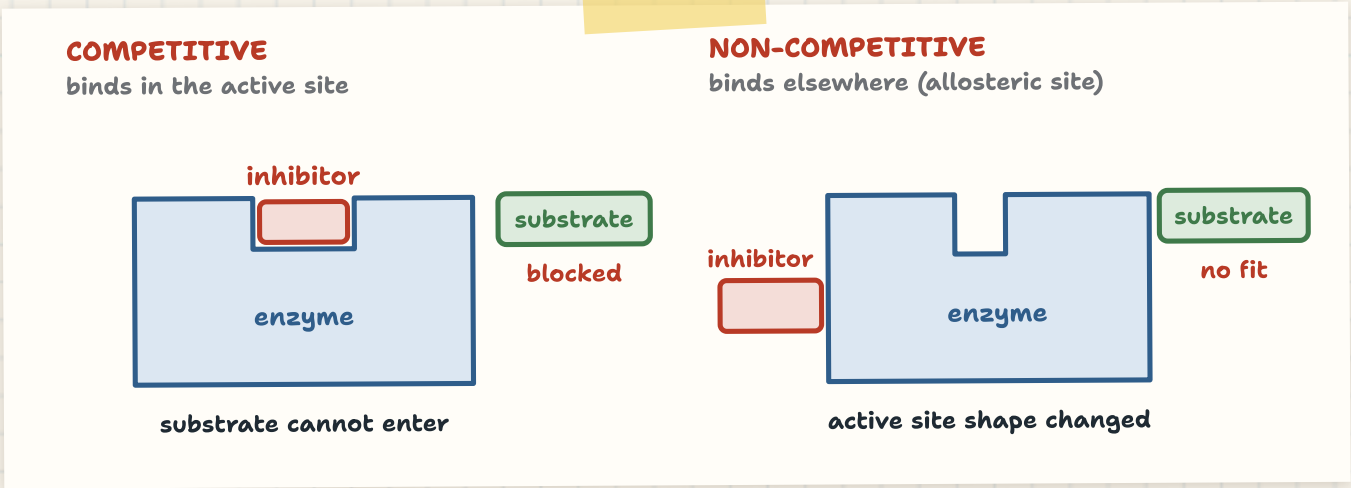
Competitive vs Non-Competitive Inhibitors

Competitive inhibitors block the active site; non-competitive ones change its shape from elsewhere.



Key terms

inhibitor	reduces the rate of the reaction by blocking it.
competitive inhibitor	has a shape similar to the substrate, so fits the active site.
non-competitive inhibitor	binds to a different site, not the active site.
allosteric site	where a non-competitive inhibitor binds.
tertiary structure	binding at the allosteric site changes it, so the substrate no longer fits.
maximum rate	reached again with more substrate if competitive; stays lower if non-competitive.

I can...

- [ ] Effect of competitive and non-competitive inhibitor concentration on rate

EXAM TRAP

Say where it binds: competitive, the active site; non-competitive, a different site that changes the active site's shape.

4 marks: what earns them

1. Competitive inhibitor has a shape similar to the substrate and binds to the active site, so fewer enzyme-substrate complexes form
   Not: 'binds to the enzyme' with no site; 'same shape as the enzyme'
2. Increasing substrate concentration makes substrate more likely to bind than the inhibitor, so rate increases (towards the maximum rate)
   Not: 'more substrate removes the inhibitor'; 'more substrate speeds up rate' with no competition
3. Non-competitive inhibitor binds to a different site (allosteric site), changing the tertiary structure so the shape of the active site changes and substrate can no longer bind
   Not: 'binds to the enzyme' alone; 'changes the shape of the enzyme' with no active site
4. Increasing substrate concentration does not overcome this, because fewer functional enzyme molecules are available, so the maximum rate is lower
   Not: 'substrate cannot reach the active site'; 'enzymes run out of substrate'

Remember

Competitive: same spot, more substrate wins.
Non-competitive: different spot, shape changes.
More substrate does not beat non-competitive.

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