SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

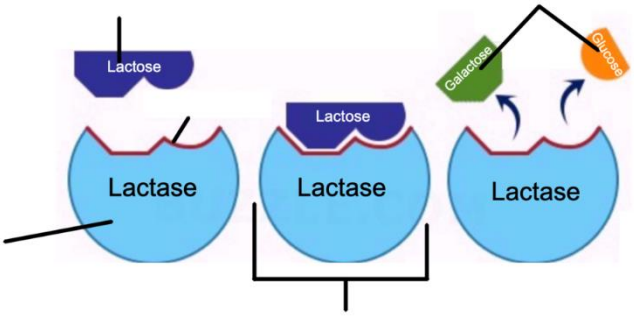
UNIT 1

COURSE NAME: MEDICINAL BIOCHEMISTRY

TOPIC: ENZYME

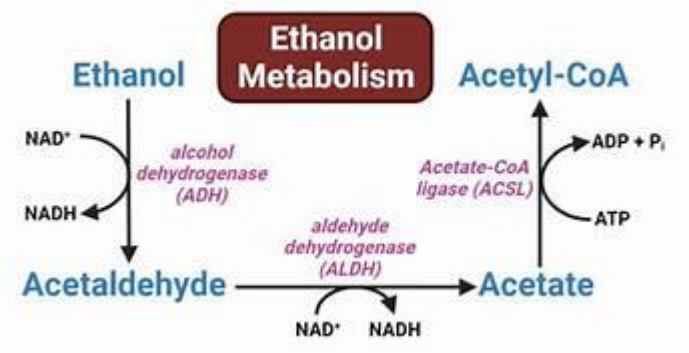
Case Study Question 1: Lactose Intolerance

A 30-year-old patient presents with recurrent abdominal cramps, gas, and diarrhea shortly after consuming dairy products like milk or ice cream. Laboratory tests confirm a deficiency in the enzyme responsible for breaking down lactose. Identify the enzyme involved, provide its systematic name and EC number according to IUPAC nomenclature, and explain how this deficiency affects digestion. Suggest potential management strategies.



Case Study Question 2: Methanol Poisoning Treatment

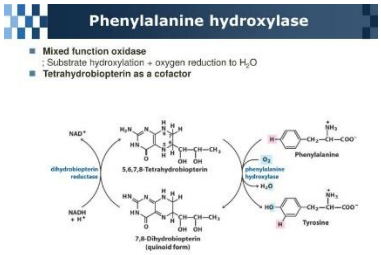
In emergency medicine, ethanol is sometimes administered to treat methanol poisoning. This involves competitive inhibition of a key enzyme that metabolizes alcohols. Name the enzyme, give its EC number and full nomenclature, and describe its role in the metabolism of both ethanol and methanol. Discuss why this treatment works and potential risks.



Case Study Question 3: Phenylketonuria (PKU) in Newborns

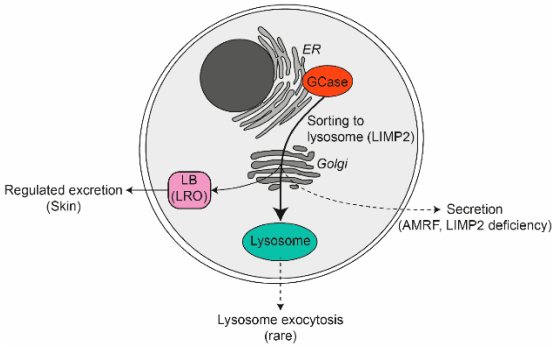
A newborn screening test reveals elevated phenylalanine levels in an infant, leading to a diagnosis of a genetic disorder. The deficient enzyme fails to convert phenylalanine to

tyrosine. Specify the enzyme's name, its EC classification and nomenclature, and explain the biochemical consequences if untreated. Outline screening and dietary interventions.



Case Study Question 4: Gaucher's Disease

A patient exhibits symptoms including hepatosplenomegaly, bone pain, and anemia due to accumulation of glucocerebroside in macrophages. This is caused by a lysosomal enzyme deficiency. Identify the enzyme, its EC number and nomenclature, and describe the reaction it catalyzes. Discuss enzyme replacement therapy as a treatment option.



Case Study Question 5: Catalase Activity in Bacterial Identification

In microbiology labs, a bubble test is used to differentiate Staphylococcus from Streptococcus bacteria. This test relies on an enzyme that decomposes hydrogen peroxide. Name the enzyme, provide its EC number and nomenclature, and explain the reaction mechanism. Discuss its biological significance in protecting cells from oxidative damage.