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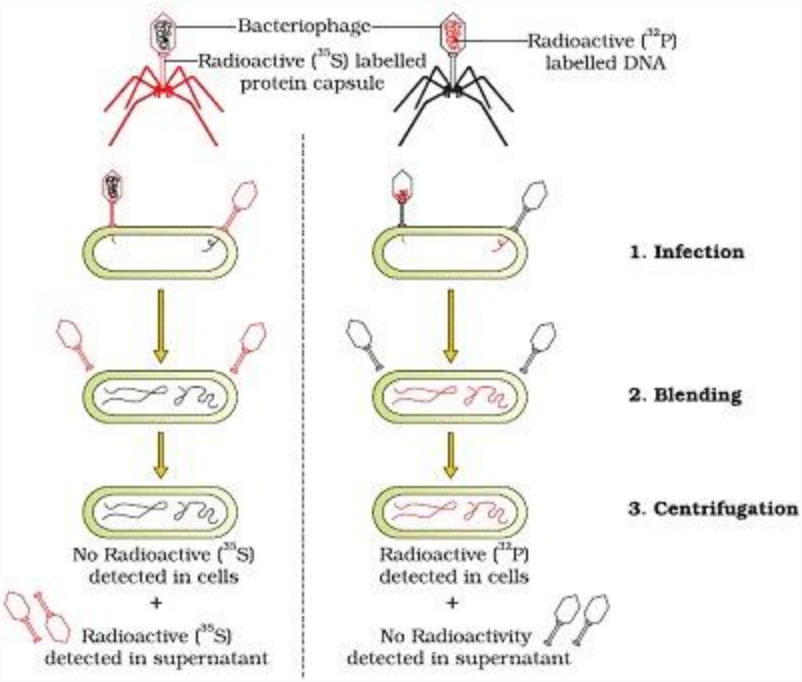
Experimental proof that DNA is the genetic material :

Alfred Hershey and Martha Chases (1952) worked with virus that infect bacteria called bacteriophages.

- In one preparation, the protein part was made radioactive and in the other, nucleic acid (DNA) was made radioactive. These two phage preparations were allowed to infect the culture of E.coli. Soon after infection, before lysis of cells, the E.coli cells were gently agitated in a blender, to loosen the adhering phage particles and the culture was centrifuged.
- The heavier infected bacterial cells pelleted to the bottom and the lighter viral particles were present in the supernatant. It was found that when bacteriophage containing radioactive DNA was used to infect E.coli, the pellet contained radioactivity.
- If bacteriophage containing radioactive protein coat was used to infect E.coli, the supernatant contained most of the radioactivity.

His experiment shows that protine does not enter the bacterial cell and only DNA is the genetic material.



Properties of Genetic Material:
a) It should be able to generate its replica (replication)
b) It should chemically and structurally be stable.
c) It should provide the scope for slow changes (mutation) that are required for evolution.
d) It should be able to express itself in the form of ‘Mendelian Characters’.

• DNA is chemically less reactive but structurally more stable as compare to RNA. So, DNA is better genetic material.

• RNA used as genetic material as well as catalyst and more reactive so less stable. Therefore, DNA has evolved from RNA.