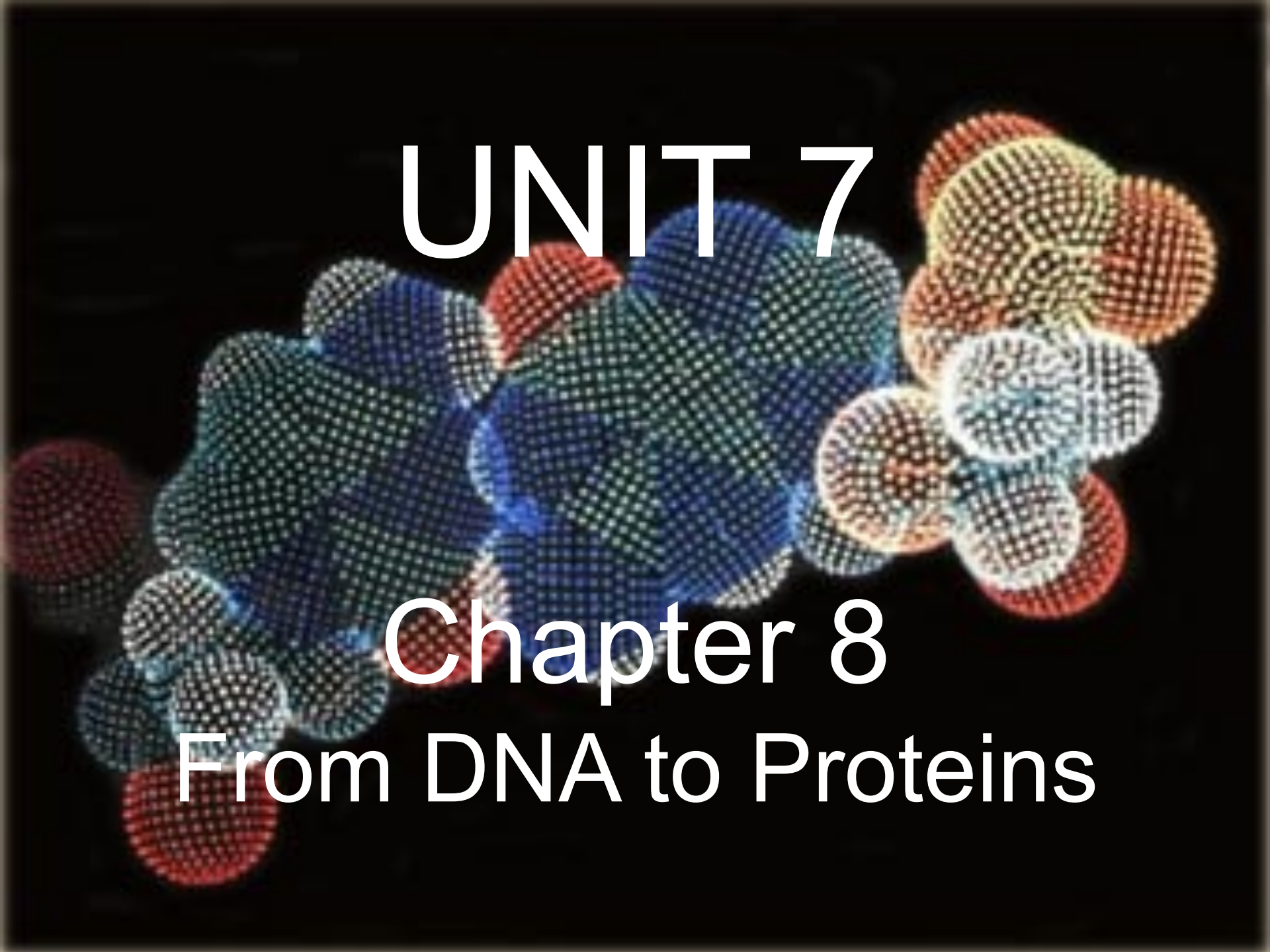


UNIT 7

Chapter 8
From DNA to Proteins

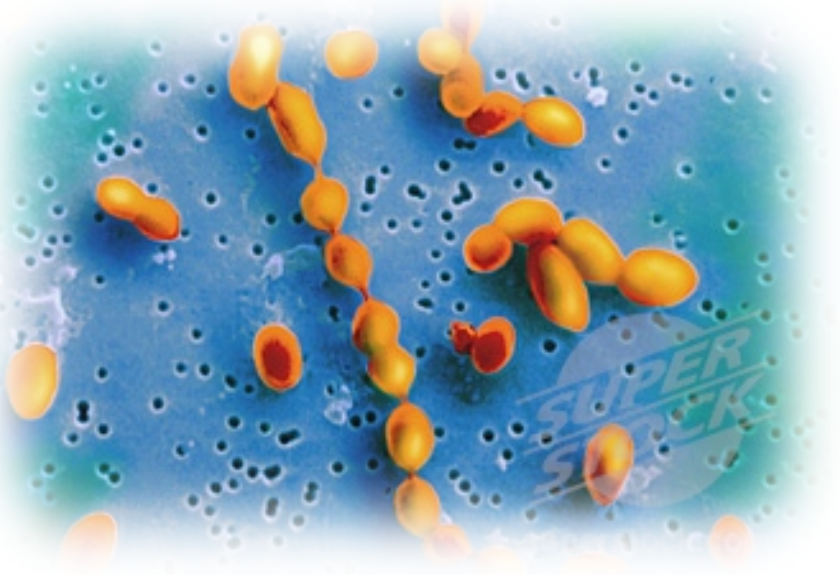
UNIT 3: INTRODUCING BIOLOGY

Chapter 8: From DNA to Proteins

I. Identifying DNA as the Genetic Material (8.1)

A. Griffith finds a "**transforming principle**"

1. Griffith experimented with the **bacteria** that cause pneumonia.



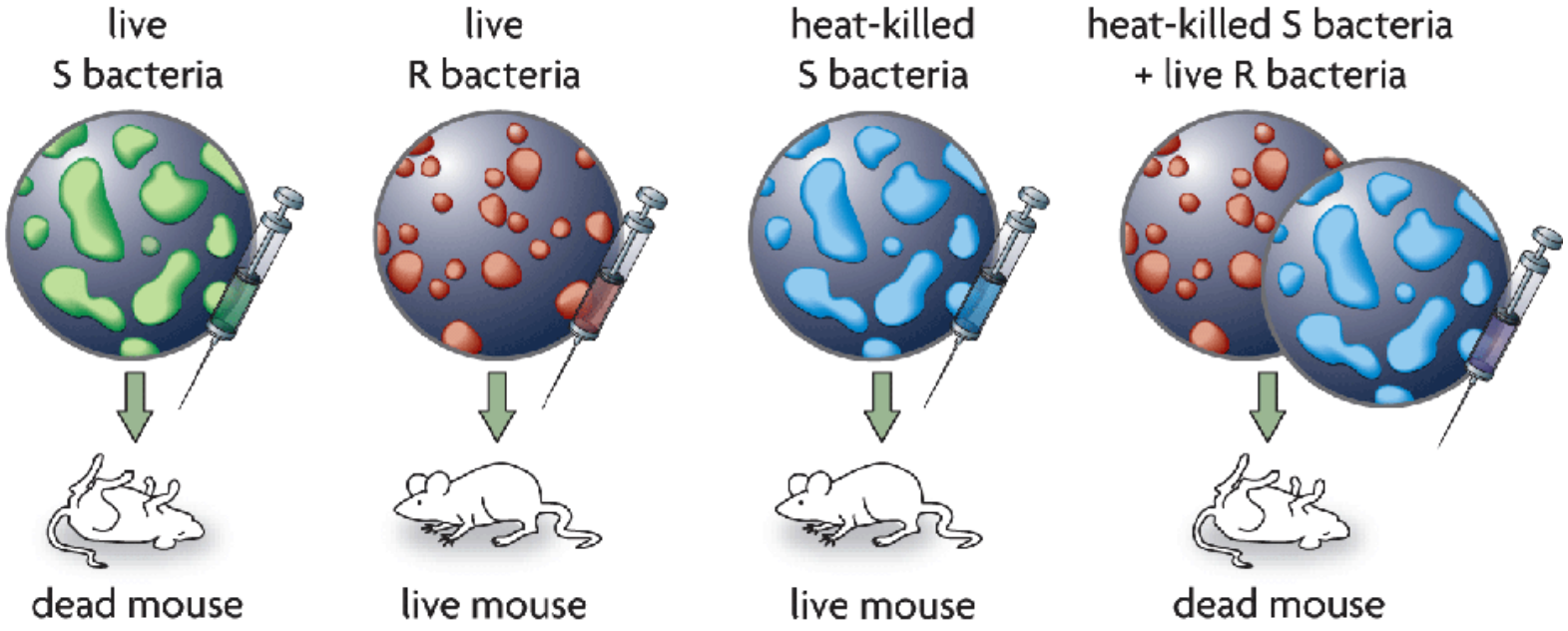
Pneumococcus ***bacteria***

2. He used **two forms** and injected them into mice

   a. The S, or smooth form (**deadly**)

   b. R form, or rough (**not deadly**).

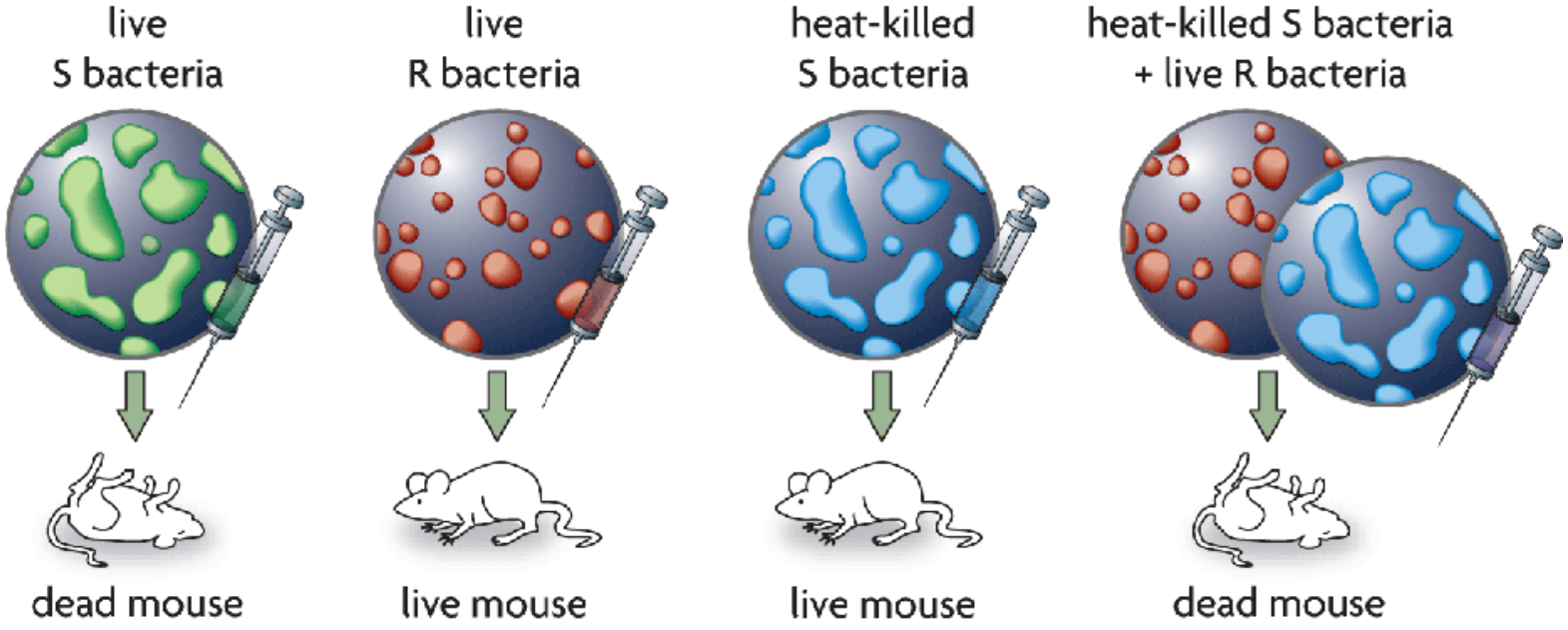
3. S form of bacteria **killed with heat** mice **unaffected**



4. Injected mice with **combination of heat-killed and live R bacteria**

a. **Mice died**

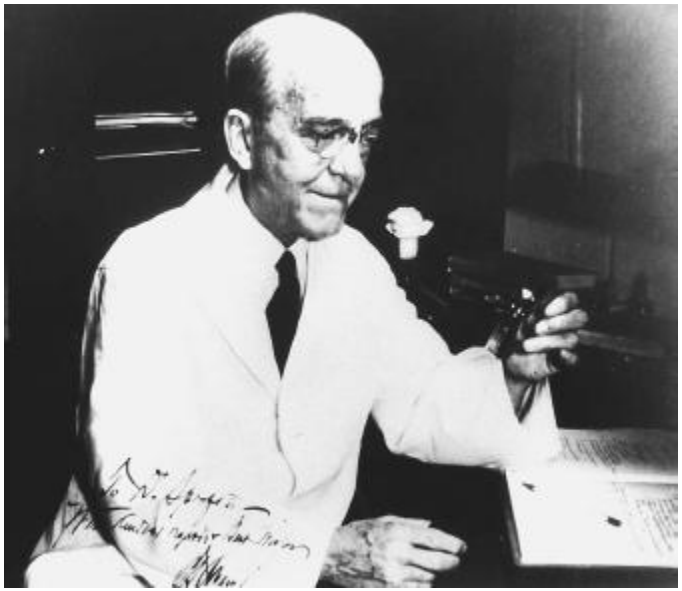
b. Griffith concluded that a **transforming material** passed from dead S bacteria to live R bacteria, making them deadly.



B. Avery identifies **DNA** as the **transforming principle**

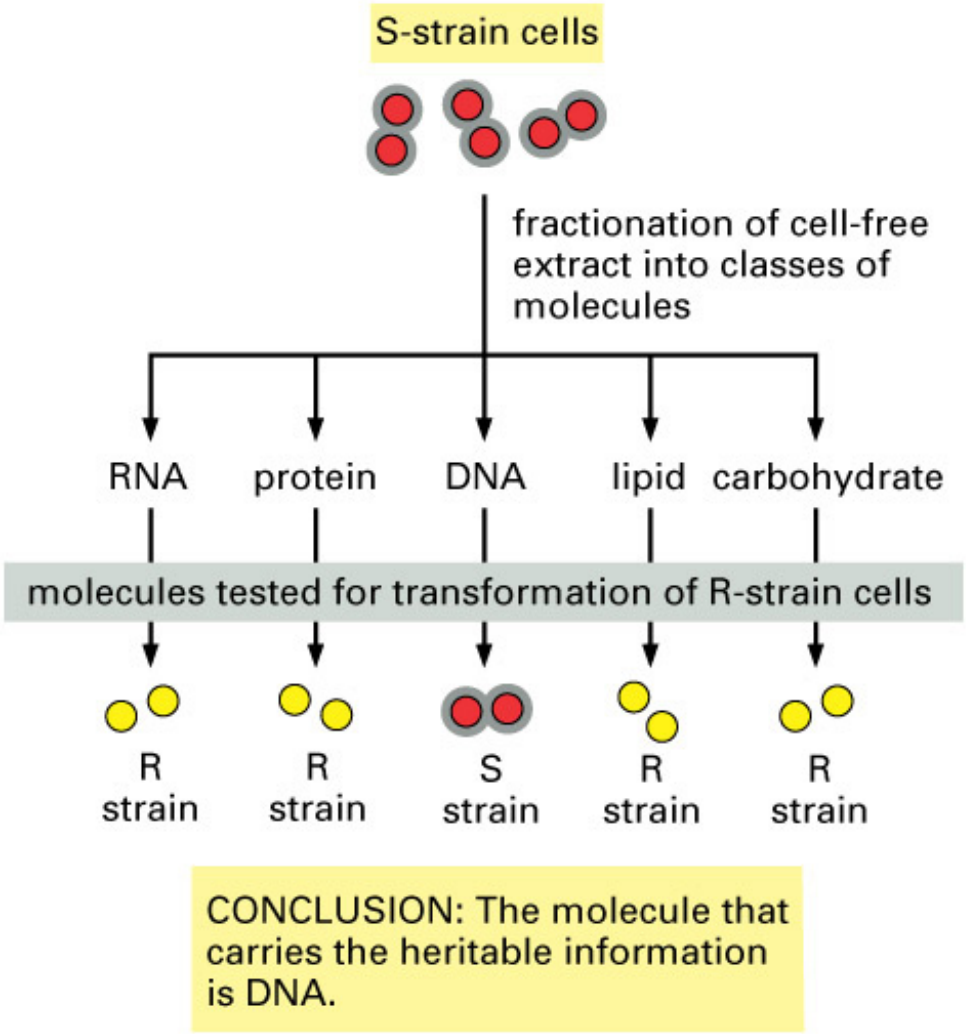
1. Experimented with R bacteria and **extract** made from S bacteria

2. Allowed them to observe transformation of R bacteria



3. Developed process to **purify their extract**

a. Performed series of tests to find out if transforming principle was **DNA** or **protein**



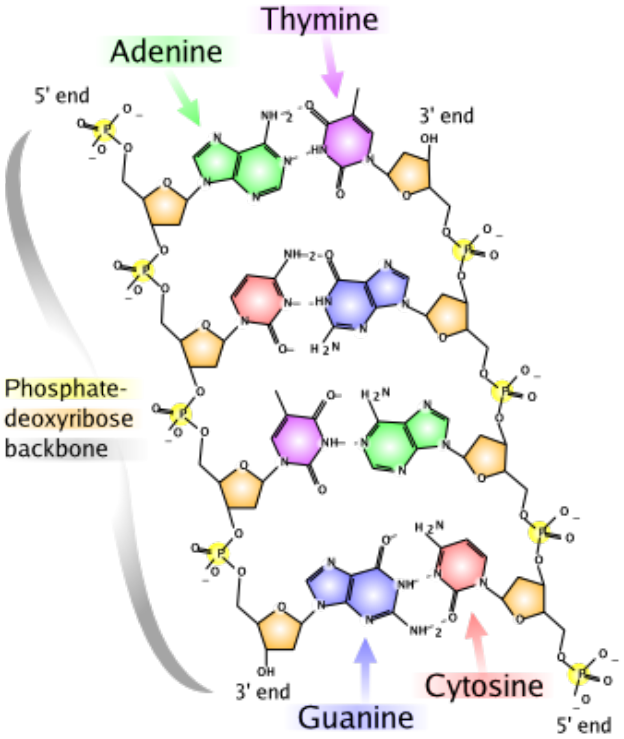
b. Performed **chemical tests** that showed no proteins were present.

c. Test revealed that **DNA was present**

4. Performed tests with **Enzymes**

a. Added enzymes to break down **proteins- transformation still occurred**.

b. Added enzymes to break down **RNA- transformation still occurred**.



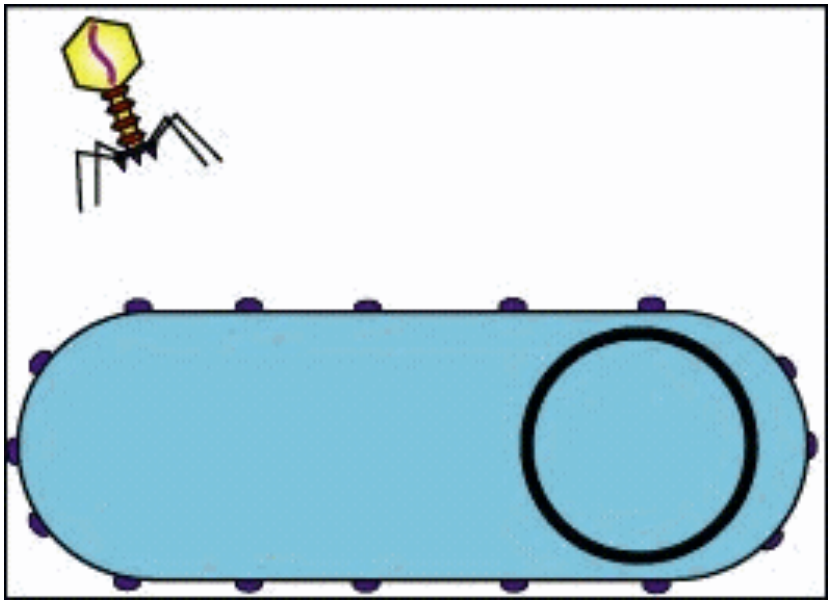
c. Added enzymes to break down **DNA- transformation failed to occur**.

d. **Concluded DNA was transforming factor**

C. Hershey and Chase confirm that DNA is the genetic material

1. Alfred Hershey and Martha Chase provided conclusive evidence that **DNA was the genetic material** in 1952

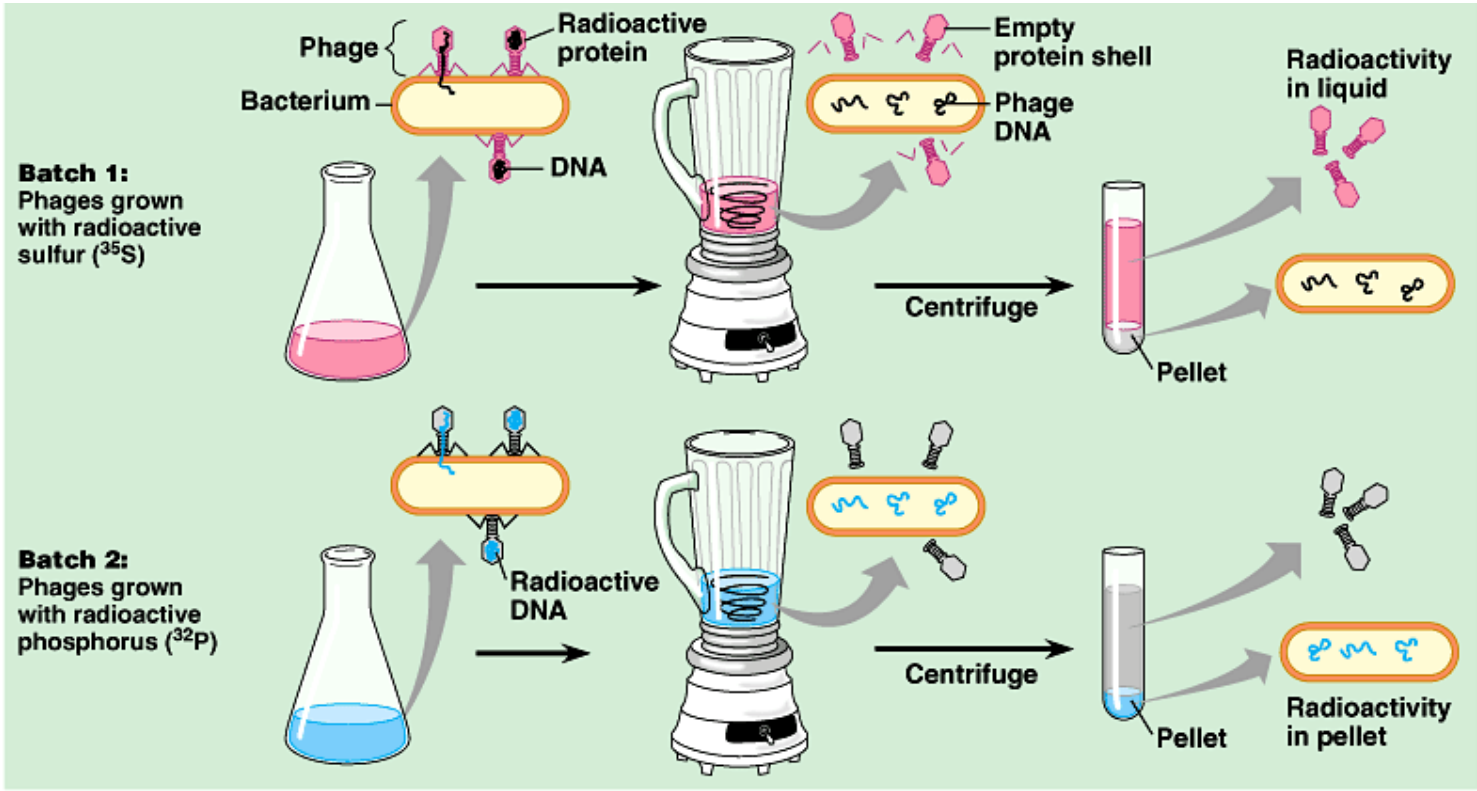
2. Studied **viruses** that infect bacteria (**bacteriophage**)



a. Bacteriophage is simple- **protein coat** surrounding **DNA core**

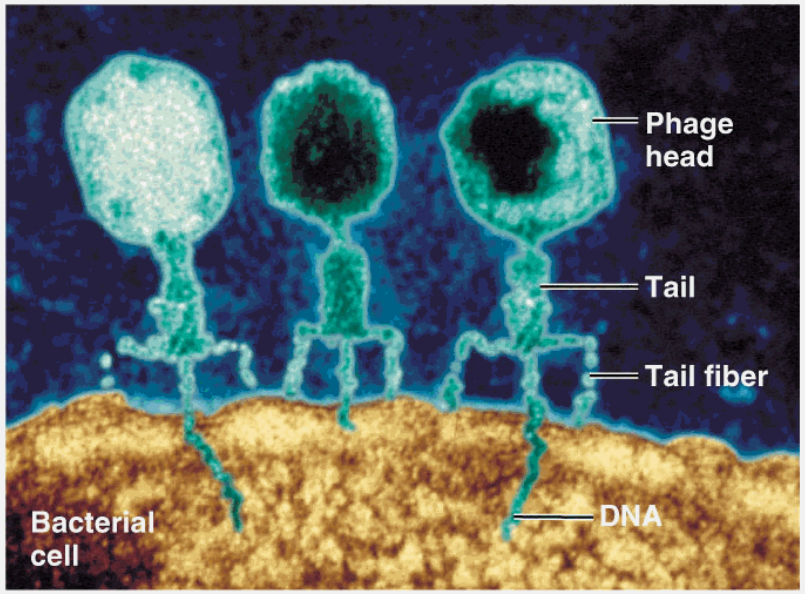
1). **Proteins** contain **sulfur** buy **very little phosphorus**

2). **DNA** contains **phosphorus** and **very little sulfur**



b. **Experiment No.1**- Bacteria infected with phages with **radioactive sulfur** atoms- **no radioactivity inside bacteria**

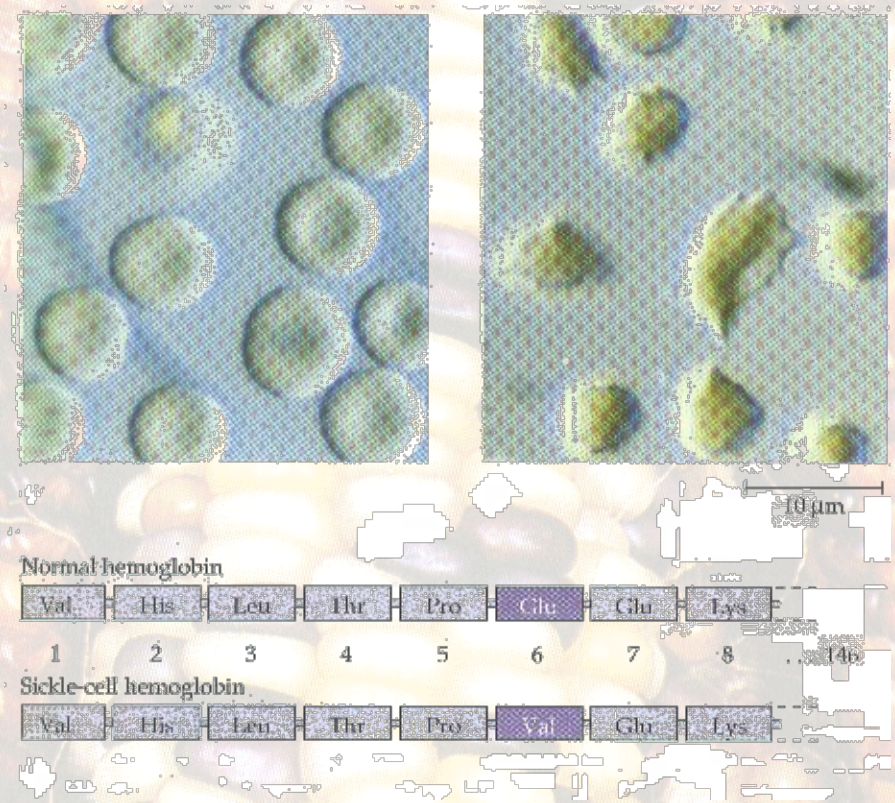
c. **Experiment No.2-** Bacteria infected with phages with **radioactive phosphorus** atoms- **radioactivity found inside bacteria**



(a) T2 and related phages use their tail pieces to attach to the host cell and inject their genetic material (TEM).

d. Concluded phages **DNA** had entered bacteria but proteins had not. **Genetic material must be DNA**

Sickle cell anemia is caused by what type of genetic mutation?



Point mutation

Review Quiz