

2.1.4 Enzymes

- (a) the role of enzymes in catalysing reactions that affect metabolism at a cellular and whole organism level To include the idea that enzymes affect both structure and function.
- (b) the role of enzymes in catalysing both intracellular and extracellular reactions To include catalase as an example of an enzyme that catalyses intracellular reactions and amylase and trypsin as examples of enzymes that catalyse extracellular reactions.
- (c) the mechanism of enzyme action To include the tertiary structure, specificity, active site, lock and key hypothesis, induced-fit hypothesis, enzyme-substrate complex, enzyme-product complex, product formation and lowering of activation energy.
HSW1, HSW8
- (d) (i) the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme activity To include reference to the temperature coefficient (Q_{10}).
(ii) practical investigations into the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme activity An opportunity for serial dilutions *M0.1, M0.2, M0.3, M1.1, M1.3, M1.11, M3.1, M3.2, M3.3, M3.5, M3.6* **PAG4** HSW1, HSW2, HSW4, HSW5, HSW6, HSW8
- (e) the need for coenzymes, cofactors and prosthetic groups in some enzyme-controlled reactions To include Cl^- as a cofactor for amylase, Zn^{2+} as a prosthetic group for carbonic anhydrase and vitamins as a source of coenzymes.
PAG4
- (f) the effects of inhibitors on the rate of enzyme-controlled reactions. To include competitive and non-competitive and reversible and non-reversible inhibitors with reference to the action of metabolic poisons and some medicinal drugs, and the role of product inhibition **AND** inactive precursors in metabolic pathways (covered at A level only).
M0.1, M0.2, M0.3, M1.1, M1.3, M1.11, M3.1, M3.2, M3.3, M3.5, M3.6 **PAG4** HSW1, HSW2, HSW4, HSW5, HSW6, HSW8