2023 Bi H1 Q12

Section: Metabolism and Survival

Topic: Metabolic Pathways

Question Summary

The question shows a sequence of reactions in a metabolic pathway, with enzymes 1-3 converting metabolite A -> B -> C -> D. It asks what happens during feedback inhibition.

Worked Solution

In a metabolic pathway, the final product can inhibit an enzyme earlier in the pathway to control its own production. This is known as feedback inhibition. Specifically, the end product (metabolite D) binds to the first enzyme (enzyme 1). This prevents enzyme 1 from converting more of substrate A into product B, reducing further production of metabolite D.

■ Answer: C — Metabolite D binds with enzyme 1

Revision Tips

• Feedback inhibition is a form of negative feedback in enzyme control.
• It prevents the overproduction of substances and helps maintain metabolic balance.
• The inhibitor (usually the final product) binds to an allosteric site

on the first enzyme.

• This changes the enzyme’s shape, preventing the substrate from binding to the active site.

• When the end-product level drops, inhibition is lifted and the pathway restarts.