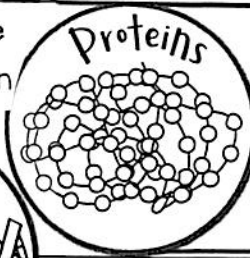


Extension : History of DNA

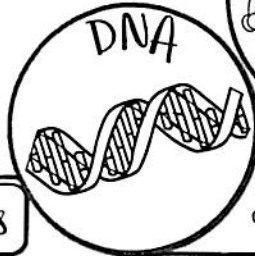
Name: _____

What is the genetic information molecule?

Early in the 20th century, what substance within cells that was carrying information from generation to generation was unknown. They suspected it was either proteins or DNA.



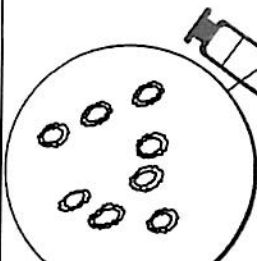
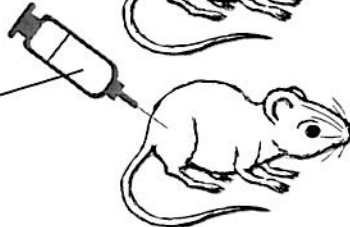
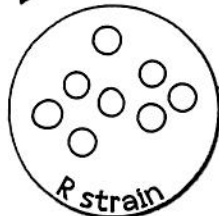
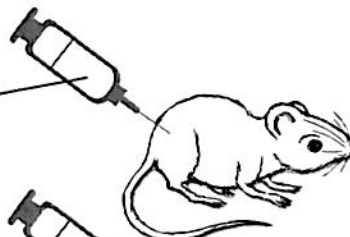
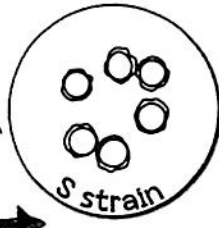
Proteins seemed like the best place for genetic information to be stored, because of all the possibilities with 20 different subunits (amino acids).



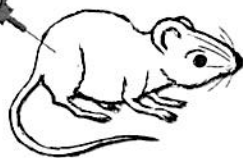
DNA seemed less likely because it is made up of only 4 different subunits (nucleotides).

Frederick Griffith, 1928

• Studied R (not deadly) and S (super deadly) pneumococcal cell strains that were causing disease.
What happened when injected with S cells?



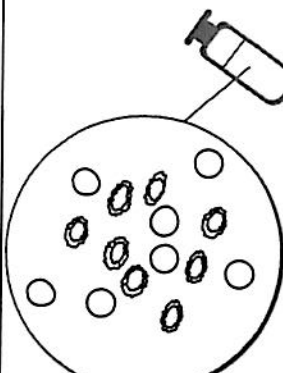
Heat Killed S Strain



What happened when he heated the S strain cells and injected it into mice?

What occurred when he injected heated S strain cells and R strain cells?

His conclusion?



Heat killed S Strain & live R Strain

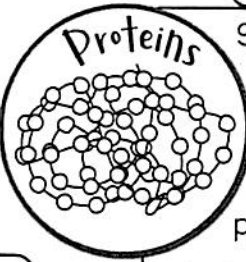
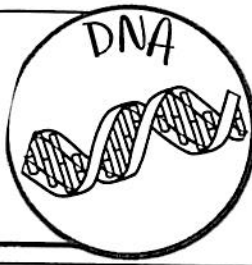


Transforming Principle?

Name: _____

After Griffith's Experiment

Scientists didn't know really what happened to DNA when you heat it.



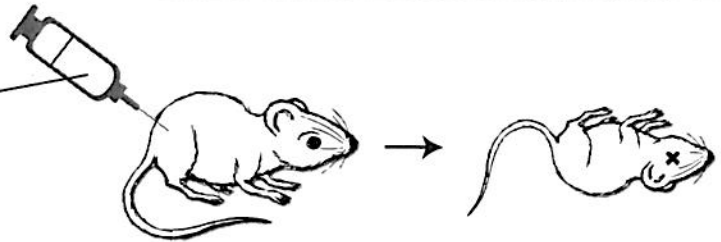
Scientists knew that heating proteins almost always denatured them and made them unable to function. Proteins are looking less likely to be the transforming principle.

Oswald Avery and colleagues, 1944

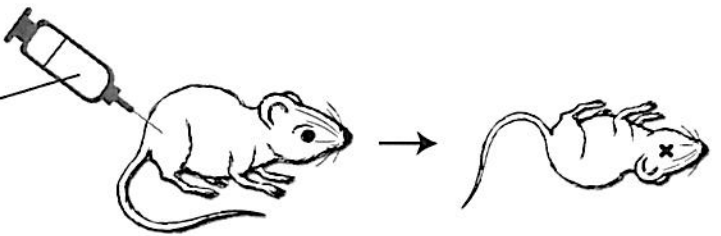
- Wanted to test out if the "transforming principle" was DNA or Proteins. What did they do with the heat - killed S strain?

What was being injected for each situation?

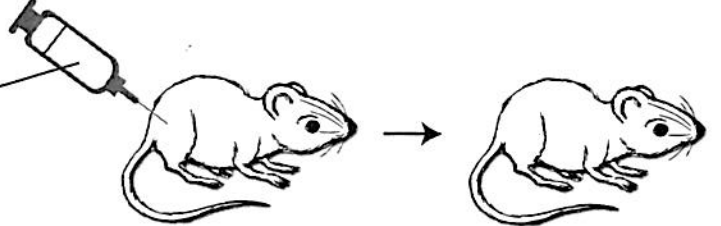
[Empty box for injection description]



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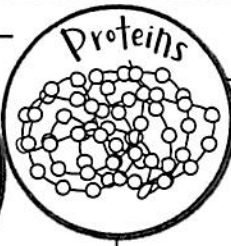
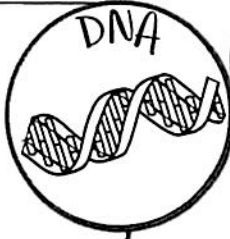


Conclusion:

DNA is the Genetic Information

Name: _____

More people started looking at DNA as being important



Another Experiment was Needed to Prove

After Avery's experiment, some scientists still claimed that protein was responsible for transmitting genetic information. They said his samples could have been contaminated with a protein that was not denatured by heat or destroyed by protease.

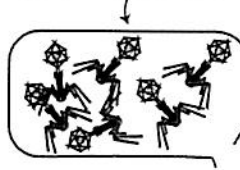
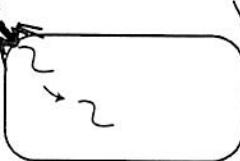
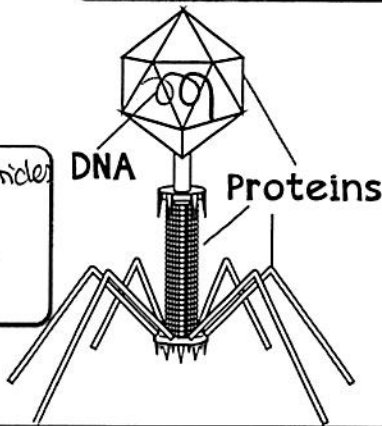
What else scientists knew at the time:

What is a bacteriophage?

Proteins are made of: C, H, O, N, S

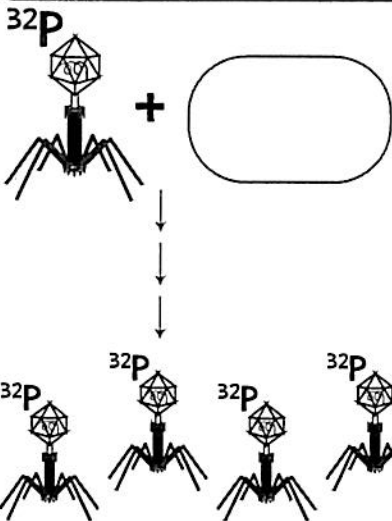
What does a bacteriophage do to a cell? what does this mean about the "instructions" it passes on?

DNA nucleotides made of: C, H, O, N, P

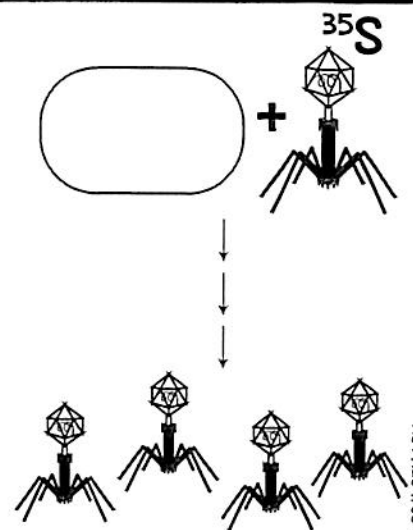


- If you run the sample through a blender and centrifuge, you can separate the bacterial cells from the outer shell/coat of the phage in a centrifuge tube.

Alfred Hershey and Martha Chase, 1952



What did they do with phosphorus & sulfur?



Results & Conclusion:

Protein is NOT

Name: _____

Erwin Chargaff, 1950

Scientists at this time knew DNA was made of nucleotides, but they did not know what DNA looked like.



What did Chargaff observe?

Maurice Wilkins and Rosalind Franklin

What did they do and what did they discover?



James Watson and Francis Crick, 1953

What did they do and what did they discover?



© Bethany Lau

**DNA is a
Double
Helix**

Watson, Crick,
and Wilkins

Nobel Prize in Physiology or Medicine, 1962

received a Nobel Prize for their discoveries. Franklin did not. Even if they had acknowledged all she did, she could not share the Nobel Prize because she passed away in 1958 from cancer. Nobel Prizes can only be awarded to living individuals.