

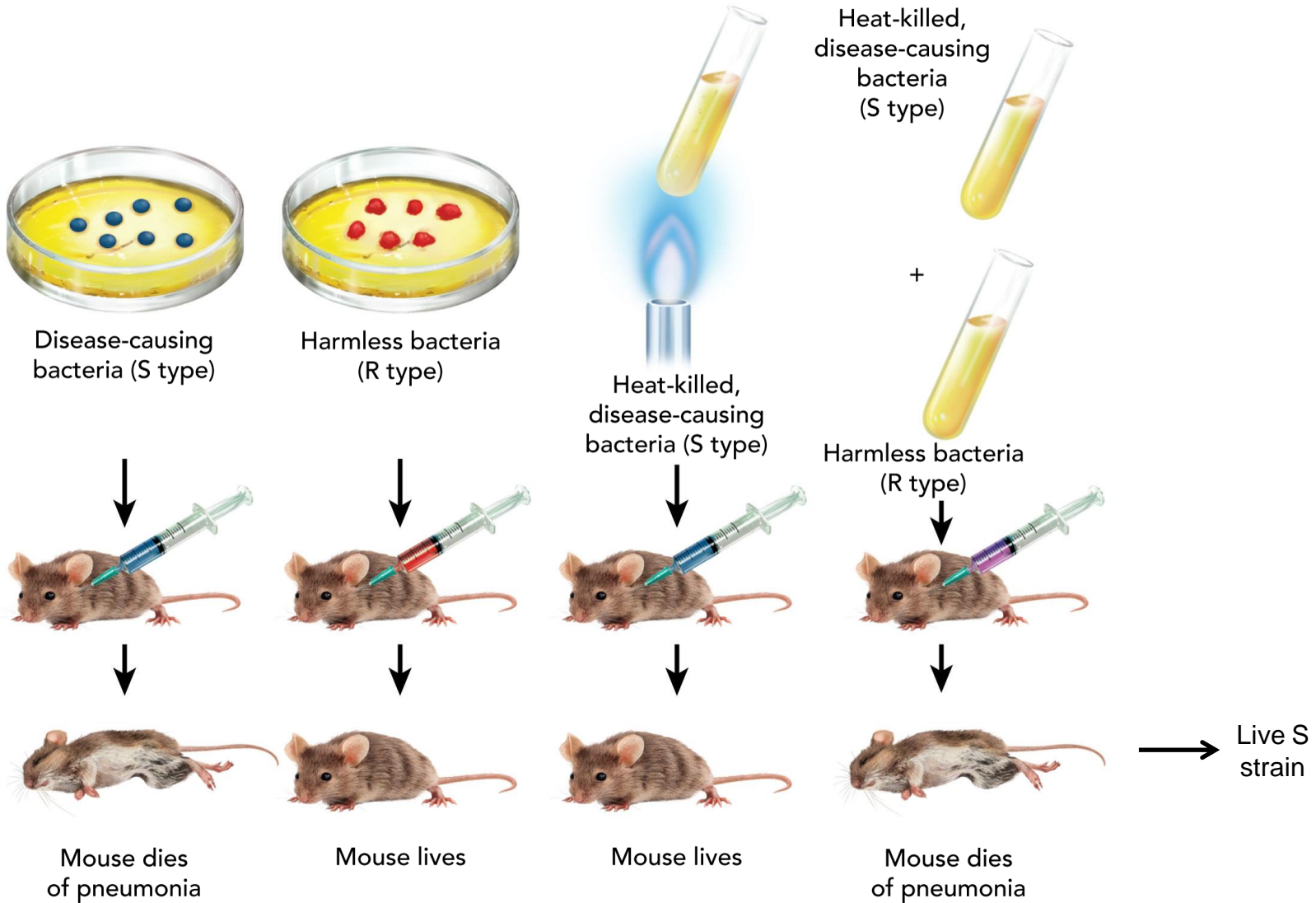
Identifying the Substance of the Gene



Griffith's Experiments

- Frederick Griffith
 - 1928 – British scientist was investigating how types of bacteria produce pneumonia (lung disease)
 - Identified “S” type – smooth edged colonies and “R” type – rough edged colonies
 - S type – disease-causing bacteria
 - R type – harmless bacteria
 - Injected it into mice to see what would happen.
 - **Transformation:** process in which one strain of bacteria is changed by a gene or genes from another strain of bacteria
 - He concluded that the transforming factor had to be a gene.

Griffith's Experiments



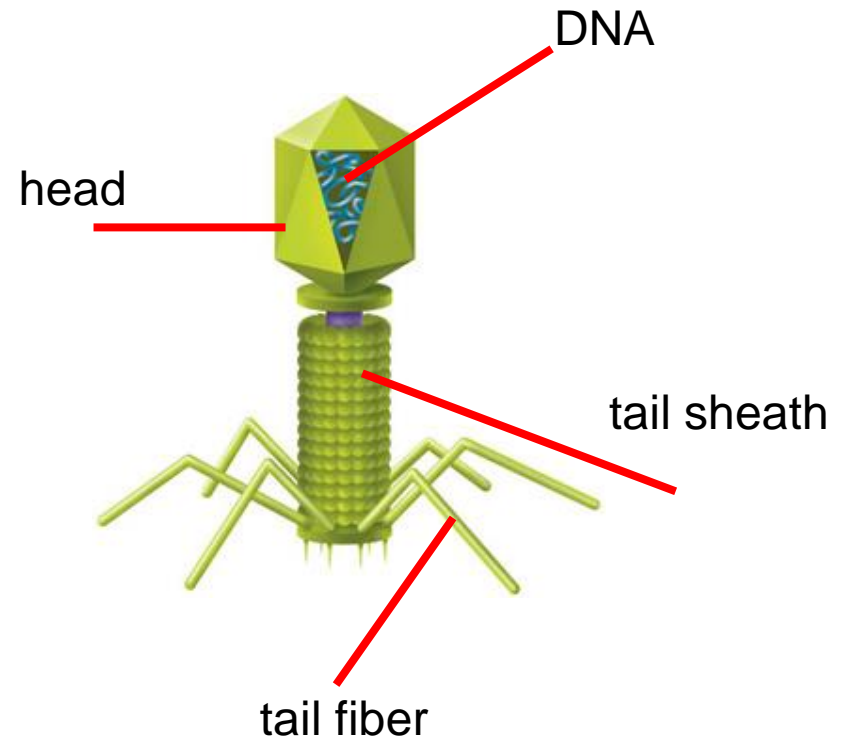
Avery's Experiments

- Oswald Avery
 - In 1944, Canadian biologist wanted to identify the molecule that caused the transformation
 - Made mixtures with enzymes that destroyed proteins, lipids, carbohydrates, and RNA. Transformation still occurred.
 - Tried one more time with DNA and transformation did not occur. DNA was the transforming factor.
 - Scientists discovered that the nucleic acid DNA stores and transmits genetic information from one generation of bacteria to the next.
 - This provided evidence that genes were made of DNA.

Bacterial Viruses

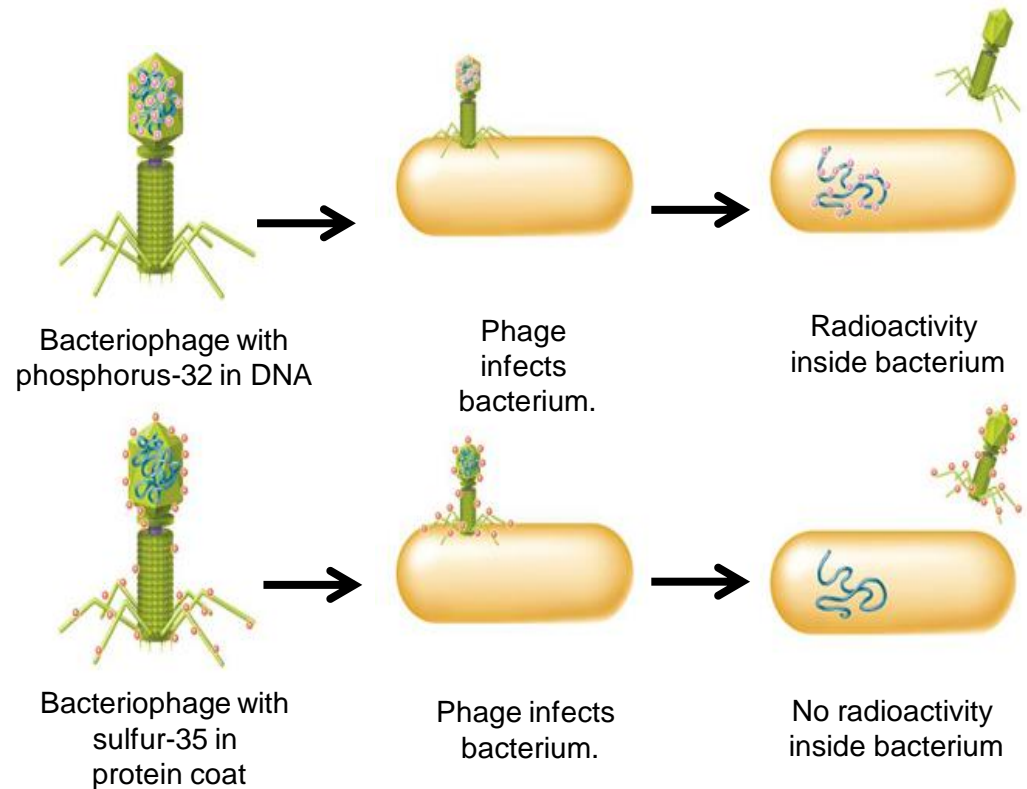
Bacteriophage: a kind of virus that infects bacteria

- These viruses attach to the surface of a bacteria and inject its DNA into it.
- Once inside, the viral genes produce new bacteriophages, which gradually destroy the bacterium
- When the cell splits, new viruses burst out.



Hershey-Chase Experiment

- Alfred Hershey and Martha Chase
 - In 1952, American scientists that confirmed the genetic importance of DNA
 - <https://www.youtube.com/watch?v=YI3tsmFsrOg&t=26s>



- Hershey and Chase's experiment with bacteriophages confirmed Avery's conclusion that DNA was the genetic material.
- DNA makes up the genetic material of all living cells

The Role of DNA

- DNA must be capable of storing and copying genetic information, as well as putting that information to work in gene expression
- DNA is the molecule of heredity that stores genetic information
- Genes control development
- DNA has to make a precise copy without losing information
- Cells must take the information in DNA and put it to work

