**Hershey & Chase Experiment**

The Hershey-Chase experiment was conducted in 1952 by Alfred Hershey and Martha Chase that identified DNA to be the genetic material of phages. A phage is a virus that infects bacteria. It consists of a protein coat that encloses dsDNA. Since phages consists only of nucleic acid surrounded by protein, they tend themselves nicely to the determination of whether the protein or the nucleic acid is the genetic material.

Hershey and Chase designed an experiment using radioactive isotopes of sulfur and phosphorus to keep separate track of the viral proteins and nucleic acid during the infection process. They used the T2 bacteriophage and the bacterium E.coli. The phages were labeled by having them infect bacteria growing in culture medium containing the radioactive isotopes 35S or 32P. Hershey and chase then proceeded to identify the material injected into the cell by phages attached to the bacterial wall. When 32-labeled phages were mixed with unlabeled E.coli cells, Hershey and chase found that the 32P label entered the bacterial cells and that the next generation of phages that burst from the infected cells carried a significant amount of the 32P label. When 35S labelled phages were mixed with unlabeled E.coli, the researchers found that the 35S label stayed outside the bacteria for the most part. Harshey and Chase thus demonstrated that the outer protein coat of a phage does not enter the bacterium it infects, whereas the phage’s inner material, consisting of DNA, does enter the bacterial cell. Since the dNA is responsible for the production of the new phages during the infection process, the DNA , not the protein, must be the genetic material. Harshey shared the 1969 Nobel Prize in Physiology or Medicine for his discoveries concerning the genetic structure of viruses.

