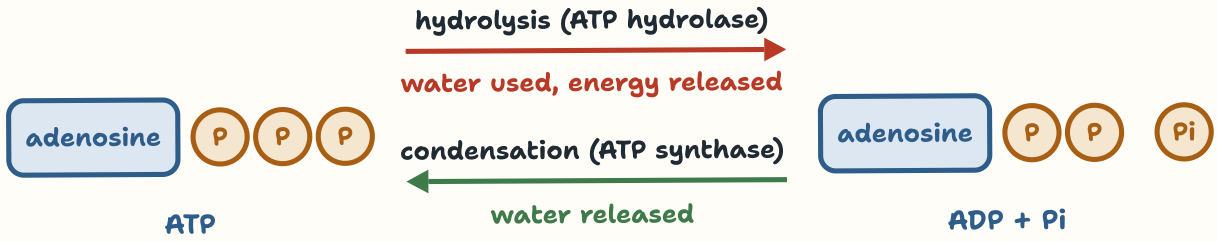
ATP: Structure, Hydrolysis and Resynthesis

ATP is hydrolysed to ADP and Pi to release energy, then rebuilt by condensation.

THE ATP CYCLE



Energy released drives reactions that need it, e.g. active transport, muscle contraction

Key terms

ATP	a nucleotide derivative made of ribose, adenine and three phosphate groups.
ATP hydrolase	the enzyme that catalyses the hydrolysis of ATP to ADP and Pi, releasing energy.
coupled reaction	the energy released by ATP hydrolysis drives a reaction that needs energy.
phosphorylation	Pi attaches to another compound, often making it more reactive.
ATP synthase	the enzyme that rebuilds ATP from ADP and Pi by a condensation reaction.

I can...

- [ ] ATP is a nucleotide derivative: ribose, adenine, three phosphates
- [ ] ATP hydrolysis to ADP and Pi is catalysed by ATP hydrolase
- [ ] Hydrolysis coupled to energy-requiring reactions
- [ ] Pi released can phosphorylate other compounds making them more reactive
- [ ] ATP resynthesised by condensation of ADP and Pi, catalysed by ATP synthase in photosynthesis or respiration

EXAM TRAP

Do not mix up the enzymes: ATP hydrolase breaks ATP down, ATP synthase builds it up. Energy is released, never made, and ATP is an immediate energy source, not a long-term store.

5 marks: what earns them

1. ATP is a nucleotide derivative made of ribose, adenine and three phosphate groups
   Not: deoxyribose; two phosphates
2. ATP is hydrolysed to ADP and inorganic phosphate (Pi) by ATP hydrolase, releasing energy
   Not: synthase for hydrolysis; energy is made
3. Energy released is coupled to / used in an energy-requiring reaction
   Not: ATP stores energy long term
4. Pi can phosphorylate another compound, making it more reactive
   Not: "Pi gives energy" alone
5. ATP is resynthesised from ADP and Pi by condensation, catalysed by ATP synthase (in respiration or photosynthesis)
   Not: hydrolysis for resynthesis

Remember

Hydrolysis breaks, condensation builds.

Hydrolase breaks ATP down; synthase builds it up.

ATP = ribose + adenine + 3 phosphates.

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