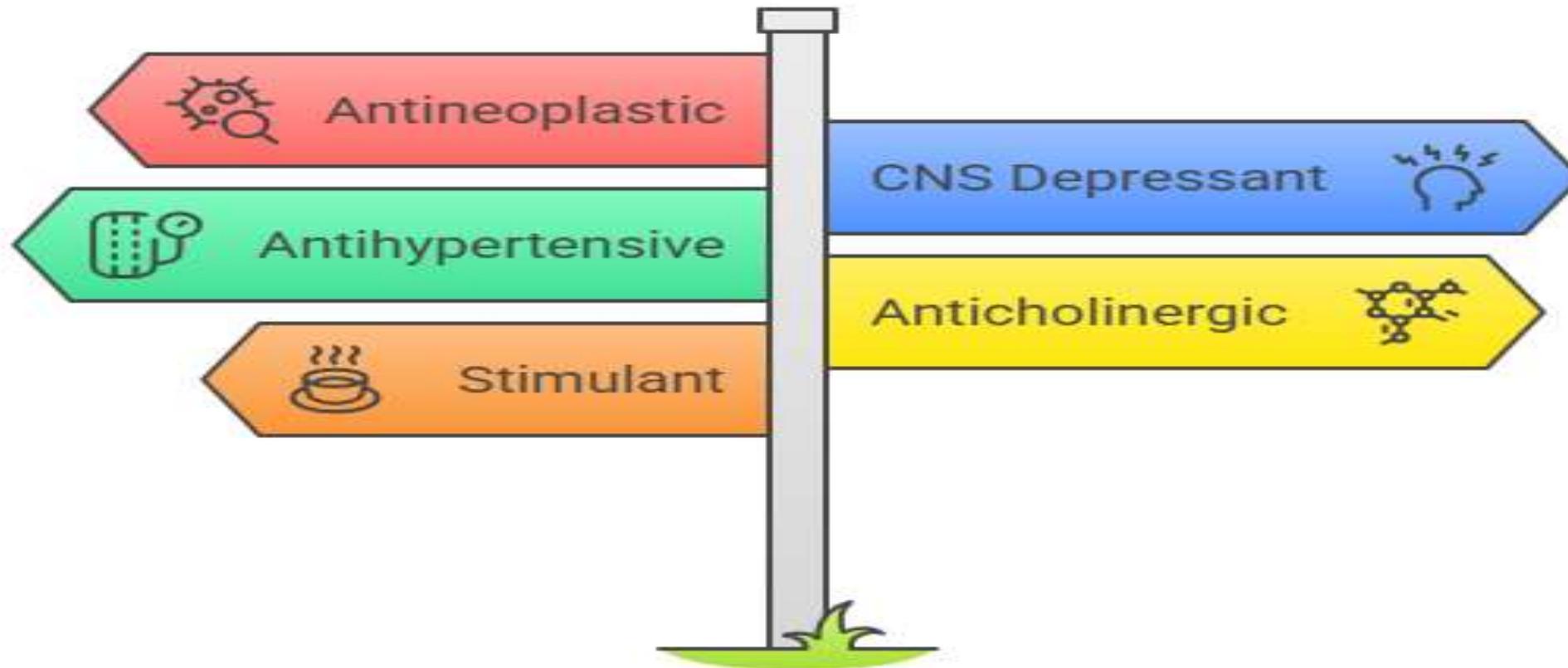
Lysine

Lysine is a precursor to piperidine alkaloids found in lobelia.

Classification of Alkaloids Based on Chemical Structure



What is the pharmacological action of the drug?



Alkaloid Chemical Tests

Murexide test

For purine alkaloids, uses caffeine, HCl, KClO_3 , and ammonia, producing a purple color.



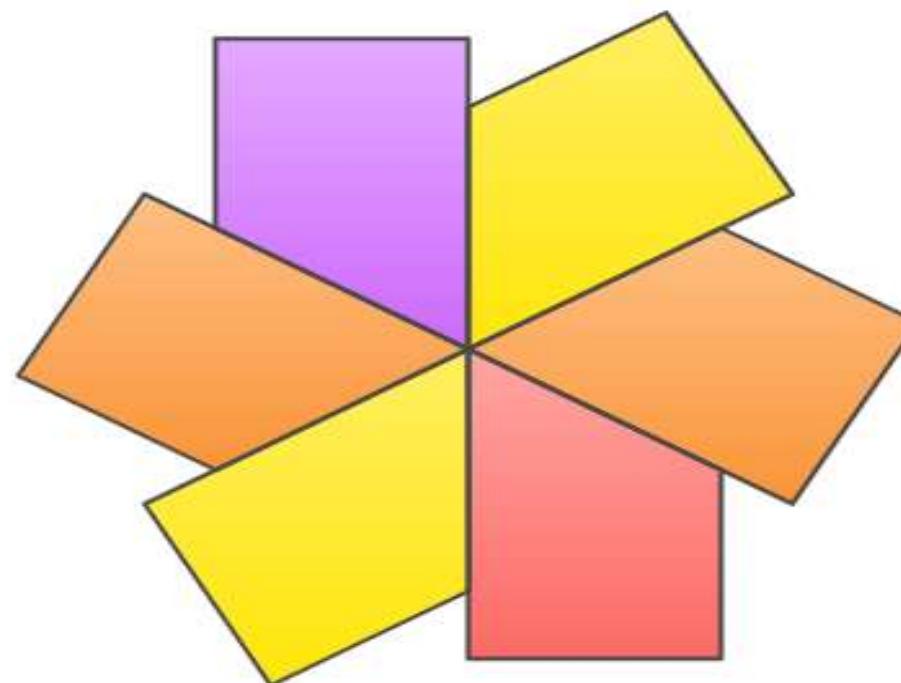
Tannic acid test

Uses tannic acid solution, resulting in precipitation.



Hager's test

Involves picric acid, generating a yellow precipitate.



Mayer's test

Uses potassium mercuric iodide, resulting in a creamy white precipitate.



Wagner's test

Employs potassium triiodide, producing a reddish-brown precipitate.



Dragendorff's test

Utilizes potassium bismuth iodide, leading to an orange-red precipitate.



Alkaloid Key Points



Bioactive Compounds

Alkaloids are potent bioactive compounds with diverse pharmacological roles.

Most clinical alkaloid drugs are antineoplastic, antihypertensive, or CNS-active agents.



Clinical Alkaloid Drugs



Chemical Diversity

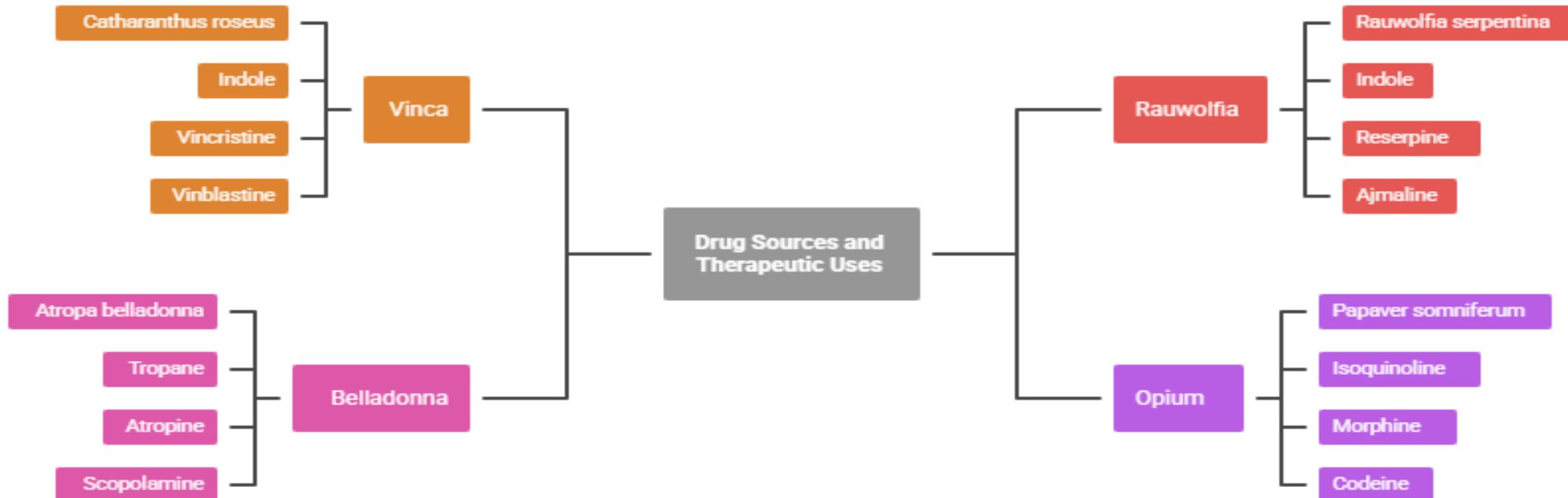
Their chemical diversity forms the foundation of modern synthetic drug design.

Knowledge of biosources, chemistry, and identification tests is vital in pharmacognostic standardization.



Pharmacognostic Standardization

Drug Sources and Therapeutic Uses



Guess the Substance

I am bitter, nitrogenous, and fight cancer.

I contain two indole rings joined together.

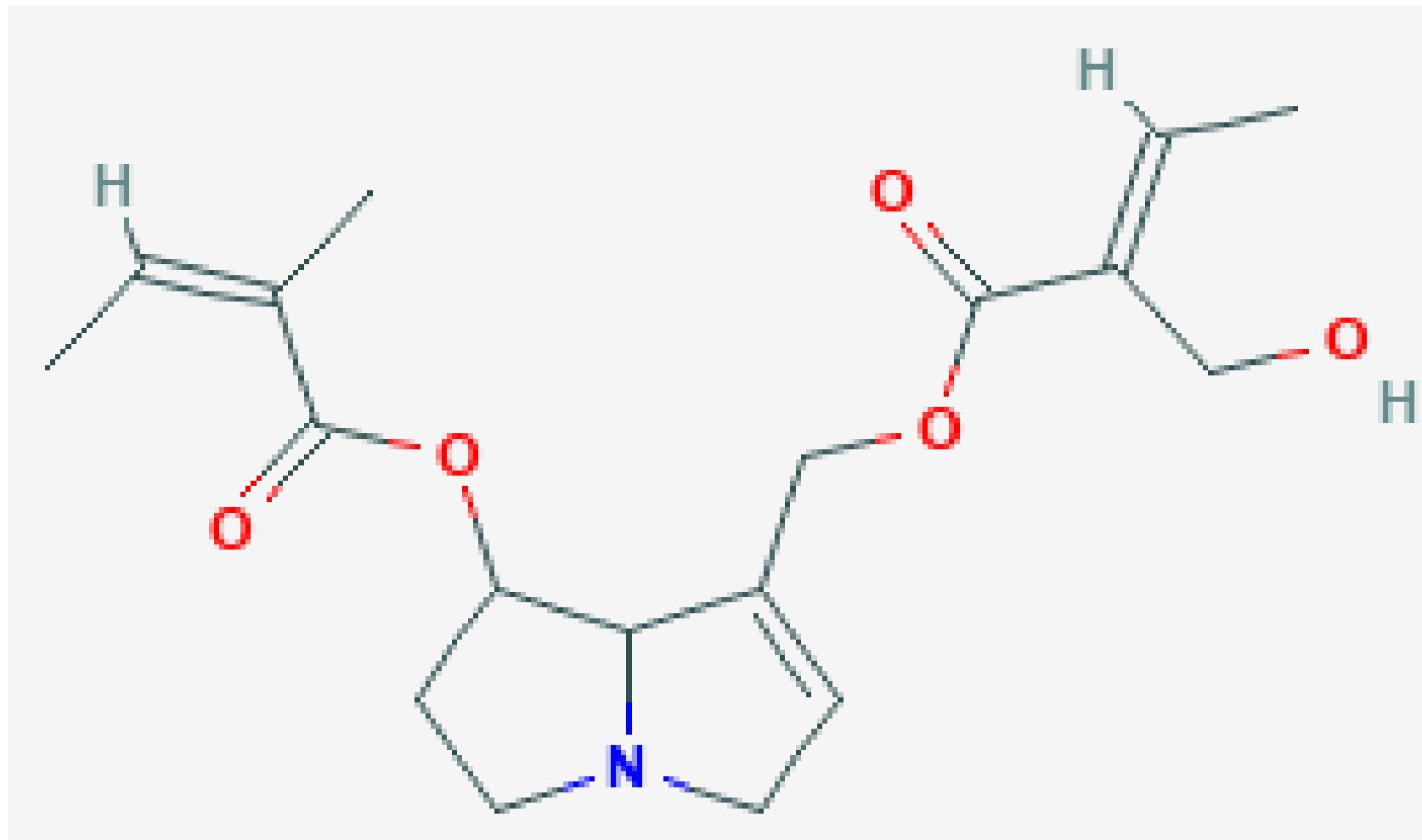
I make pupils dilate in hospitals.

I am sweet outside but dangerous inside.

I am rich in EGCG and protect your cells.

I heal burns but my latex purges.





Assessment towards you

01

1. Alkaloids are best defined as:

- A. Nitrogen-free secondary metabolites
- B. Acidic compounds present in plants
- C. Basic nitrogen-containing organic compounds of plant origin**
- D. Carbohydrate derivatives



02

2. Which of the following is a characteristic property of alkaloids?

- A. Insoluble in organic solvents
- B. Neutral in nature
- C. Form salts with acids**
- D. Sweet in taste



03

3. Dragendorff's reagent is commonly used for the detection of:

- A. Glycosides
- B. Tannins
- C. Flavonoids
- D. Alkaloids**



