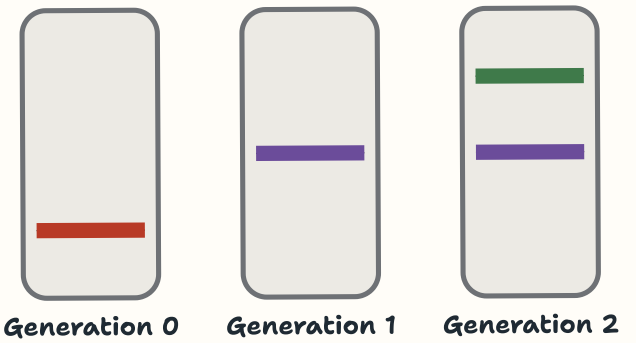
Meselson and Stahl Experiment Explained

Heavy and light nitrogen showed that DNA replicates semi-conservatively.

DENSITY GRADIENT TUBES



- light band (^{14}N)
- intermediate band
- heavy band (^{15}N)

Gen 1 rules out conservative

Gen 2 rules out dispersive

Only semi-conservative fits

Key terms

semi-conservative	each new molecule keeps one old strand and gains one new strand.
conservative model	the original molecule stays whole and a completely new molecule is made.
dispersive model	the strands break up, and each new molecule is a patchwork of old and new sections.
nitrogen isotopes	nitrogen-14 is light and nitrogen-15 is heavy; DNA made with heavy nitrogen is denser.
density gradient	a solution whose density increases from top to bottom; each type of DNA settles where its density matches.

I can...

- [ ] Evaluate the work of scientists in validating the Watson-Crick model of DNA replication

EXAM TRAP

In generation 2, semi-conservative gives one intermediate band and one light band. A heavy band and a light band is the conservative prediction.

4 marks: what earns them

1. Each DNA molecule contains one heavy strand and one light strand (intermediate density)
   Not: the DNA is half heavy (no reference to strands or molecules)
2. The conservative model predicts one heavy band and one light band (two bands), which was not seen, so it is ruled out
   Not: conservative is wrong (no reason given)
3. The original (parent) strands stay heavy and the new strands are made from light nitrogen
   Not: the DNA changes from heavy to light
4. This supports semi-conservative replication, where each new molecule keeps one original strand
   Not: dispersive or conservative supported; generation one rules out dispersive

Remember

Gen 0: heavy. Gen 1: intermediate. Gen 2: intermediate + light.

Gen 1 rules out conservative; gen 2 rules out dispersive.

Heavy nitrogen labels the old strands.

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