

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 : BIO CHEMISTRY

D.PHARM/ II YEAR

TOPIC: DISACCHARIDES

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.

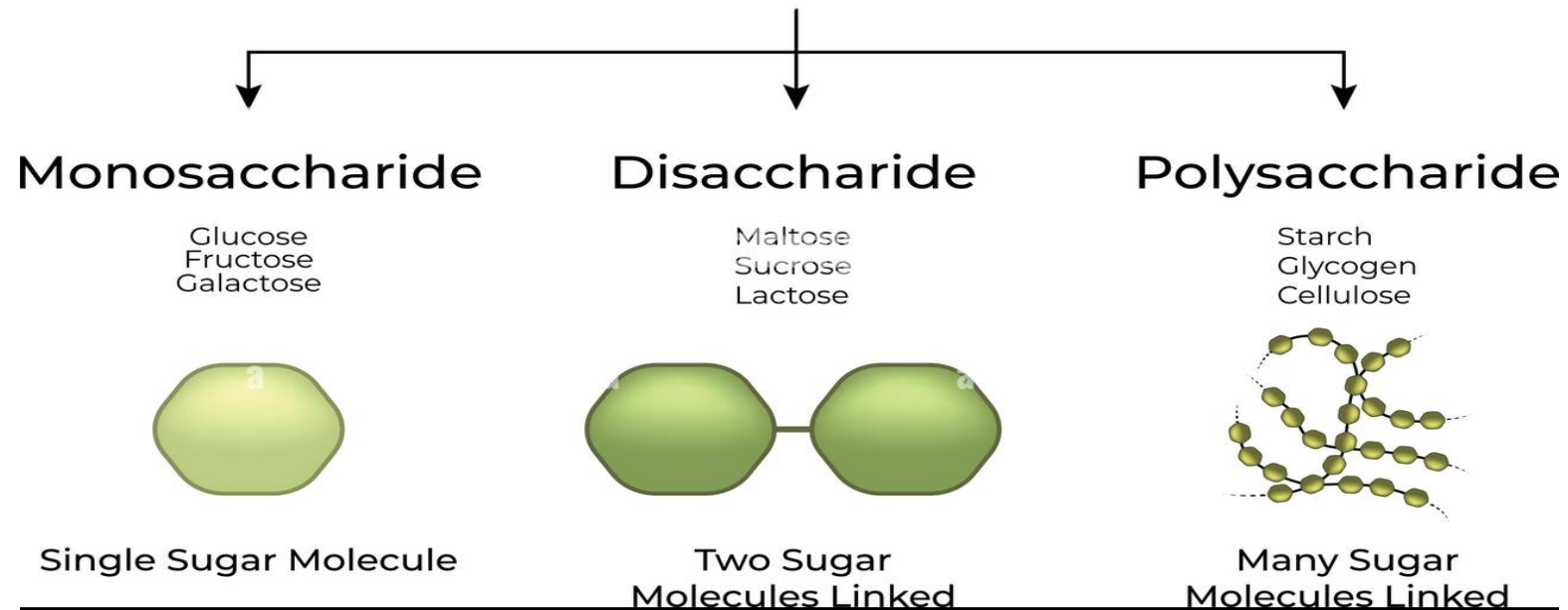
Ideate: Generate possible solutions or improvements.

Prototype: Create a tangible version of your solution **Test:**

Evaluate the prototype with real users.

CLASSIFICATION OF CARBOHYDRATES

Carbohydrates



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Functional roles and structure of saccharides types

The purpose of this slide is to highlight various types of saccharides and their distinct structural features to understand the practical implications of saccharide structures in various biological processes such as monosaccharides, disaccharides, etc.

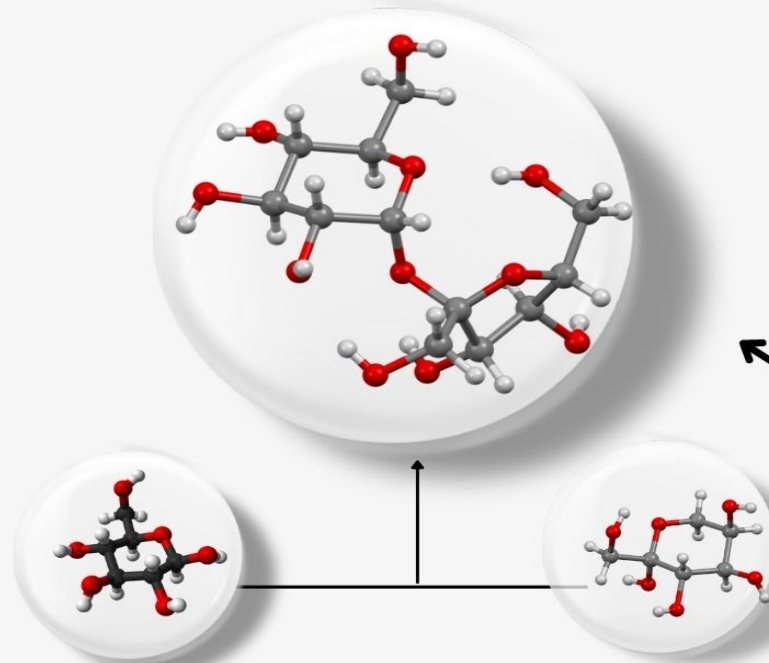


DEFINITION OF DISACCHARIDE



Disaccharide

Disaccharides are carbohydrates (sugars) that are formed by the combination of two monosaccharides.

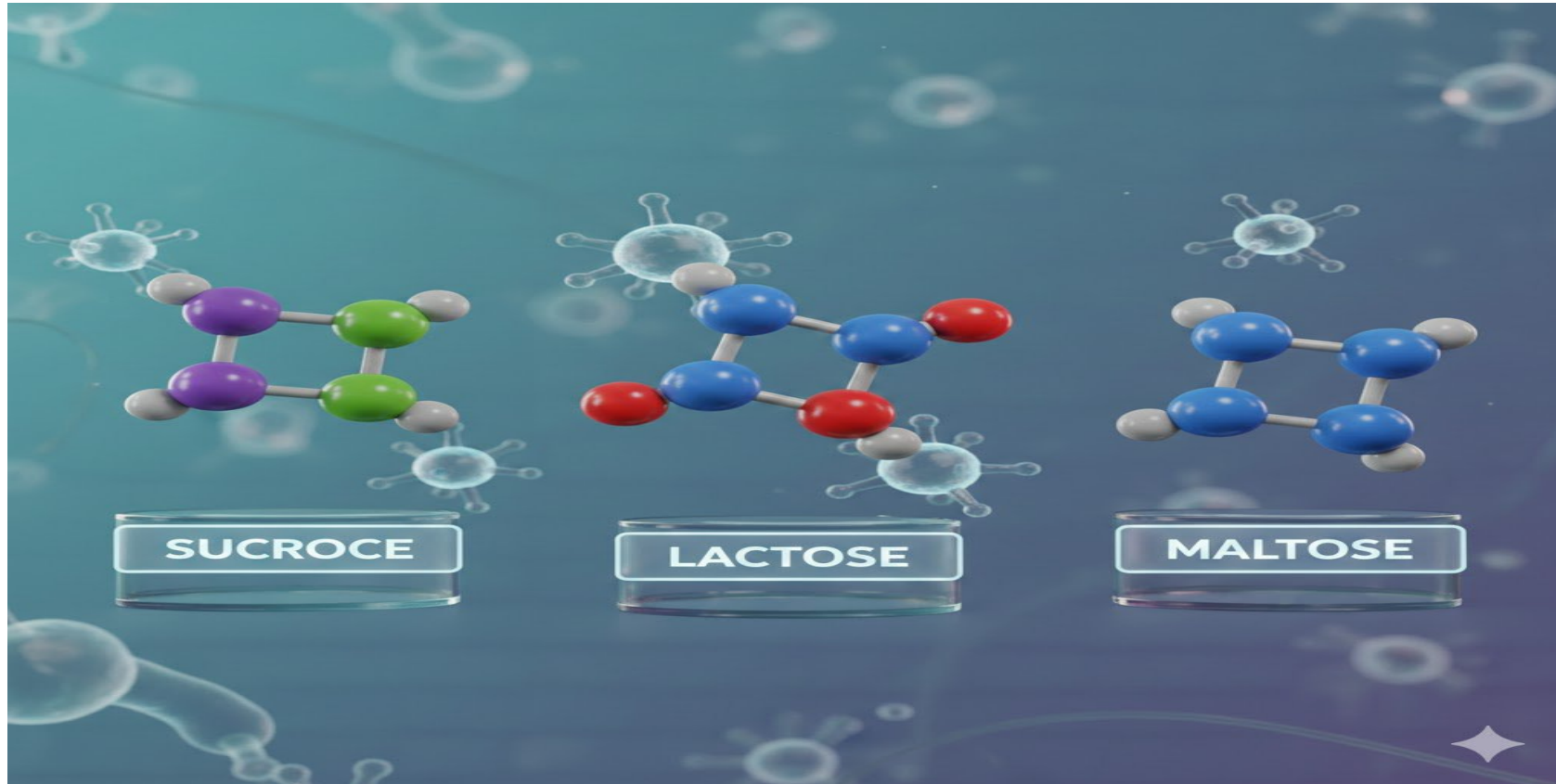


GLUCOSE & FRUCTOSE

SUCROSE IS A DISACCHARIDE FORMED BY THE JOINING OF 2 MONOSACCHARIDES

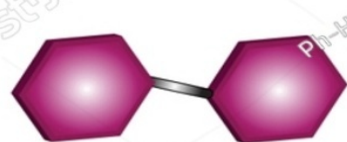


3D DIMENSIONAL STRUCTURE FOR DISACCHARIDE COMPOUNDS

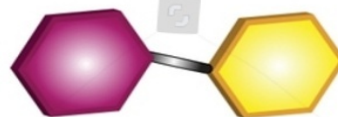


STRUCTURE OF DISACCHARIDE CLASSIFICATION

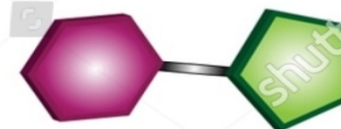
Disaccharide



Maltose



Lactose

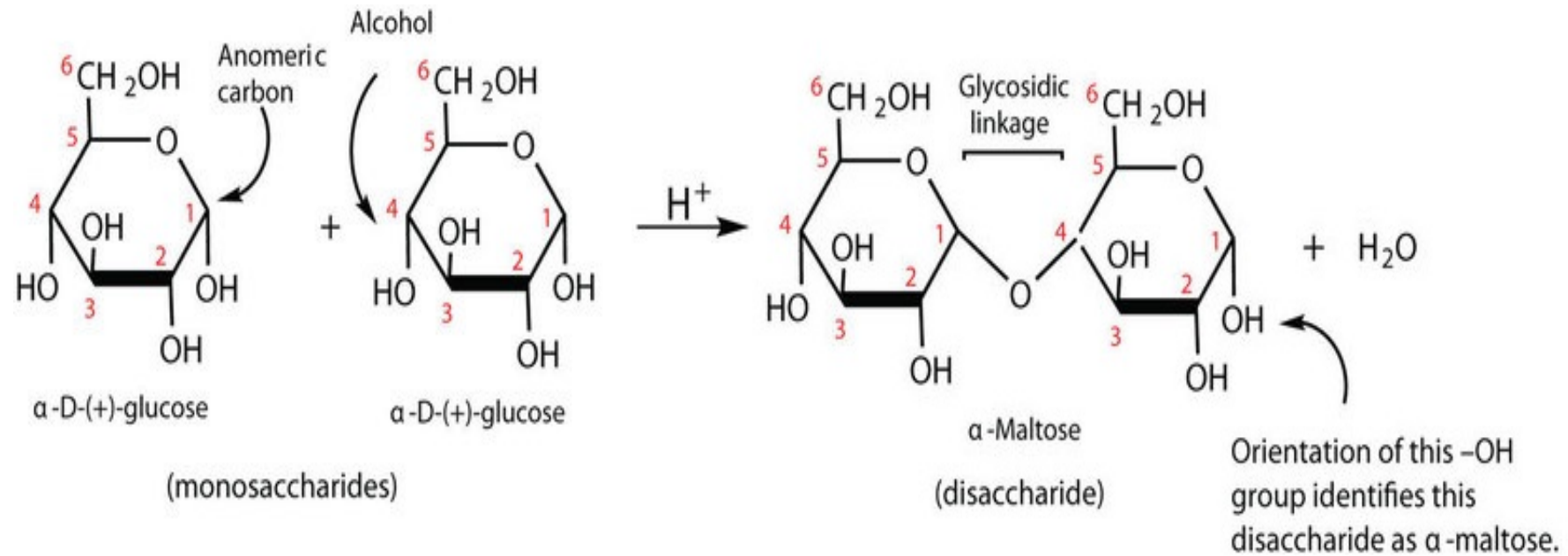


Sucrose

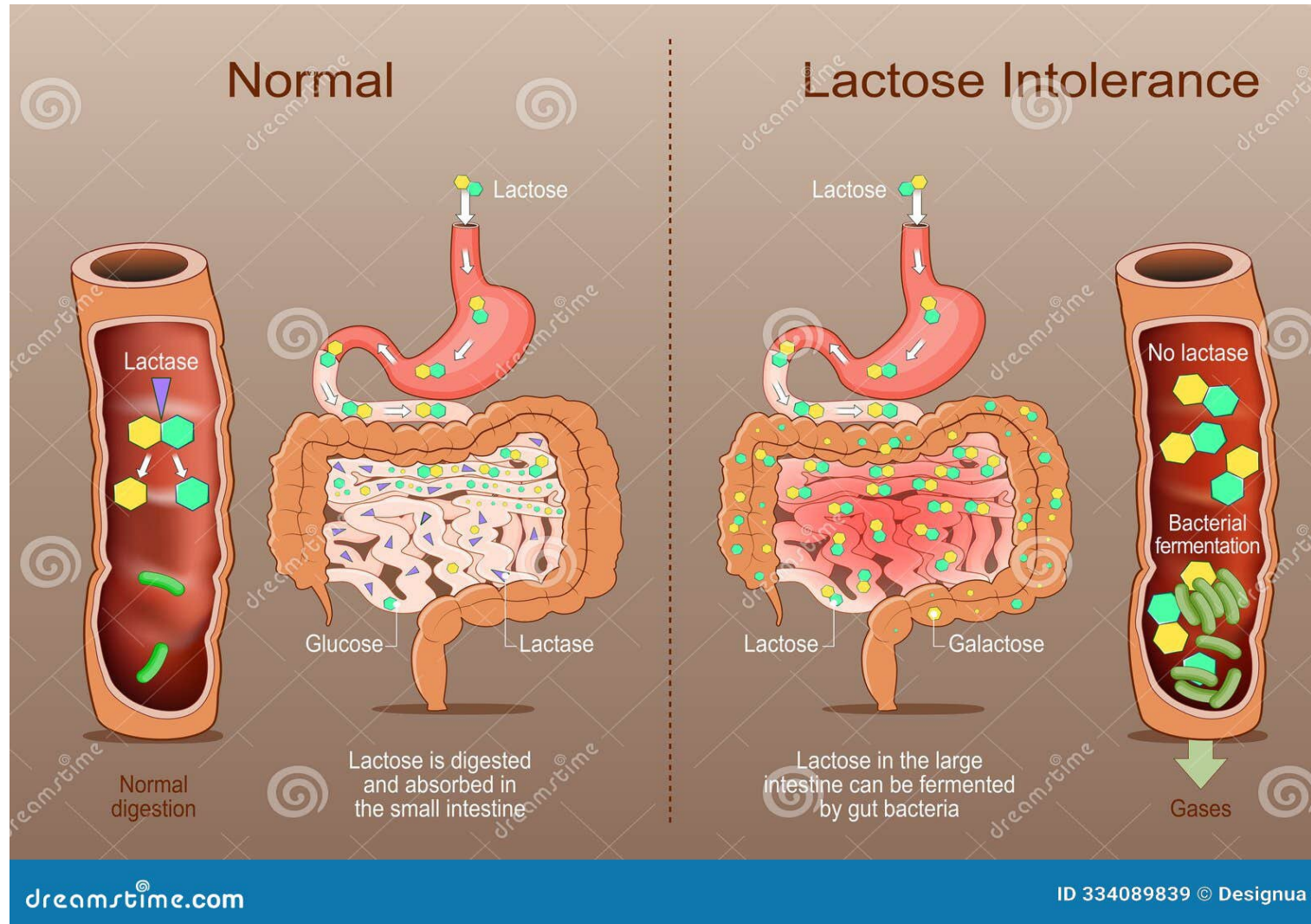
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STRUCTURE OF DISACCHARIDE VS MONOSACCHARIDE



DIFFERENCE BETWEEN NORMAL DIGESION VS LACTOSE INTOLERANCE DIGESTION



STRUCTURAL FORMULA AND MOLECULAR FORMULA FOR MALTOSE

Maltose (Maltobiose)

Malt sugar
Disaccharide
Reducing sugar

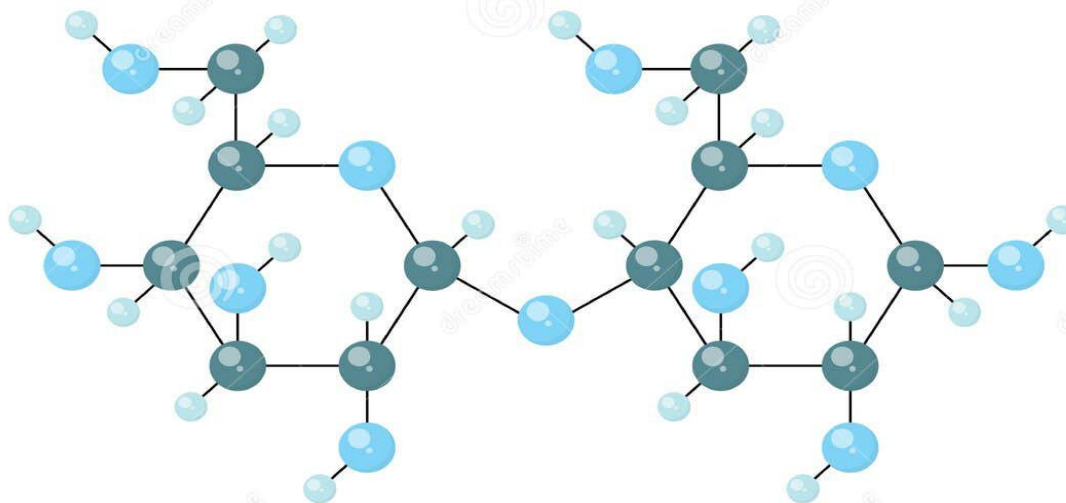
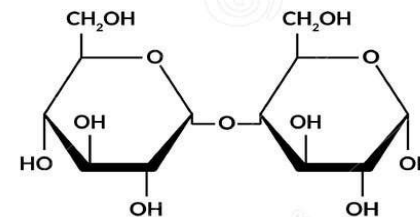
VECTOR OBJECTS
EPS 10

Molecular Formula of
Maltose:



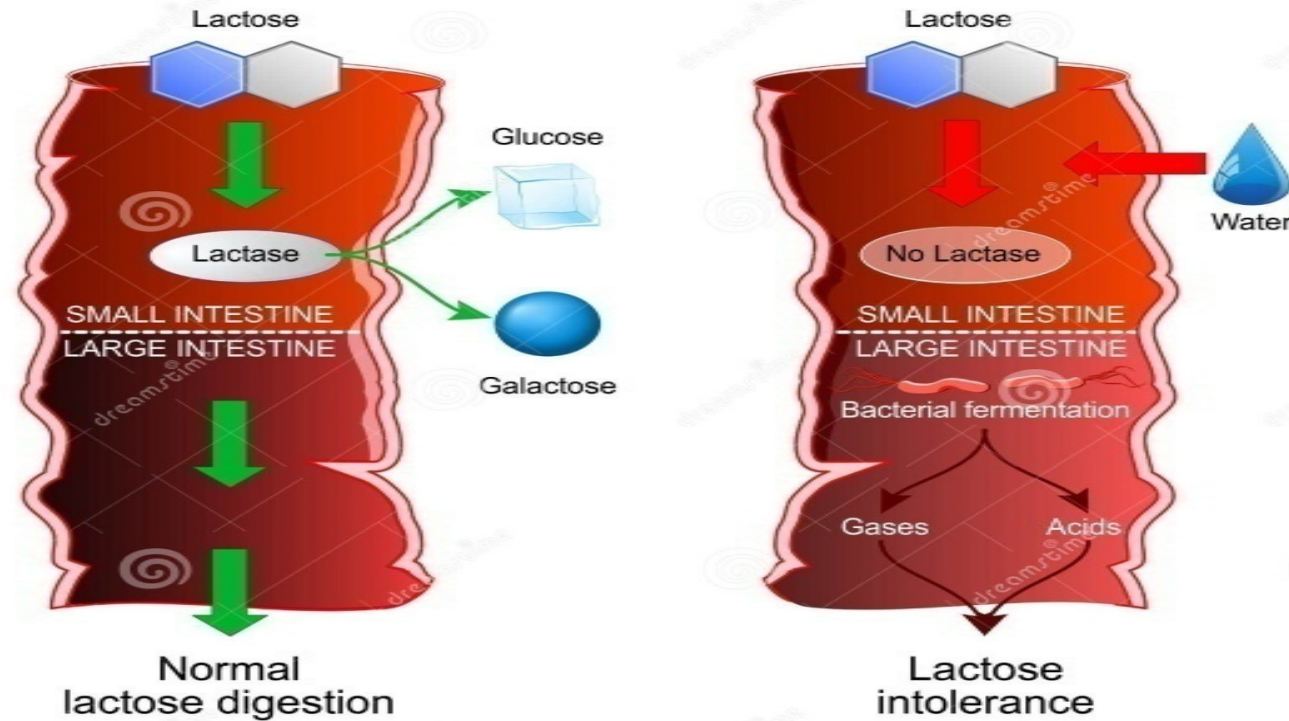
● C Carbon
● O Oxygen
● H Hydrogen

Structural Formula of
Maltose:



LACTOSE INTOLERANCE IN SMALL INTESTINE AND LARGE INTESTINE

Lactose Intolerance



A STUDY OF LACTOSE PLAYS AN MAJOR ROLE ON MILK PRODUCT

Lactose plays a central role in milk and is considered an exotic sugar in nature.

Milk has two types of protein, whey and casein. Both contain lactose.



Milk




Forsythia flowers



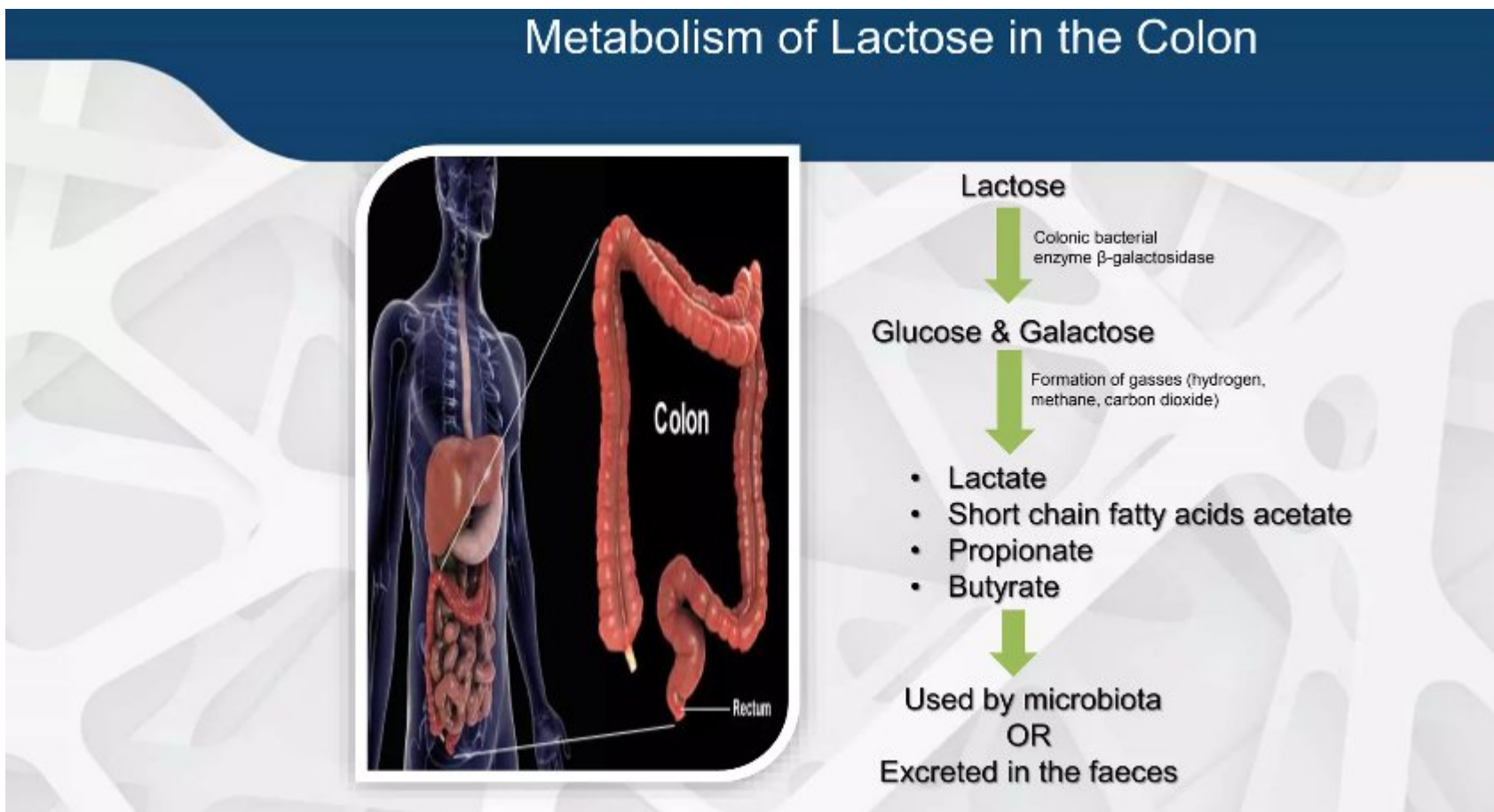
Some tropical shrubs

Evolution of Lactose as the Main Carbohydrate in Milk

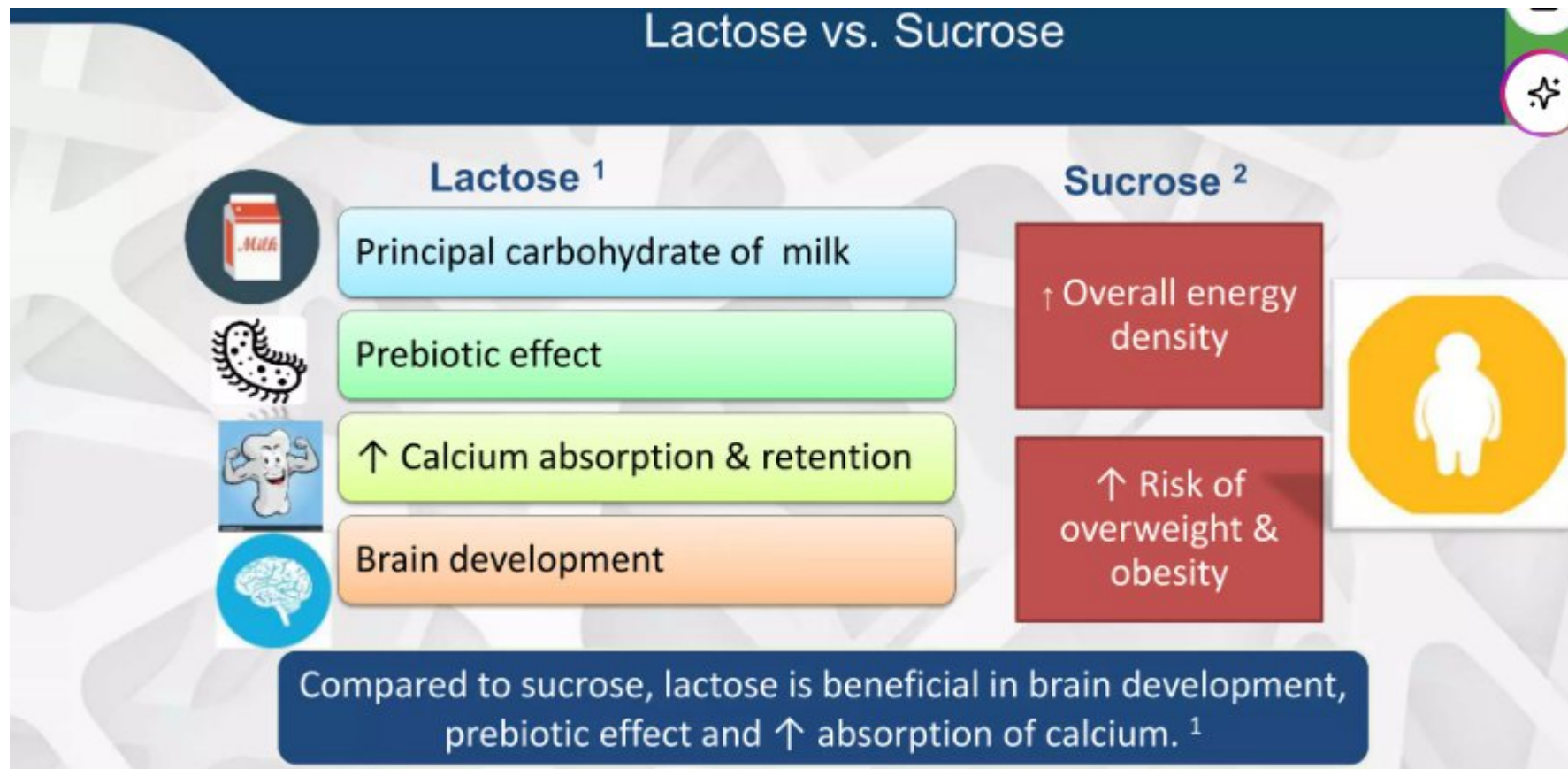


- Why **lactose** not **glucose** is used as energy carrier for breast feeding?
- Lactose is the only source of galactose which is a major component of human and higher primate brains.
- Galactose plays an important role in the biosynthesis of glycoproteins, and glycolipids.
- Galacto-oligosaccharides have Prebiotic properties.
- Galactose helps in the construction of gangliosides which plays an important role in signal transduction and immunity.
- Galactose also plays a vital role in myelination that occurs all through 1st year of life.

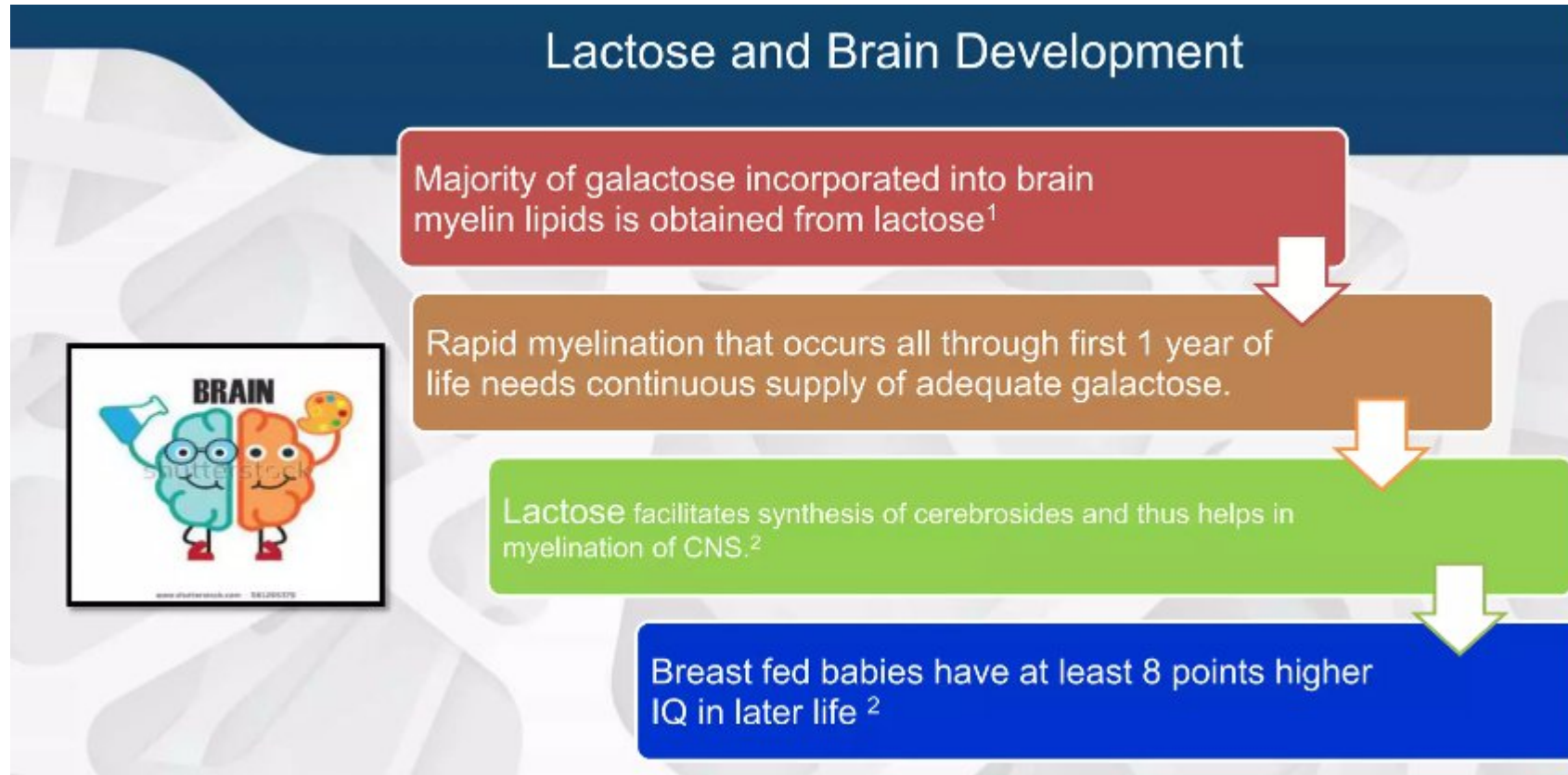
METABOLISM OF LACTOSE IN THE COLON AREAS



DIFFERENCE BETWEEN LACTOSE VS SUCROSE



A STUDY OF LACTOSE ON BRAIN DEVELOPMENT

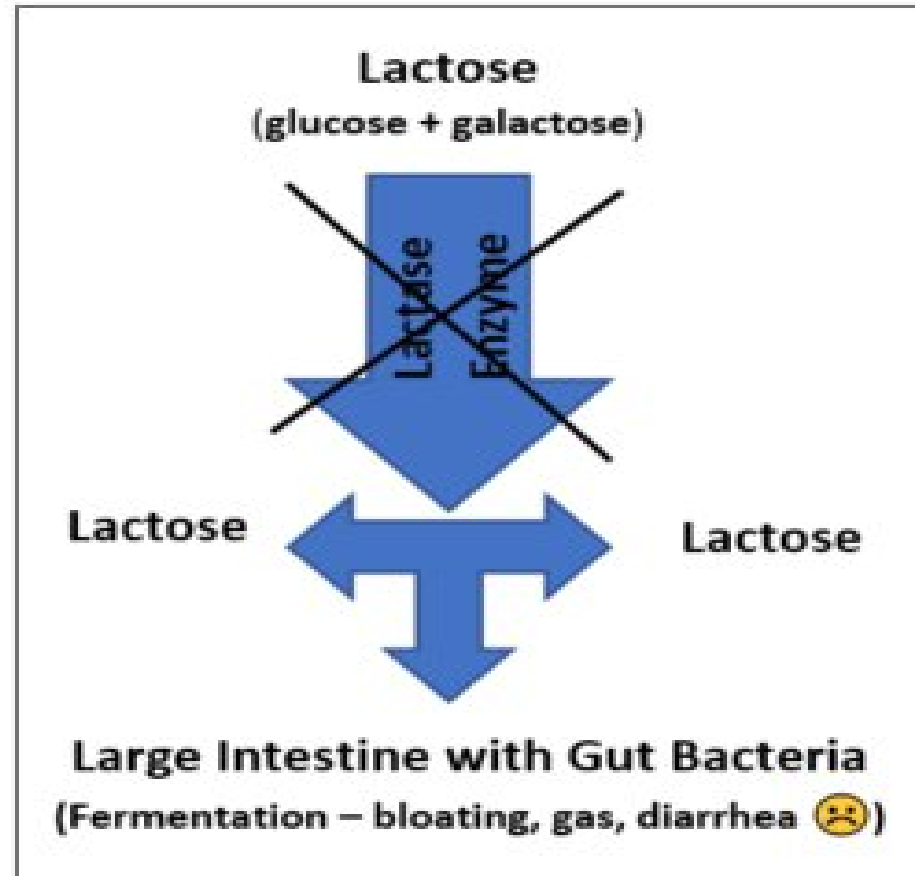


ASSESSMENT

Which disaccharide is represented in the 3D ball-and-stick model below



LACTOSE INTOLERANCE



REFERENCES

1. Nelson, D. L., & Cox, M. M. Lehninger Principles of Biochemistry (Latest ed.). - Chapters on carbohydrates (covers sucrose, lactose, maltose).
2. Berg, J. M., Tymoczko, J. L., Gatto, G. J., & Stryer, L. Biochemistry (Stryer). – Clear explanations of glycosidic bonds and disaccharides.
3. Voet, D., Voet, J. G., & Pratt, C. W. Fundamentals of Biochemistry: Life at the Molecular Level.
4. Murray, R. K. et al. Harper's Illustrated Biochemistry. – Very popular for medical and health sciences.
- Online / Open Educational Resources 5. LibreTexts Chemistry – Carbohydrates – Detailed sections on mono-, di-, and polysaccharides. (Good for diagrams and simple explanations)



Thank You

