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 :BIOCHEMISTRY
D.PHARM/ II YEAR

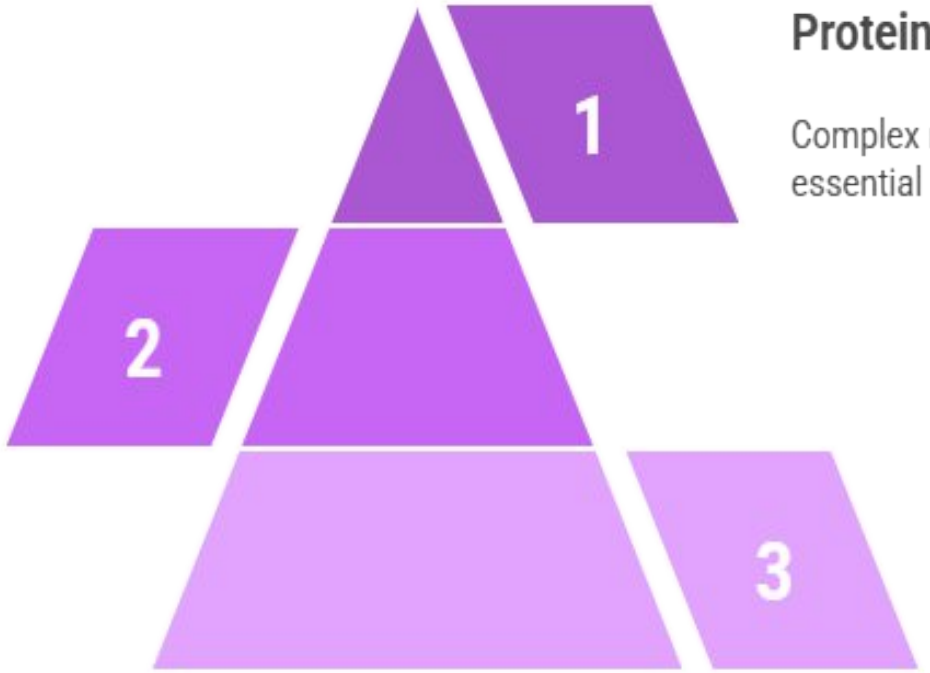
TOPIC: DEFINITION, CLASSIFICATION OF PROTEINS BASED ON COMPOSITION AND SOLUBILITY WITH EXAMPLES

DESIGN THINKING STAGES IN CLASSIFICATION

Empathize: Understand the users — in this case, students, pharmacists, or researchers who use the alphabetical classification system.

Define: Clearly define the problem based on the insights from the empathize stage.
Ideate: Generate possible solutions or improvements. **Prototype:** Create a tangible version of your solution **Test:** Evaluate the prototype with real users.

Protein Hierarchy



Proteins

Complex molecules essential for life

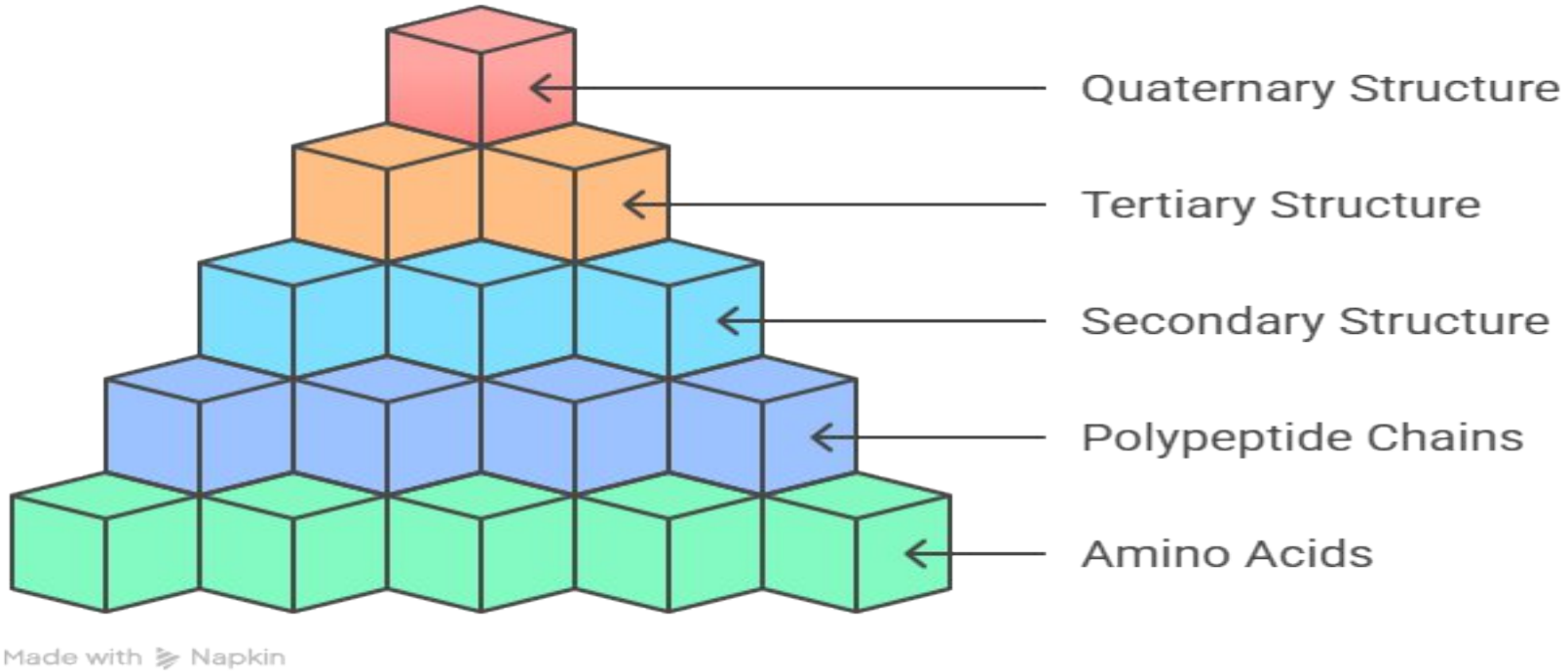
Polypeptide Chains

Sequences of amino acids linked by peptide bonds

Amino Acids

Building blocks of proteins

Protein Structure Hierarchy



Protein Classification

Composition

Proteins are classified based on their chemical makeup, including simple, conjugated, and derived types.

Function

Proteins are grouped by their biological roles, including catalytic, transport, and structural functions.

Structure

Proteins are categorized by their structural folds, such as all alpha, all beta, and mixed types.

Shape

Proteins are categorized by their physical form, such as fibrous, globular, and intermediate structures.

Solubility

Proteins are classified based on their ability to dissolve in different solvents.

Nutritional Value

Proteins are classified as complete, incomplete, or complementary based on their amino acid content.

Classification of Proteins

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Understanding Simple Proteins

1 Simple proteins consist entirely of amino acids.

Amino Acid Composition

Simple proteins lack non-amino acid components.

Absence of Prosthetic Group

3 Hydrolysis of simple proteins produces only amino acids.

Hydrolysis Products

Amino Acids

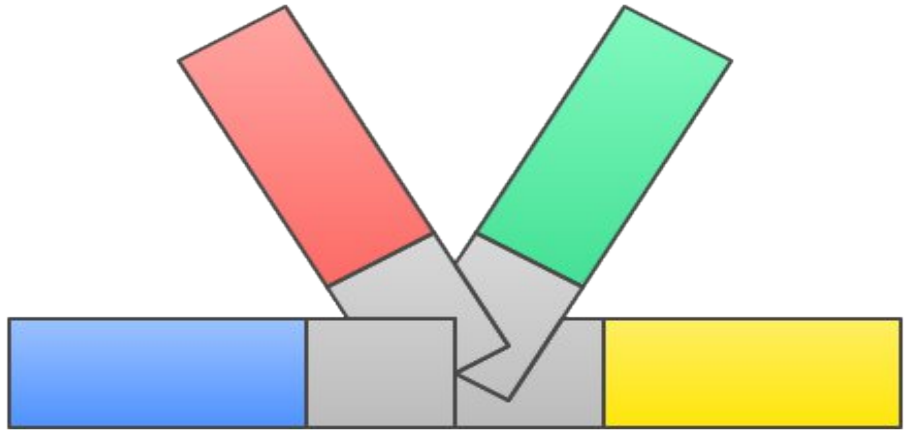
What are the characteristics and examples of albumins?

Heat Coagulation

Albumins coagulate when heated, which is useful in cooking and industrial applications.

Salt Insoluble

Albumins are insoluble in concentrated salt solutions, which can be used for separation techniques.



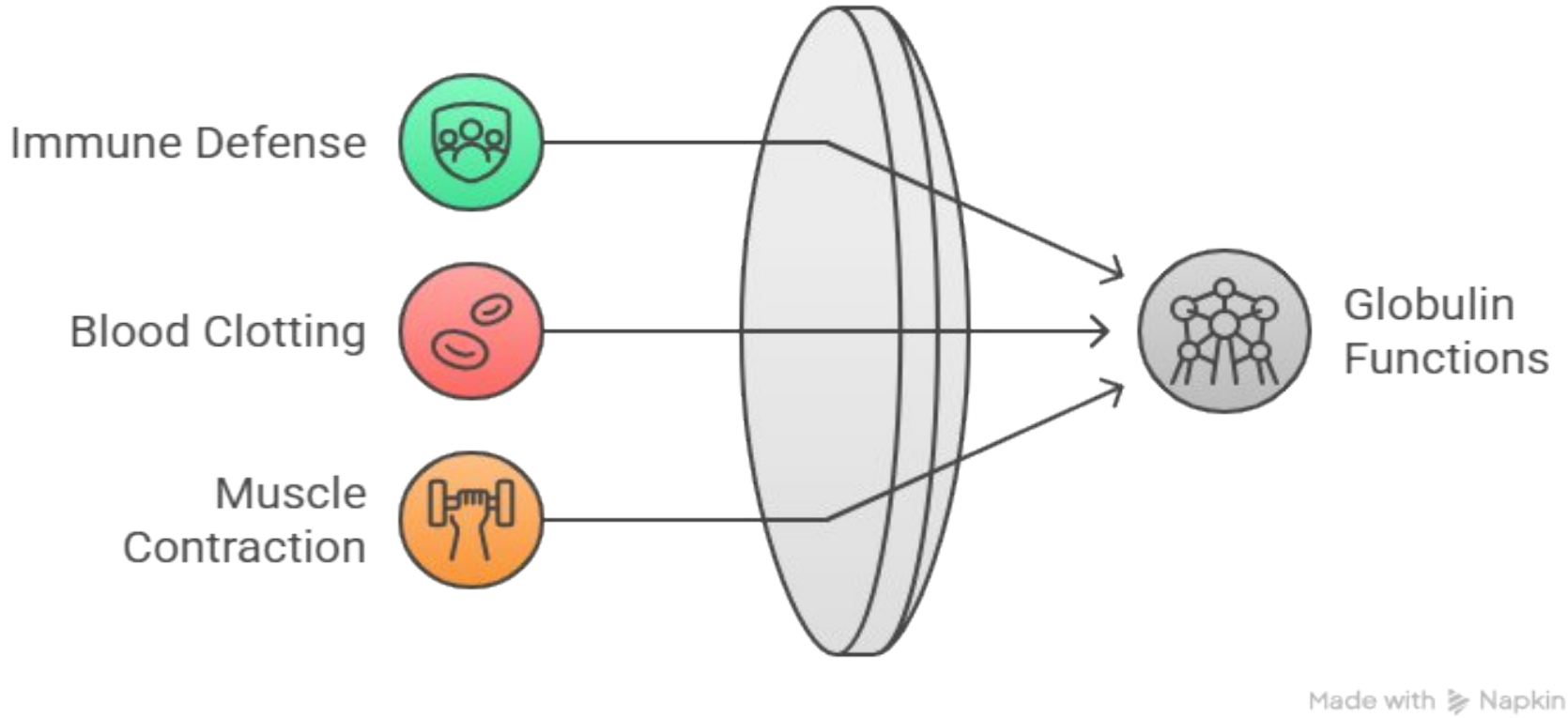
Solubility

Albumins are soluble in water, making them essential for biological processes.

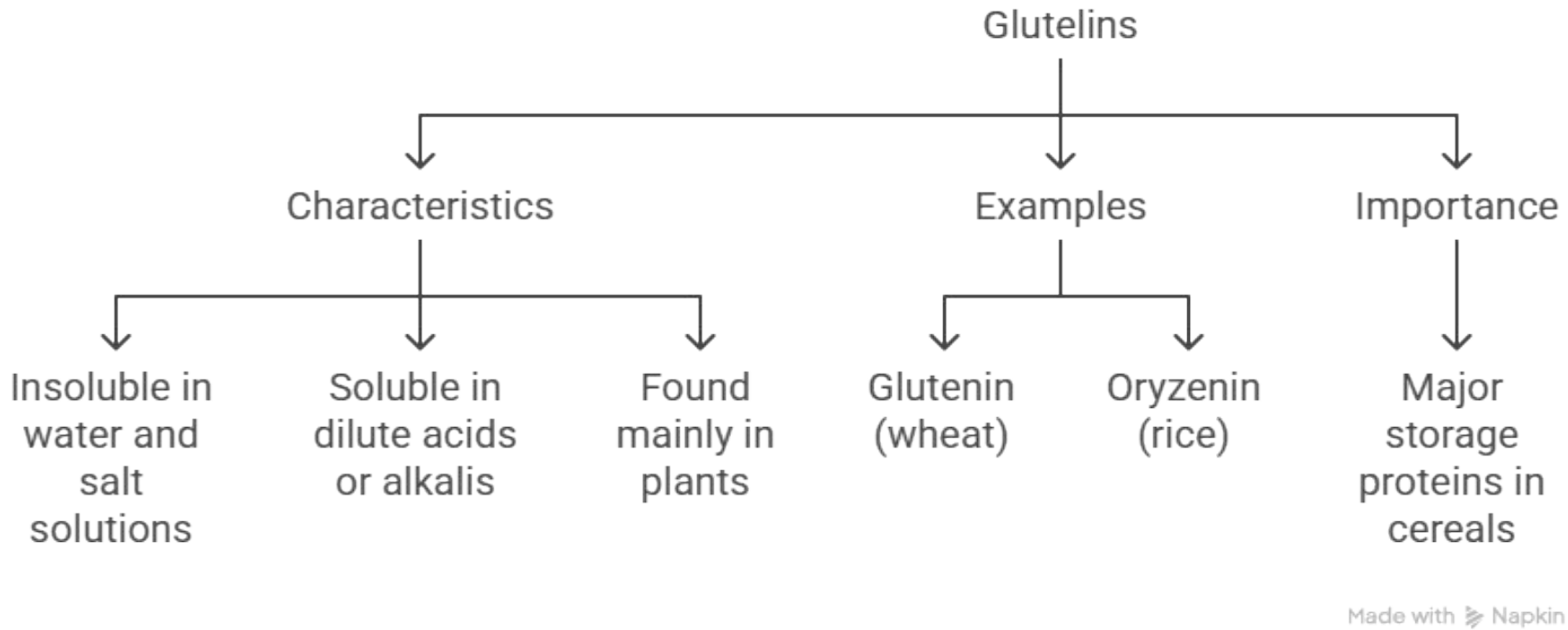
Examples

Albumins are found in blood, eggs, milk, and plants, highlighting their diverse roles.

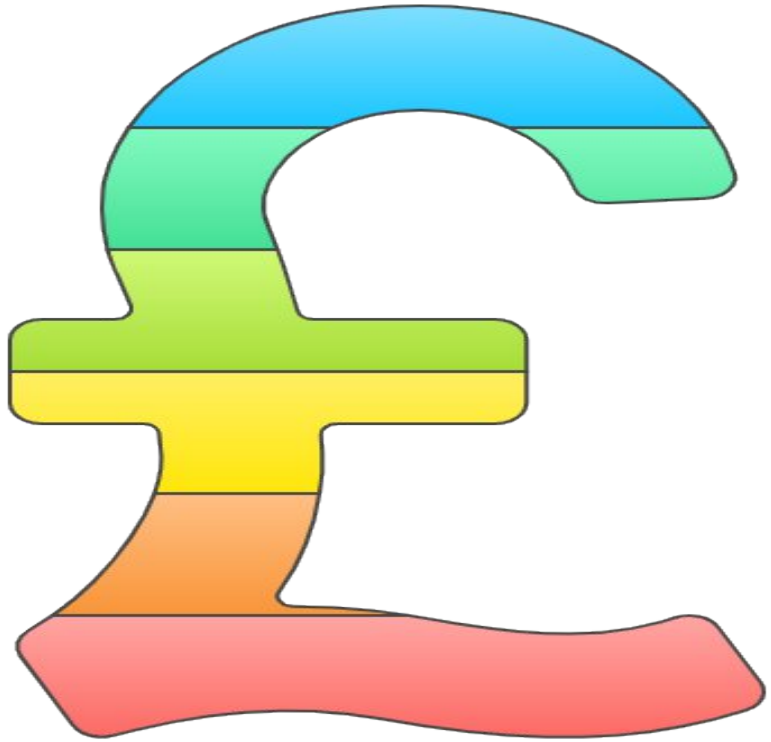
The Multifaceted Role of Globulins



Glutelins Characteristics and Examples



Understanding Prolamins



Water Insoluble

Prolamins do not dissolve in water

Alcohol Soluble

Prolamins dissolve in 70-80% alcohol

Proline and Glutamine Rich

Prolamins are high in proline and glutamine

Gliadin

A prolamin found in wheat

Zein

A prolamin found in maize

Hordein

A prolamin found in barley

Understanding Basic Proteins

Function

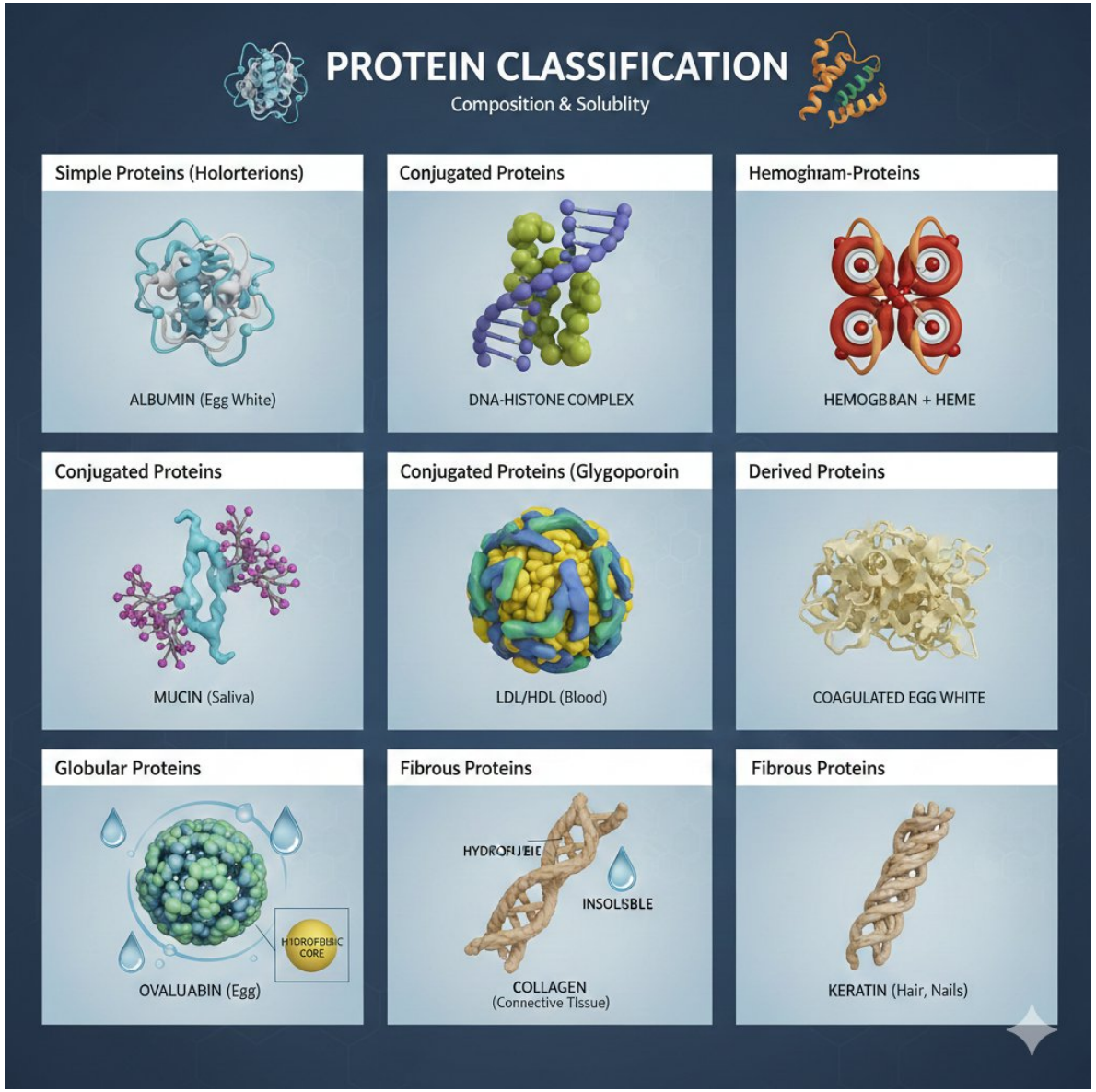
DNA packaging in chromosomes is the primary role of basic proteins

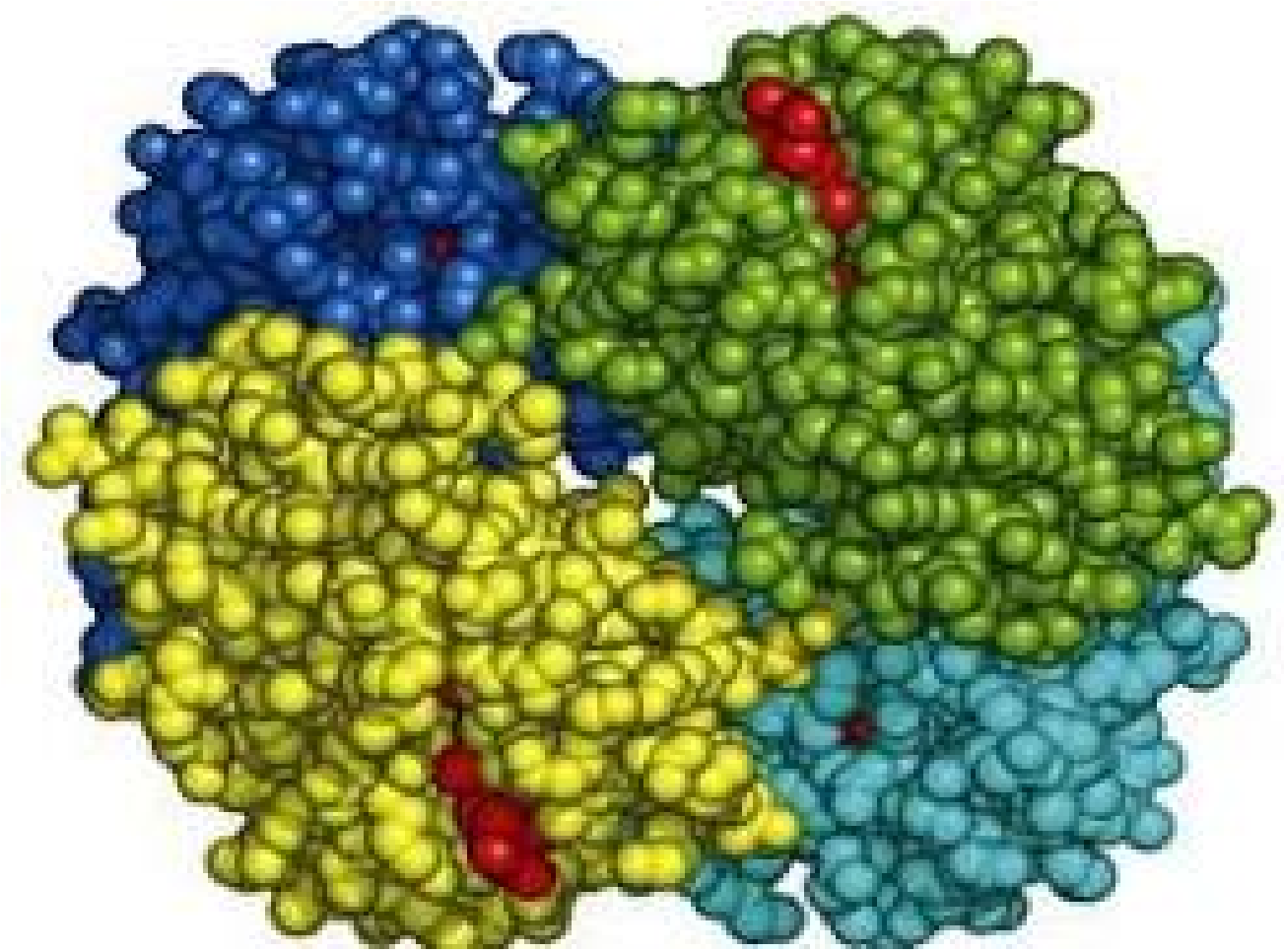
Characteristics

Basic proteins rich in lysine and arginine, soluble in water

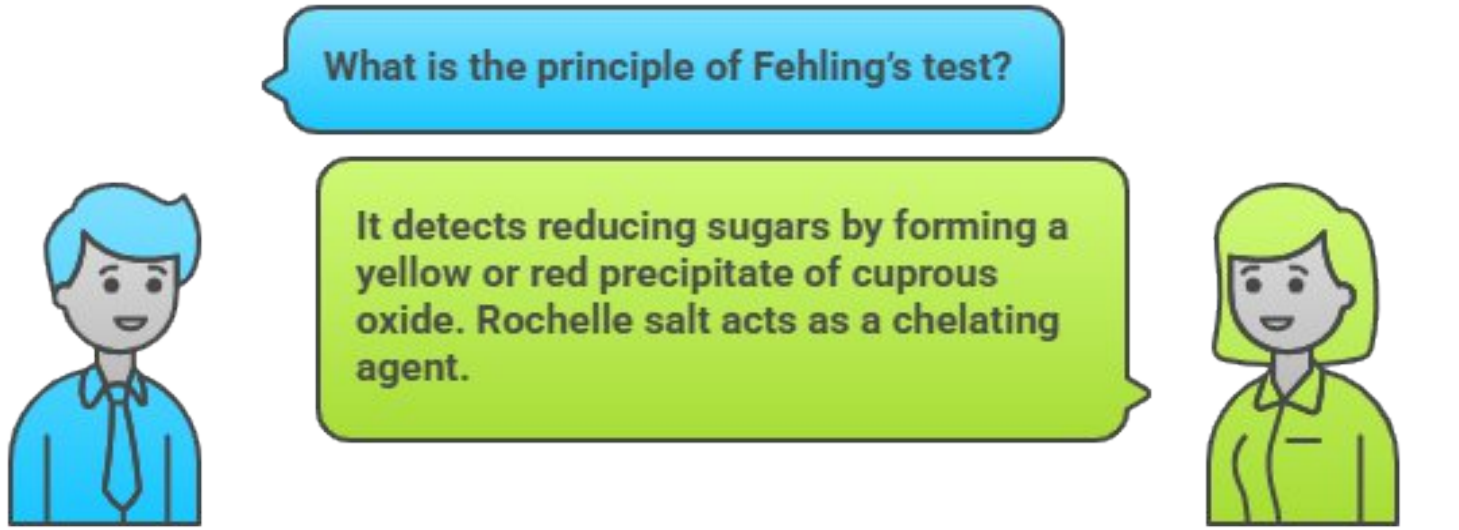
Examples

Nuclear histones are a prime example of basic proteins


PROTEIN CLASSIFICATION
Composition & Solublity
Simple Proteins (Holorterions)
ALBUMIN (Egg White)
Conjugated Proteins
DNA-HISTONE COMPLEX
Hemoghram-Proteins
HEMOGBBAN + HEME
Conjugated Proteins
MUCIN (Saliva)
Conjugated Proteins (Glygoporoin
LDL/HDL (Blood)
Derived Proteins
COAGULATED EGG WHITE
Globular Proteins
OVALUABIN (Egg)
Fibrous Proteins
INSOLUBLE
COLLAGEN
(Connective Tissue)
Fibrous Proteins
KERATIN (Hair, Nails)



Fehling's Test for Reducing Sugars



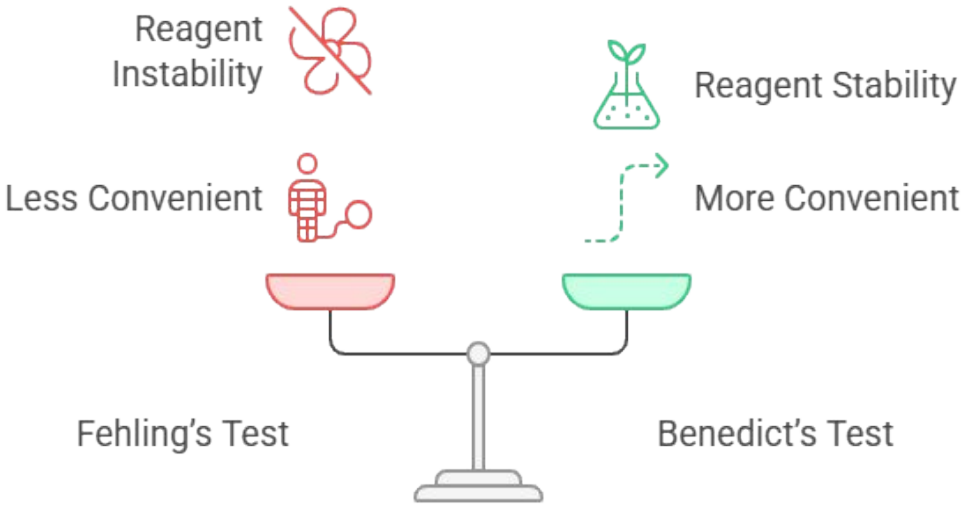
Fehling's Test Procedure

- Mix Fehling's Reagent
- Add Reagent to Test Solution
- Mix Thoroughly
- Place in Boiling Water Bath
- Observe for Red Precipitate

ASSESMENT

Carbohydrates: The Foundation of Life

Compare Fehling's and Benedict's Tests



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Choose the appropriate test for detecting reducing sugars based on color change.

VS

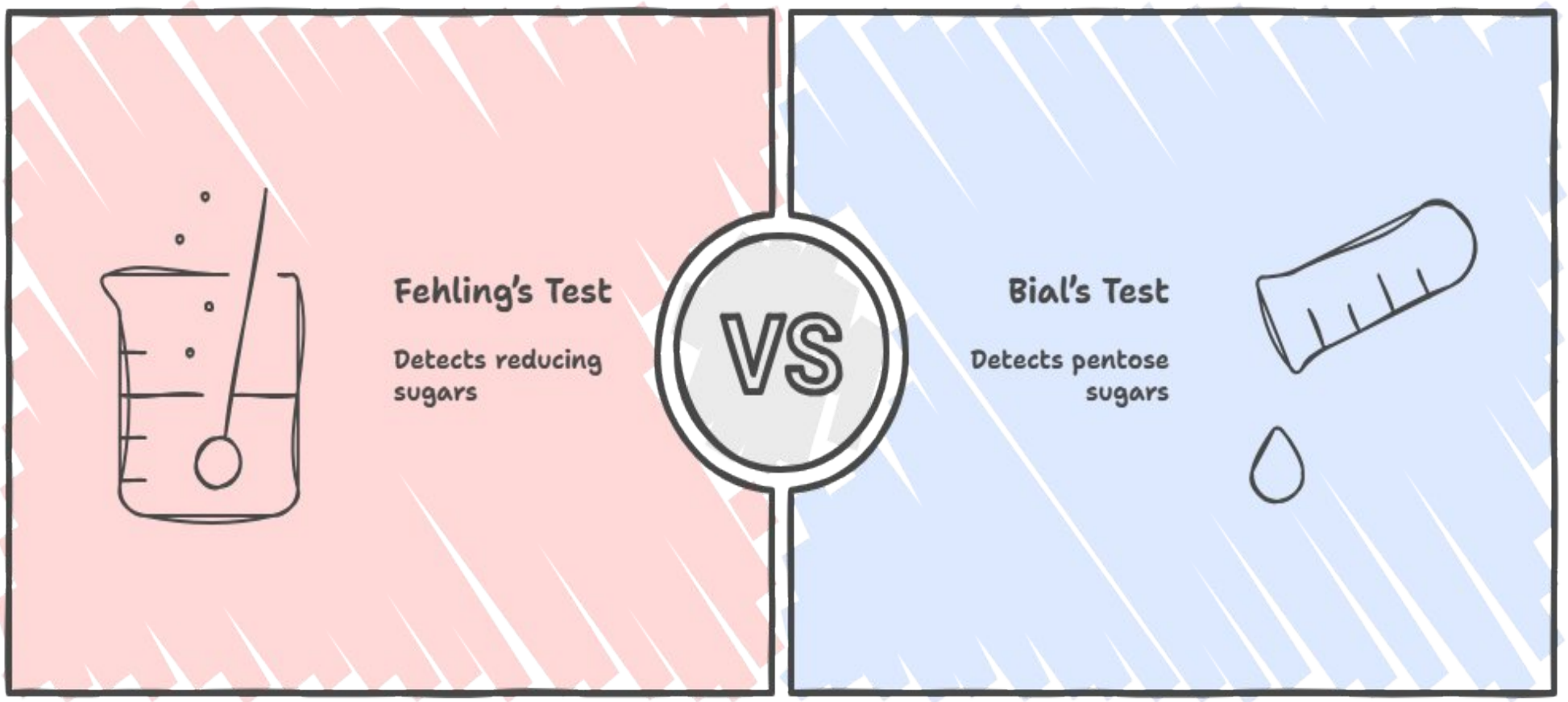
Picric Acid Test

Detects reducing sugars with a red color change

Fehling's Test

Detects reducing sugars with a yellow or red precipitate

Which test is suitable for detecting specific types of sugars?



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REFERENCES

1. **U. Satyanarayana & U. Chakrapani** – Biochemistry, Elsevier
2. **Lehninger** – Principles of Biochemistry, W.H. Freeman
3. **Harper** – Illustrated Biochemistry, McGraw Hill
4. **Stryer** – Biochemistry, W.H. Freeman
5. **NCERT Biology (Class XI)** – Biomolecules chapter


Thank You