Hershey and Chase Experiment

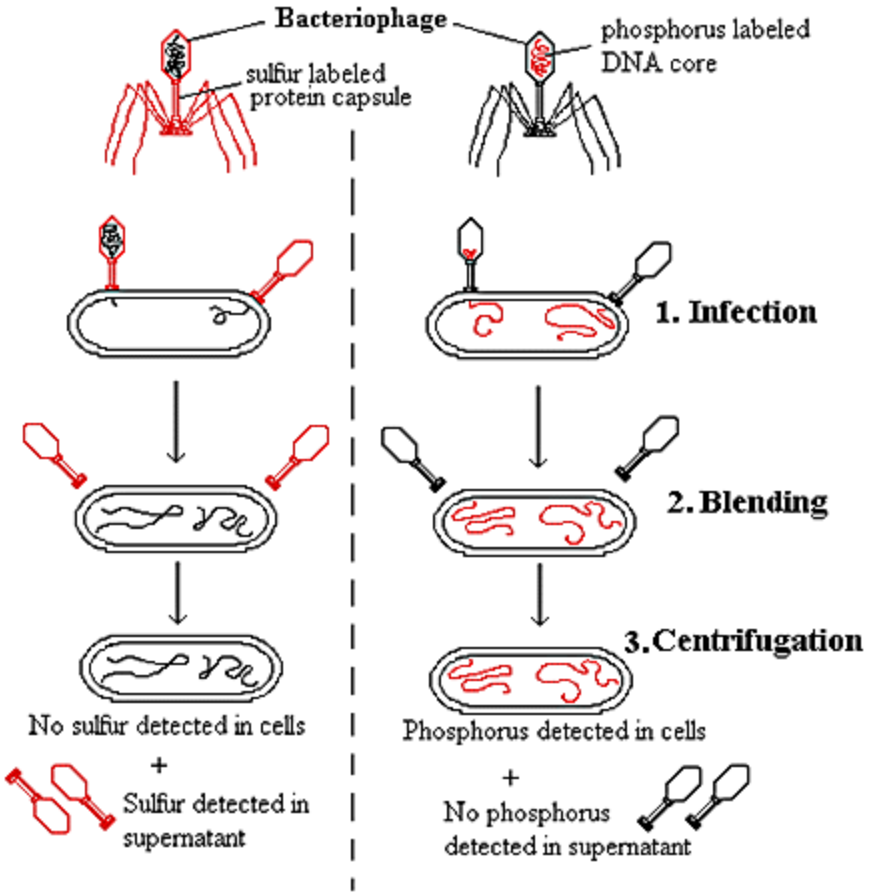
Even after the compelling evidence provided by the Avery, Macleod and McCarty experiment, there were still a few skeptics out there who weren't convinced. The debate still raged between proteins and DNA. However, the Hershey and Chase experiment permanently put an end to this long-standing debate.

Alfred Hershey and Martha Chase in 1952, performed an experiment that proved, without a doubt, that DNA was the carrier of information. For their experiment, they used the bacteriophage T2. A bacteriophage is a virus that only infects bacteria. This particular virus infects ***Escherichia coli*.** T2 had a simple structure that consisted of just 2 components – an outer protein casing and the inner DNA. Hershey and Chase took 2 different samples of T2. They grew one sample with ^{32}P, which is the radioactive isotope of phosphorus, and the other sample was grown with ^{35}S, the radioactive isotope of sulfur for many generations.

The protein coat has sulfur and no phosphorus, while the DNA material has phosphorus but no sulfur. Thus, the 2 samples were labelled with 2 different radioactive isotopes.

The viruses were then allowed to infect the *E. coli*. Once the infection was done, the experimental solution was subjected to blending which removed the protein

ghosts or empty shells of the virus from the body of the bacteria. Centrifugation separated the bacteria from everything else (formed pellet at the bottom of the tube). The bacterial solution and the supernatant were then checked for their radioactivity.



The Hershey-Chase Experiment

In the first sample, where ^{32}P was used, the bacterial solution showed radioactivity, whereas the supernatant barely had any radioactivity. In the sample

where ^{35}S was used, the bacterial solution didn't show any radioactivity, but the supernatant did.

This experiment clearly showed that DNA was transferred from the phage to the bacteria, thus establishing its place as the fundamental carrier of genetic information.

Hershey shared the Nobel prize of medicine along with Luria and Delbruck in 1969.