12-1 Identifying the Substance of Genes

Bacterial Transformation

* To understand genetics scientists had to understand the of the gene itself
  + Scientists wanted to identify the

* Fredrick was trying to figure out what made people sick, specifically what caused
* Griffith isolated from mice of the same
  + A virulent -Strain ( )
  + A Non-virulent -Strain ( )
* What happened when Griffith injected mice with the S-Strain?
* What happened when Griffith injected mice with the R-Strain?
* Big question was what caused the mice to get pneumonia and die?
* What did he think was the culprit? Page 338
* Experiment 1
* Heated the to kill the bacteria and injected them (heat the proteins)
* Mice survived suggesting that a
* Experiment 2
* Took a mixture of the heat killed S-Strain and the harmless R-Strain and injected
* What did he expect to happen?

Bacterial Transformation

* To his surprise, the mice got pneumonia and died – why?
* The lungs of the mice were filled with which type of bacteria?
* S-Strain
* Transformation🡪 The process causing one type of
* What did he hypothesize?

Molecular Cause of Transformation

* A group of scientists led by wanted to determine the molecule in the heat killed bacteria was the most important in the
* Avery took (proteins, lipids, RNA) out of the heat killed bacteria, them, and transformation – not responsible
* One more time Avery took out and destroyed it. Now, transformation – DNA was the factor to genetic information

Bacterial Viruses

* More proof was needed to convince the science community. Two scientists, Alfred and Martha started the same work but now using
* Bacteriophage – a that infects by changing the of the bacteria. Contains DNA protected by a
* Hersey and Chase used these viruses to identify whether it was a

Harley – Chase Experiment

* In the test, the pair in cultures containing radioactive as markers
* Why did they chose these?
* If they found a certain in the bacteria, they knew that was
* What did they find?
* What was their conclusion?

Role of DNA

* The DNA that makes up genes must be capable of storing, copying, and transmitting the genetic information

1) Storing Information

* Somewhere in the of organisms, the genes for color, shape, etc, have to be
* Similar to an

2) Copying Information

* DNA must be able to be before cell

3) Transmitting Information

* Mendel showed that are
* DNA must carefully be and passed during cell