

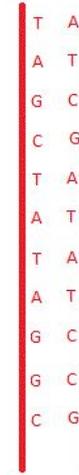
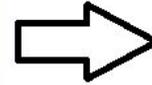
Semiconservative Replication

Color code or highlight your notes!

DNA replication that produces two copies, each containing one of the **original strands** and one **new strand**.



Parent Strand



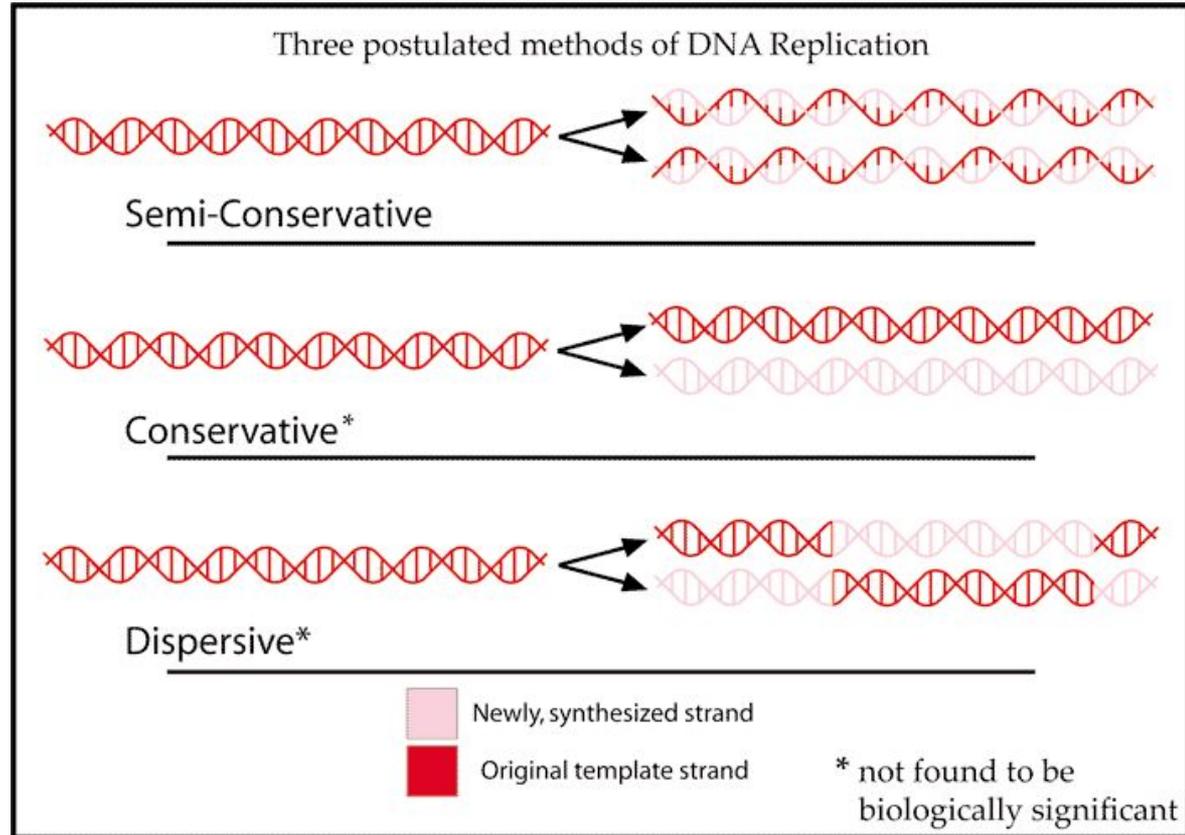
Contains one parent strand and one newly synthesized complimentary strand

+



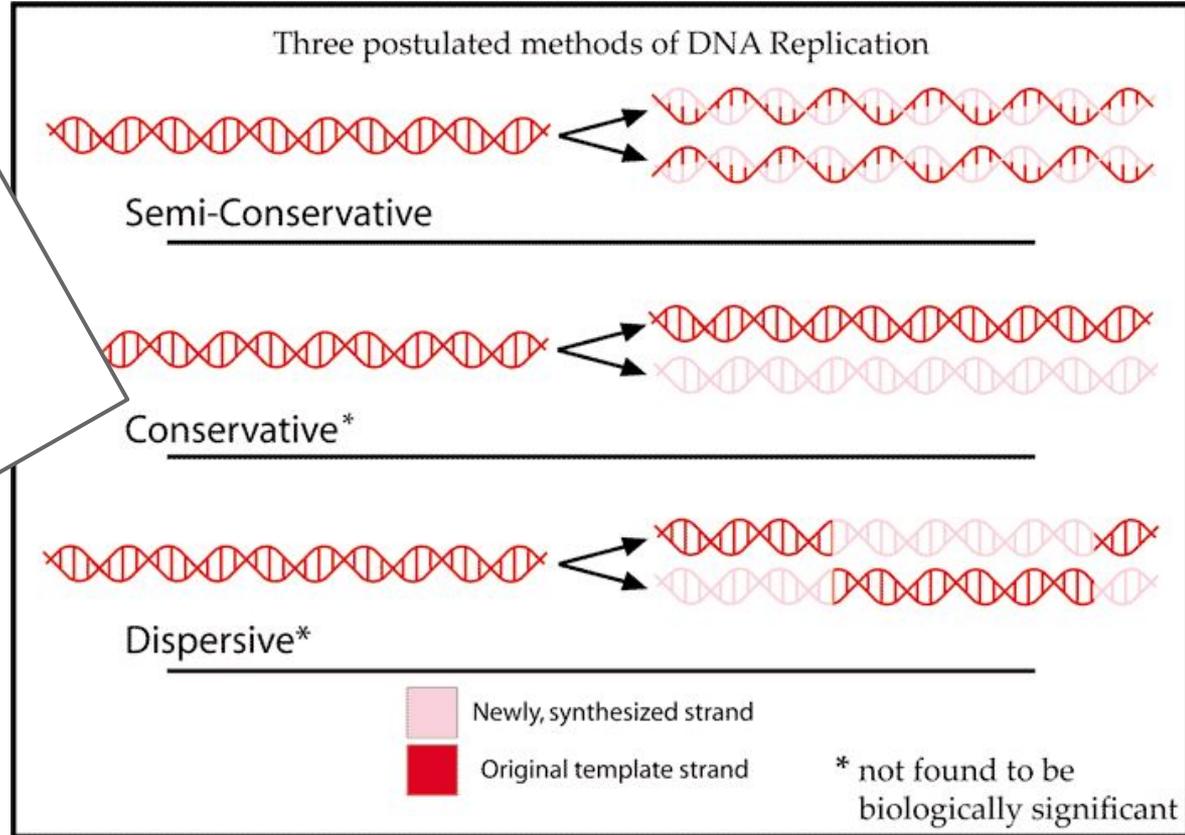
Contains second parent strand and one newly synthesized complimentary strand

Alternative to semi-conservative



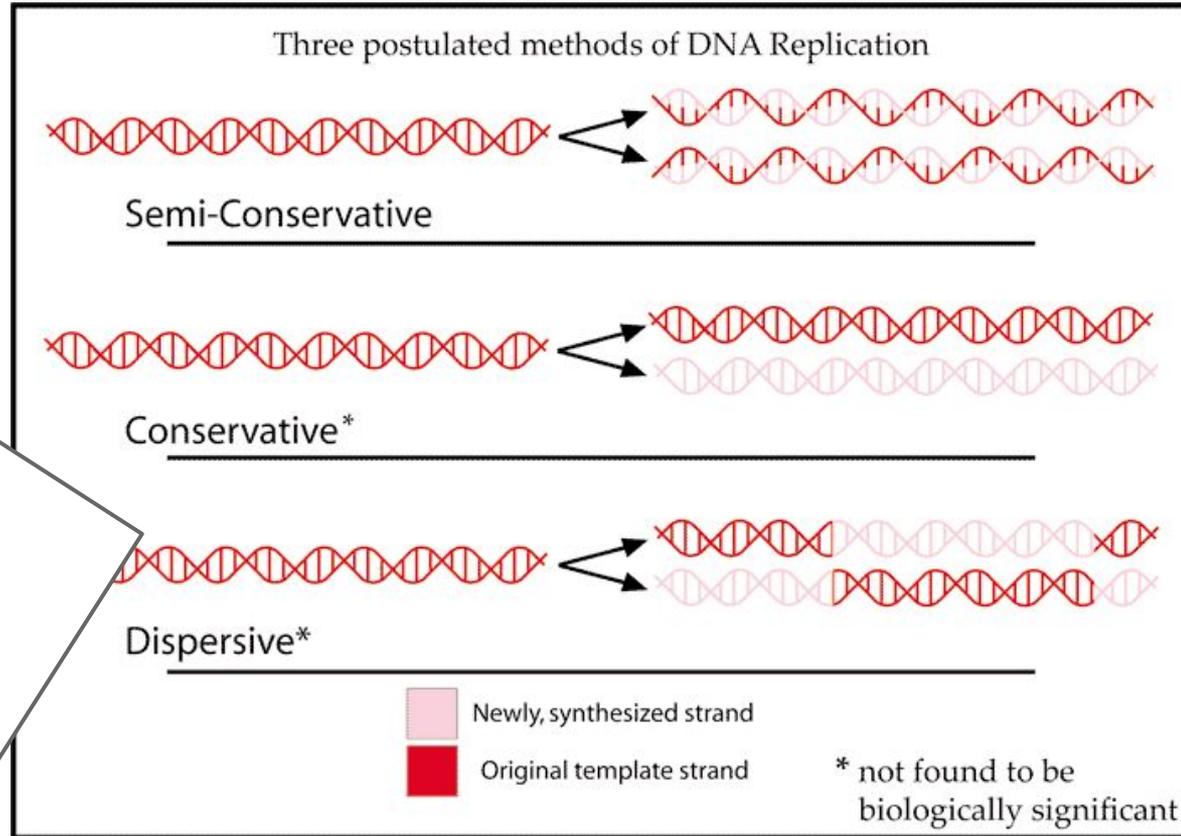
Alternative to semi-conservative

Conservative replication leaves the two original template DNA strands together in a double helix and produces a copy composed of two new strands containing all of the new DNA base pairs.



Alternative to semi-conservative

Dispersive replication produces copies of the DNA containing distinct regions of DNA composed of either both original strands or both new strands.



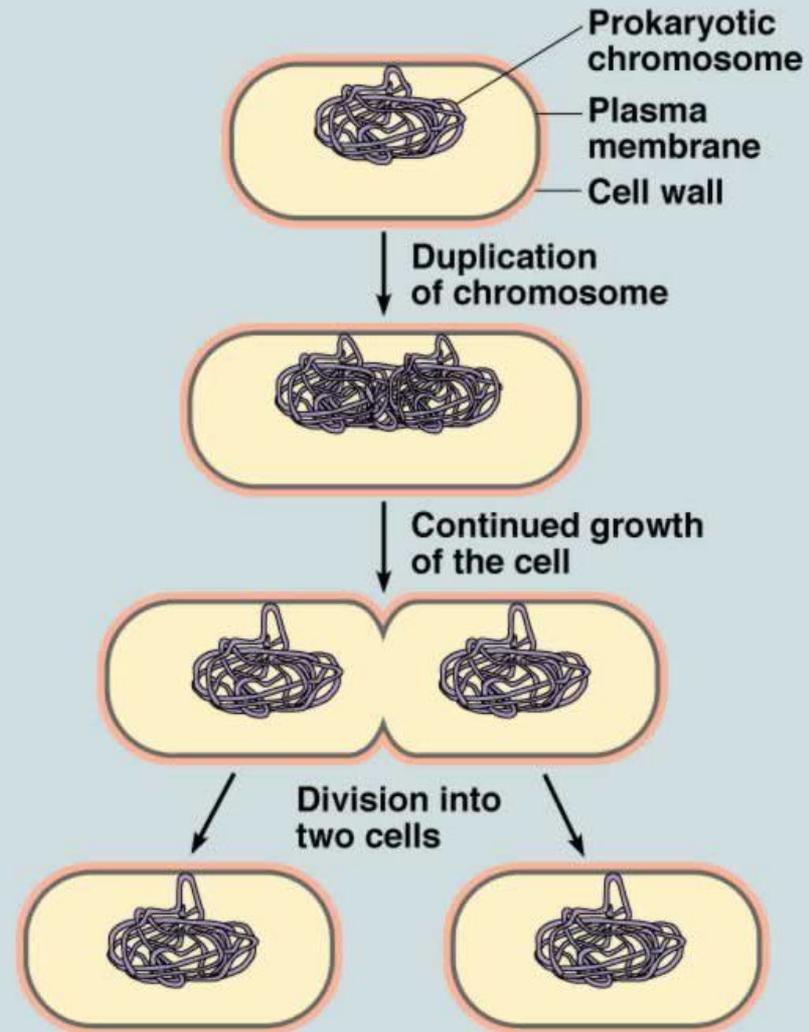
Is DNA Replication conservative, dispersive or semi-conservative?

[Meselson and Stahl experiment](#) (1958)

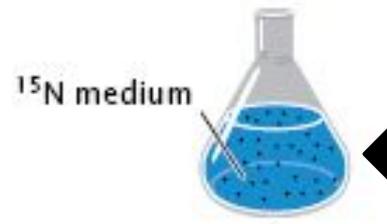


Binary Fission

Why are bacteria useful when studying DNA replication?



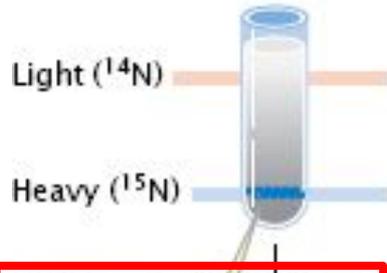
Start:



Allow many generations of E.coli bacteria to divide only in the presence of “heavy” nitrogen (^{15}N).

All of their DNA will now contain this “heavy” nitrogen in the bases.

Spin

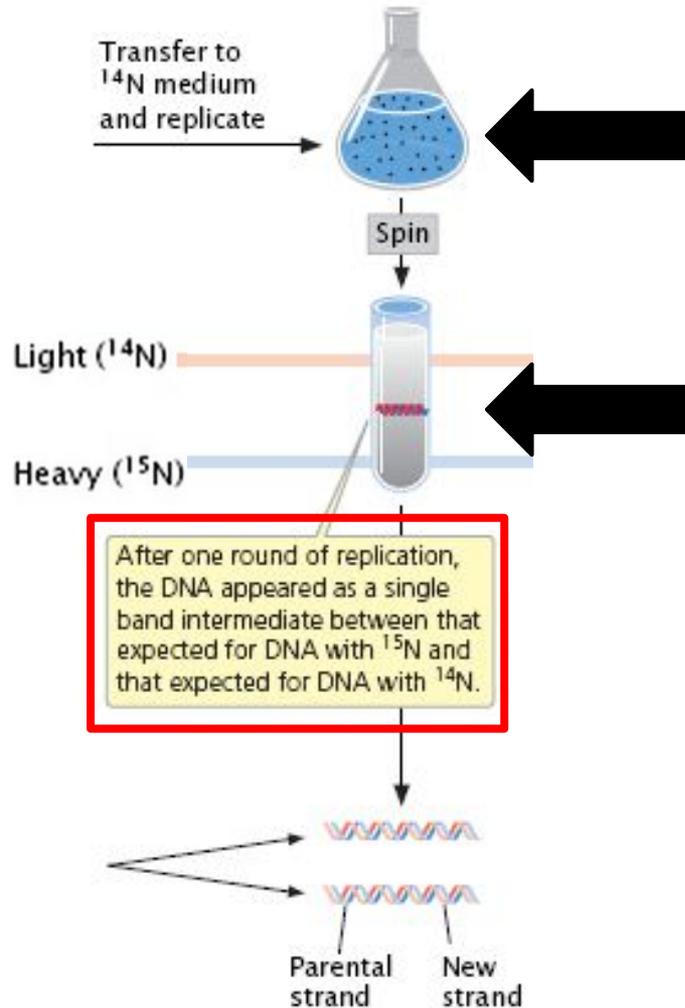


When spun in a centrifuge, **all** the DNA sunk to the bottom of the tube because it was **all** “heavy.”

DNA from bacteria that had been grown on medium containing ^{15}N appeared as a single band.



Cycle 1:



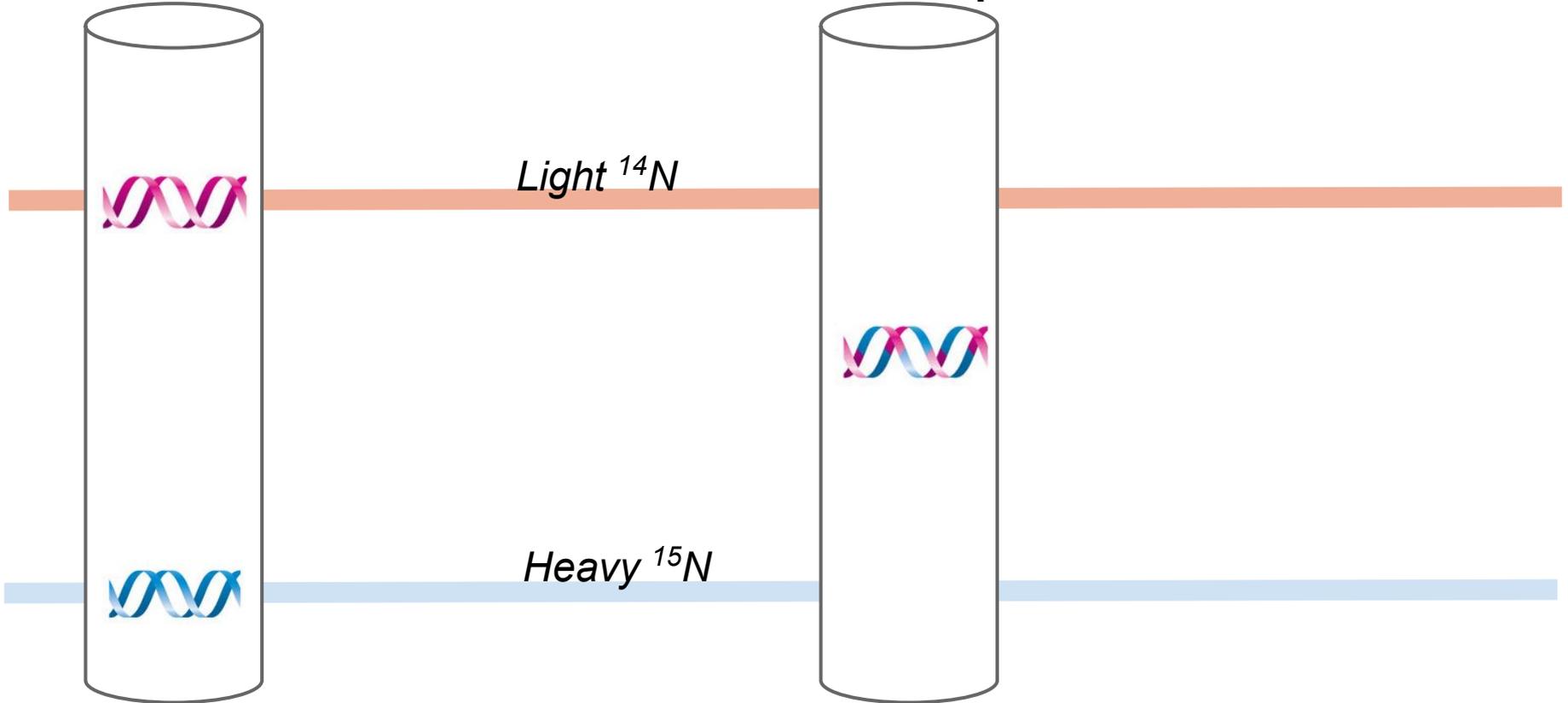
The bacteria were transferred to a solution with light nitrogen (^{14}N) and allowed to divide.

When spun in a centrifuge, **all** the DNA was in a single band above where the ^{15}N band had been.

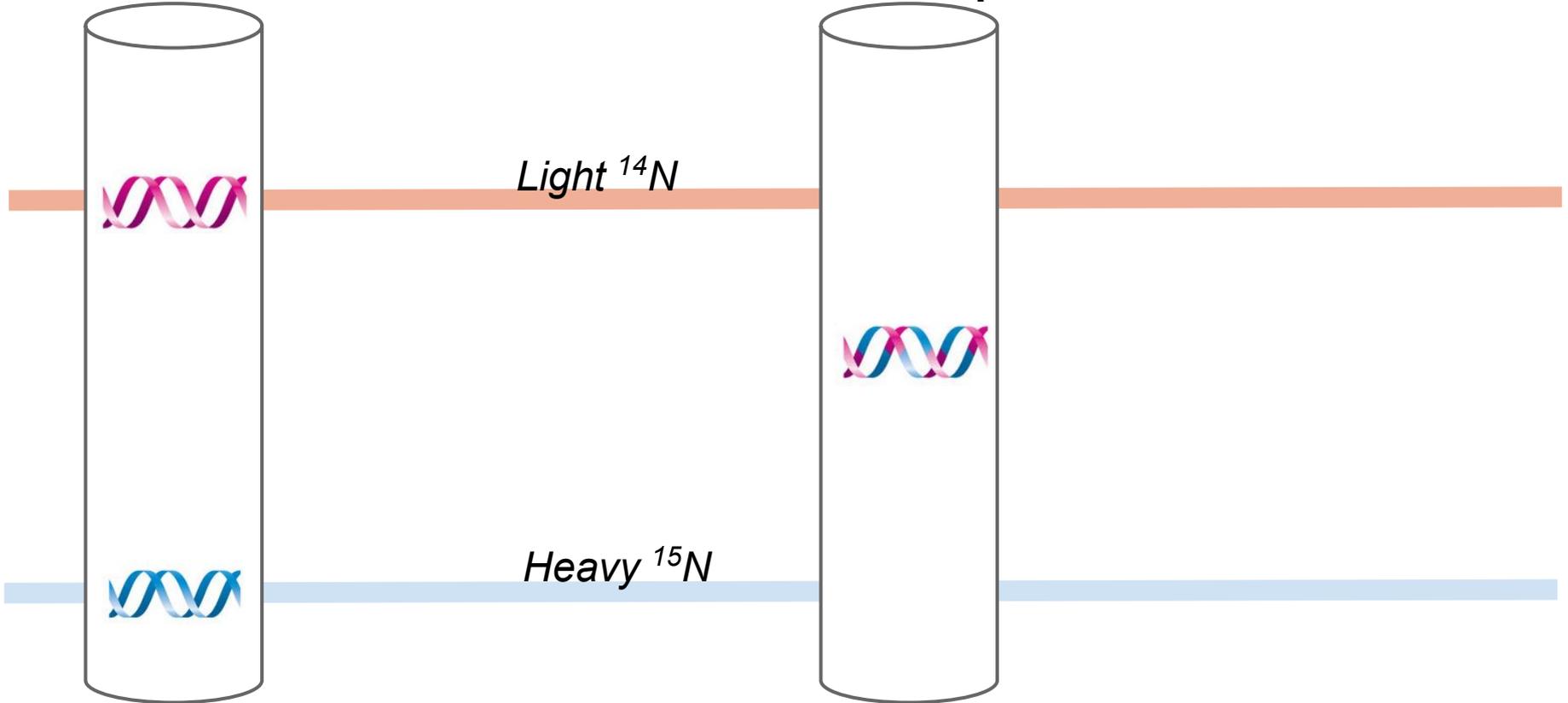
*On the white boards,
draw what would
have been seen after
Cycle 1 if DNA replication
was **conservative** or
dispersive.*



If conservative...

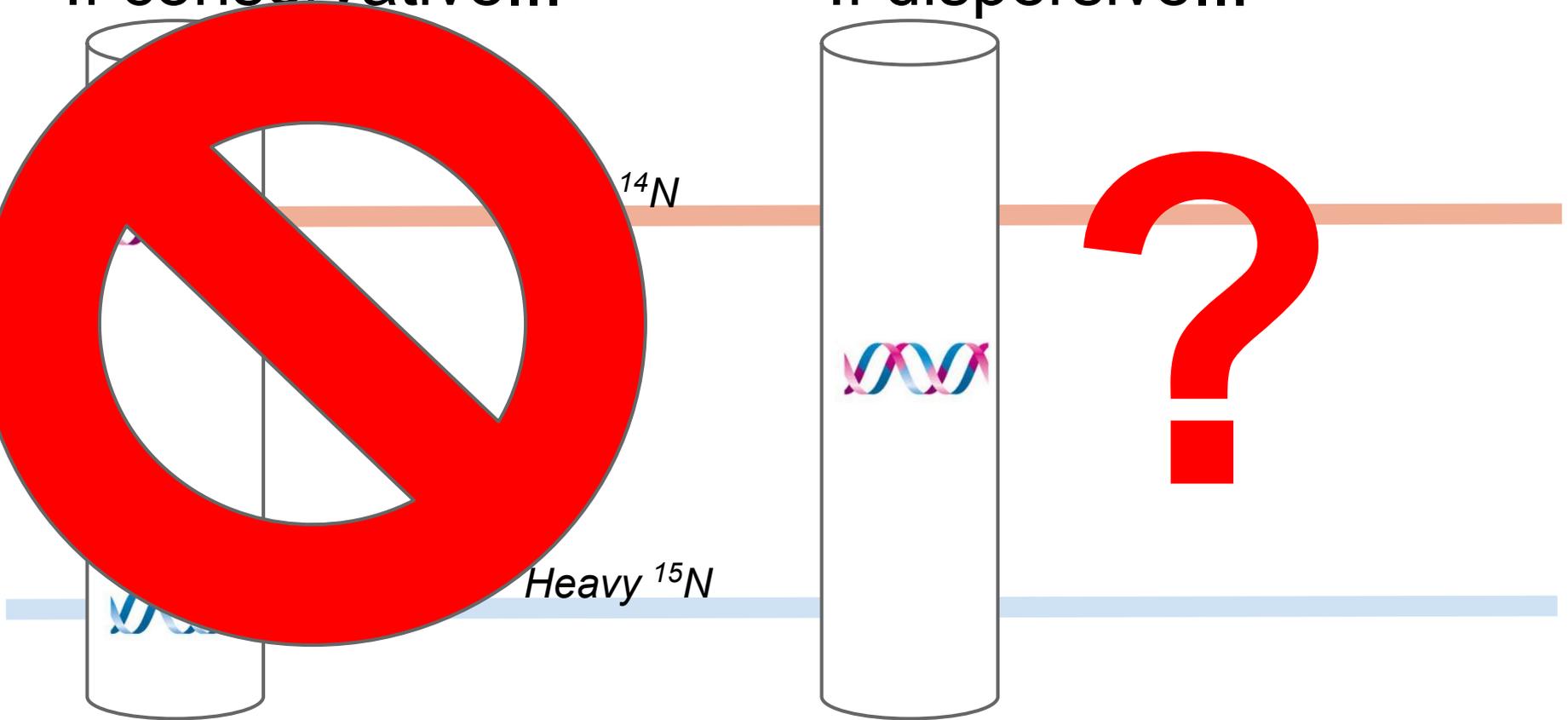


If dispersive...

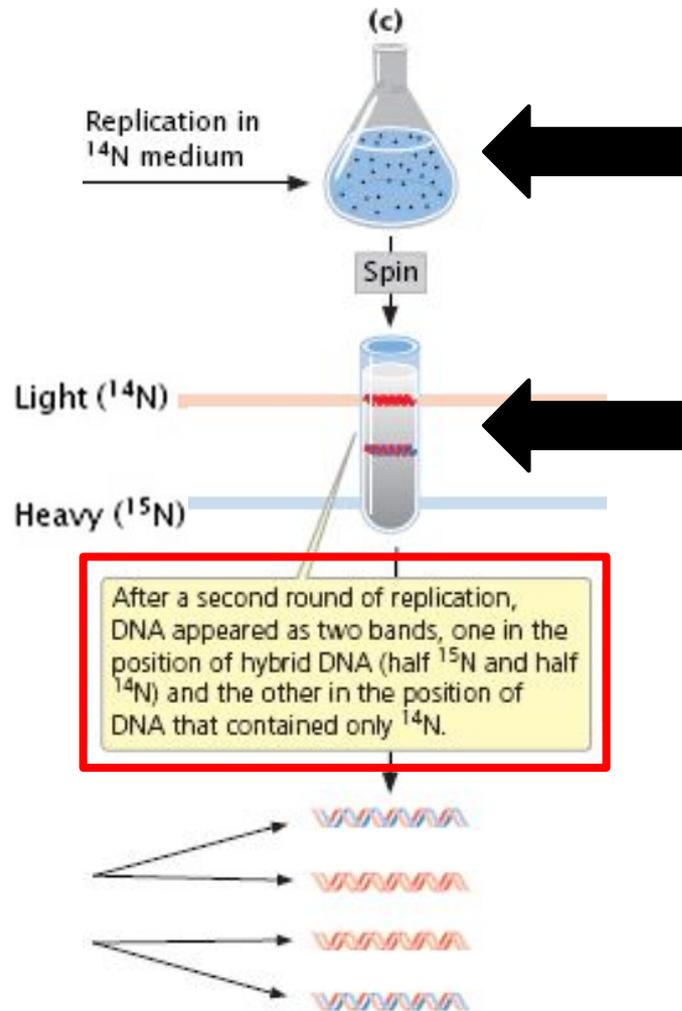


If conservative...

If dispersive...



Cycle 2:



The bacteria continued to grow with light nitrogen (^{14}N) and allowed to divide.

When spun in a centrifuge, **half** the DNA was in a band above where the ^{15}N band had been and half the DNA was above that.

*On the white boards,
draw what would
have been seen after
Cycle 2 if DNA replication
was **dispersive**.*



If dispersive...

Light ^{14}N



Heavy ^{15}N

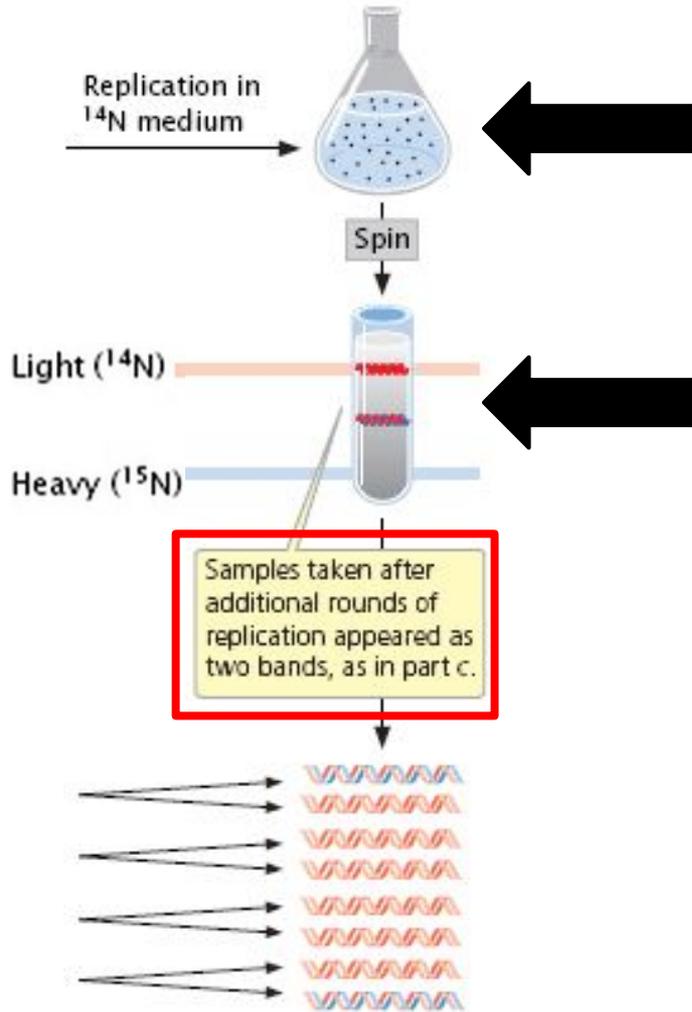
If dispersive...

Light ^{14}N

Heavy ^{15}N



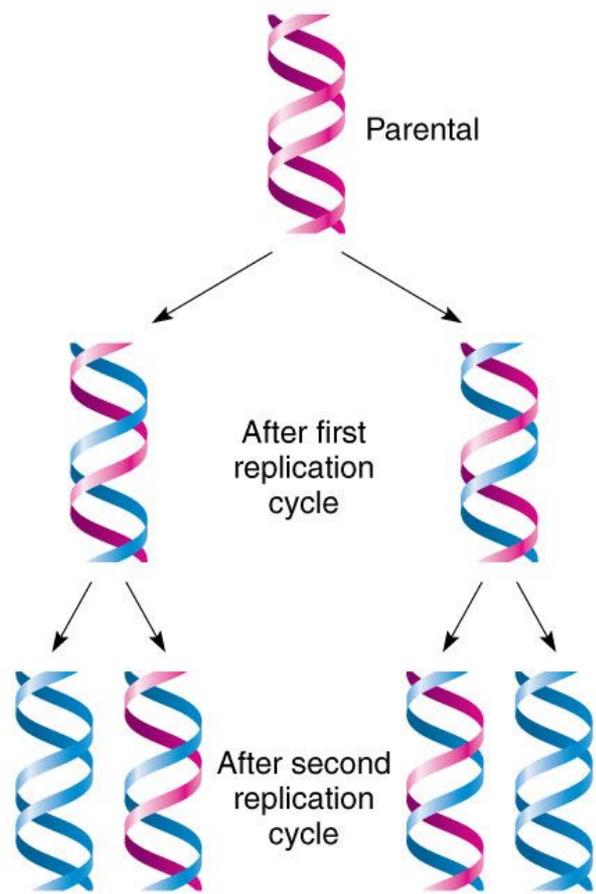
Cycle 3:



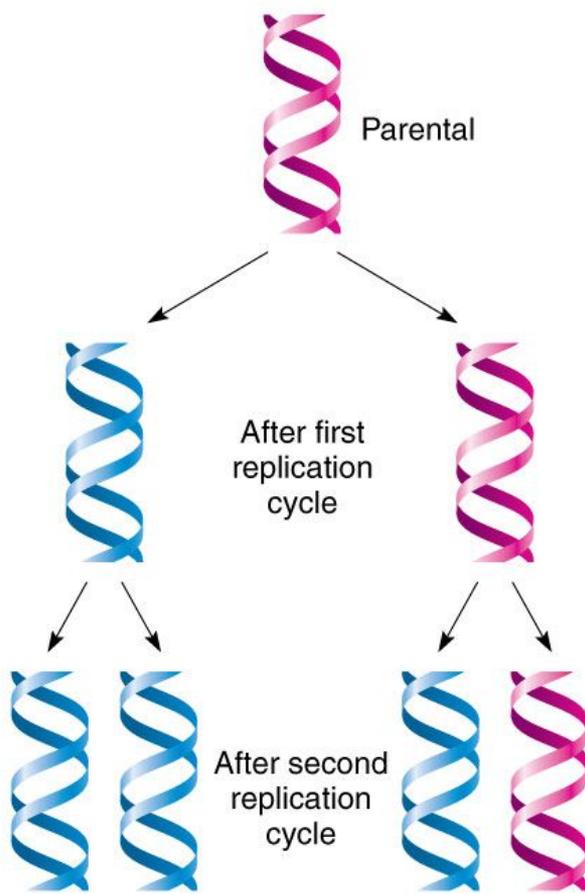
The bacteria continued to grow with light nitrogen (^{14}N) and allowed to divide.

When spun in a centrifuge, **some** DNA was in a band above where the ^{15}N band had been and **more** of the DNA was above that.

a) Semiconservative model



b) Conservative model



c) Dispersive model

