

INKBIOLOGY FLASHCARDS

Enzymes and metabolic control

Unit B03 · 17 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions in mark-scheme wording, and the misconceptions that lose marks. These cards and each lesson's whole-lesson check run on the website with spaced-repetition scheduling, at inkphysics.co.uk/biology/flashcards.

DEFINITION

Define: Catalyst.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

Define: Activation energy.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

Define: Enzyme.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

Define: Active site.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

Define: Substrate.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

Define: Enzyme-substrate complex.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

Define: Specificity.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

SPOT THE ERROR

Say what is wrong with this claim:

Enzymes speed up reactions by giving them energy, a push to get them going.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

The minimum energy that colliding particles must have for a reaction to take place.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

A substance that increases the rate of a reaction by lowering its activation energy, and which is not used up in the process.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

The region of an enzyme, formed by its tertiary structure, to which the substrate binds.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

A globular protein that acts as a biological catalyst, with an active site complementary to its substrate.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

The temporary structure formed when a substrate binds to the active site.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

The molecule on which an enzyme acts.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

SPOT THE ERROR

An enzyme supplies no energy: it sits in solution at the same temperature as everything around it. It offers an alternative route with a lower activation energy, so a far larger fraction of molecules already have enough thermal energy to react.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

The property of an enzyme that it catalyses only one reaction, or one class of reaction, because only a substrate complementary to its active site can bind.

ENZYMES: WHAT A CATALYST CAN AND CANNOT DO

DEFINITION

Define: Initial rate.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

DEFINITION

Define: Limiting factor.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

DEFINITION

Define: Optimum.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

SPOT THE ERROR

Say what is wrong with this claim:

A denatured enzyme is one that has been switched off, so cooling it down should switch it back on.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

DEFINITION

Define: Competitive inhibitor.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME DOWN

DEFINITION

Define: Non-competitive inhibitor.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME DOWN

DEFINITION

Define: Allosteric site.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME DOWN

DEFINITION

Define: End-product inhibition.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME DOWN

DEFINITION

The factor that, of all those affecting a rate, is the one restricting it at that moment.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

DEFINITION

The rate of reaction at time zero, found from the gradient of the tangent to a progress curve at the origin.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

SPOT THE ERROR

Cooling reverses slowing, not denaturation. Below the optimum the molecules simply collide less often. Denaturation is the tertiary structure coming apart as hydrogen and ionic bonds break, and a cooled protein does not refold reliably into a working active site.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

DEFINITION

The value of a variable at which an enzyme's rate is highest.

FACTORS AFFECTING ENZYME RATE: TEMPERATURE, PH AND CONCENTRATION

DEFINITION

A molecule that binds to a site other than the active site, altering the enzyme's tertiary structure so that the active site is no longer complementary to the substrate.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME

DEFINITION

A molecule with a shape similar to the substrate that binds to the active site, preventing the substrate from binding.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME

DEFINITION

The inhibition of an enzyme early in a metabolic pathway by the final product of that pathway, so that the rate of the pathway matches demand.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME

DEFINITION

A binding site on an enzyme away from the active site, at which a regulatory molecule binds.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME

SPOT THE ERROR

Say what is wrong with this claim:

An inhibitor must be a poison, and a cell would never make one on purpose.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYMES DOWN

SPOT THE ERROR

Inhibition is how metabolism is regulated, not only how it is poisoned. Cells inhibit their own enzymes deliberately and reversibly to stop making what they already have in surplus, and ATP is doing most of that inhibiting right now.

INHIBITION: HOW CELLS, POISONS AND MEDICINES ALL TURN ENZYME