International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

The RNA Virus Genome Mutation

Avi Sinha

A high School Biology student

Abstract

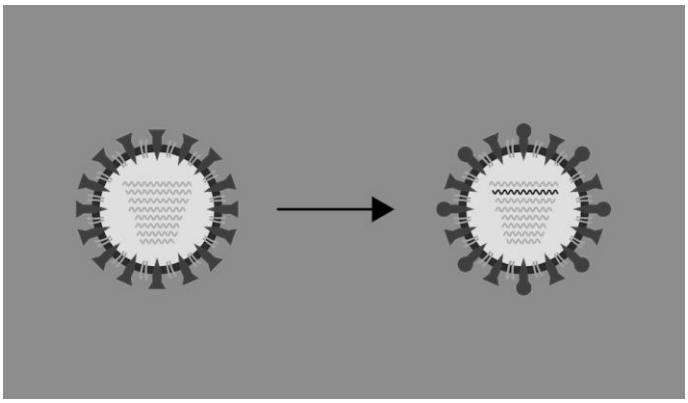
The viruses are biggest riddle for medical science how they behave, how they infect and how they function and why are they so harmful these points are covered. The viruses are the microorganisms which are smaller than bacteria and more contagious than bacteria. How a RNA gene mutated and virus mutates like many variant of SARS-CoV-2 latest.

INTRODUCTION

Any cell replicates by the process called central dogma in which when DNA is converted into DNA it is called REPLICATION whereas when DNA is converted into RNA it is called TRANSCRIPTION and then RNA to polypeptide it is TRANSLATION. In 1970 Howard Martin Temin found that in RNA virus or Retrovirus central dogma takes place. But how mutation occurs.

MUTATIONS

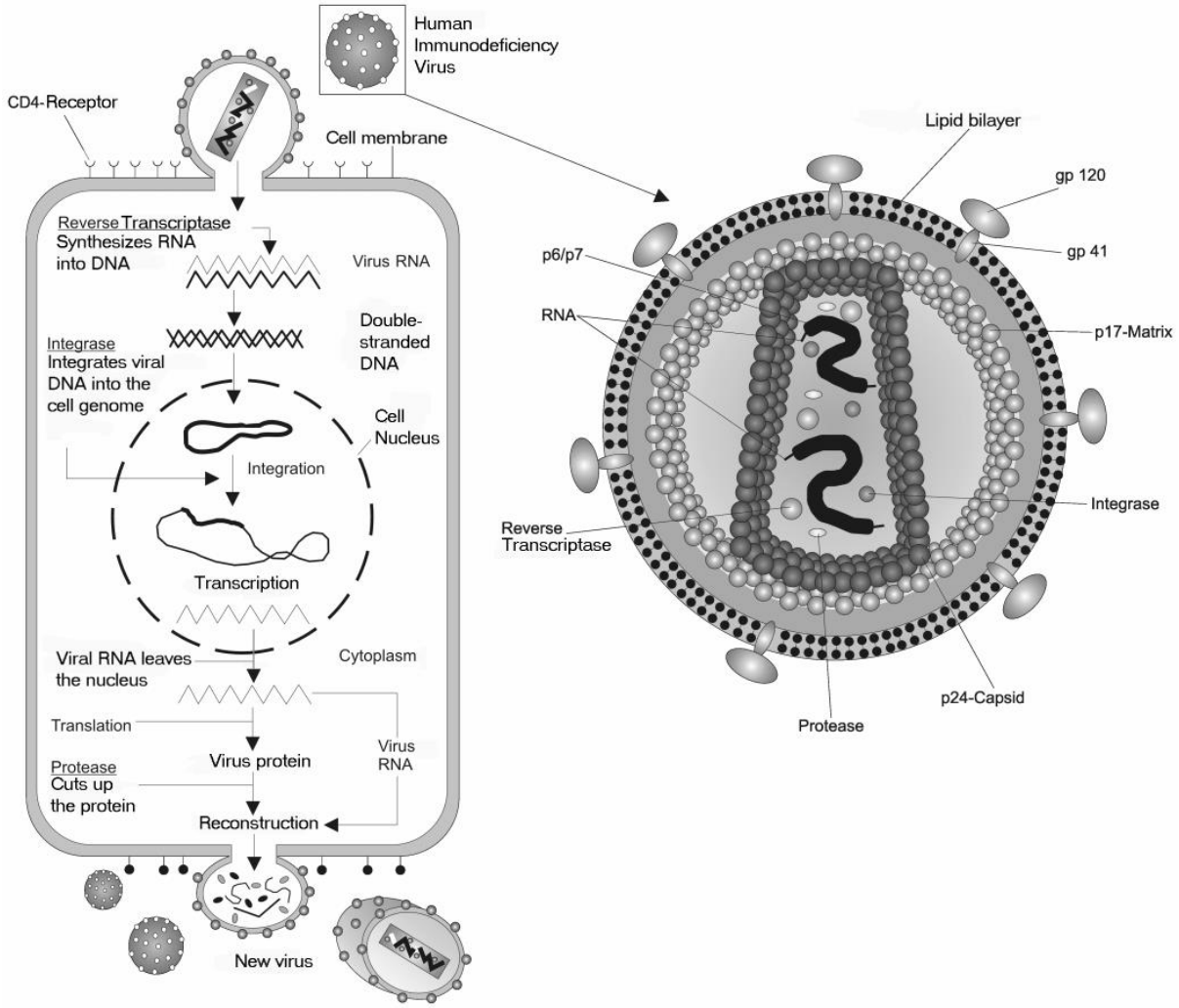
The mutation is change in DNA sequencing or genetic information of a cell from one generation to another it usually occurs in DNA when the genome sequencing changes same as in RNA the sequencing of RNA is changed creating mutations and variation by changing forms. The main factor is RNA POLYMERASE which is used for formation of RNA form DNA during transcription.



GENETIC MUTATION IN VIRUS

*The RNA virus shows much faster mutation than any of genetic materials because of instability as sequencing changes easily hence creating mutations.

The another reason is RNA POLYMERASE this lacks proofreading property hence the errors are easy in RNA. This is major reason for Retrovirus to mutate easily.

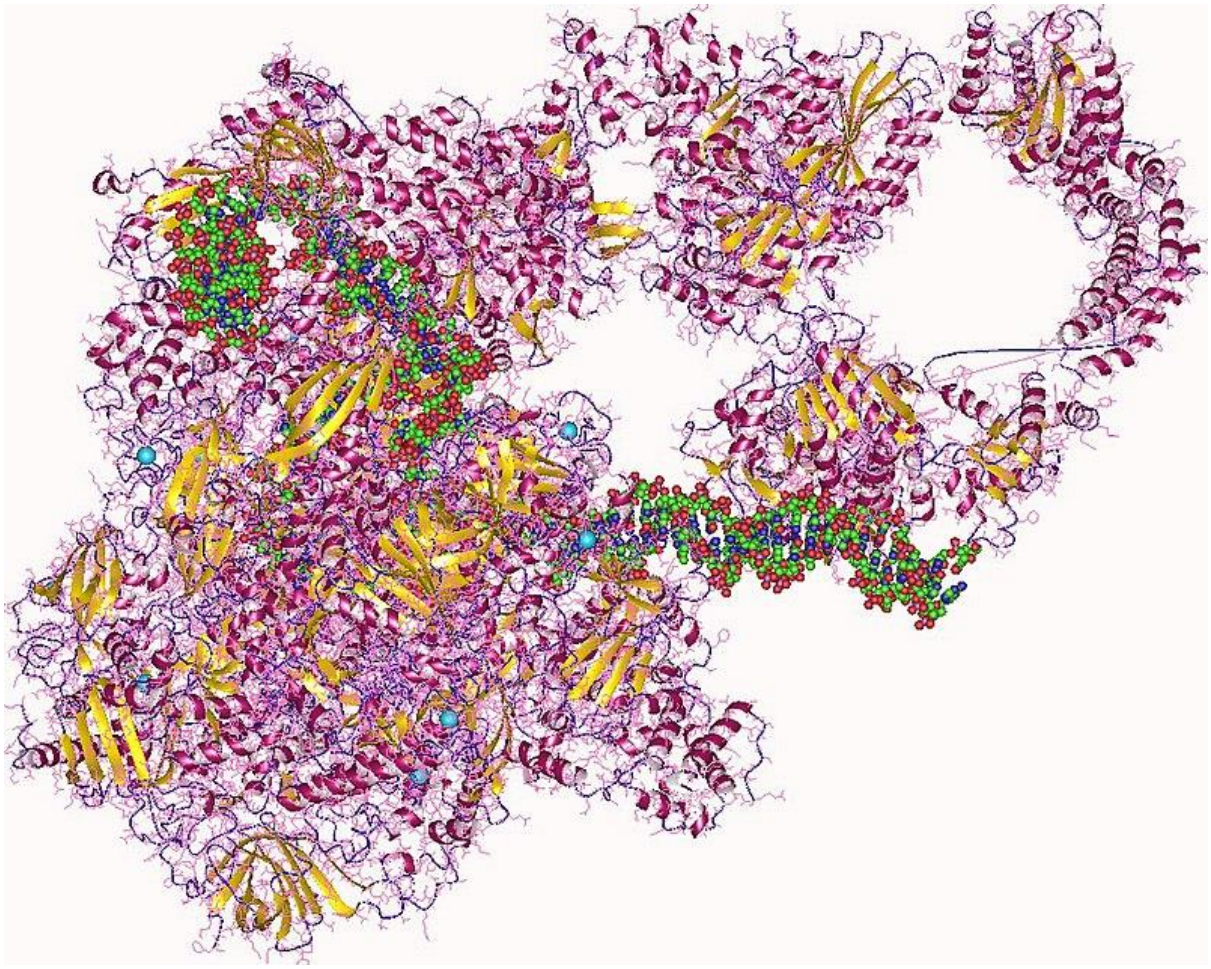


THE EXAMPLE OF HIV (A RETROVIRUS)

During central dogma these types of mutation occurs possibly.

RNA MUTATIONS THEORY/HYPOTHESIS

According this theory the major reason for the mutation is the "stability" as RNA is unstable and during the viral infections when virus infects the host cell and if it starts replicating and if it is retrovirus it shows the process of central dogma and during this process there are many enzymes and chemicals which works on this hence when RNA is ejected in the cytoplasm of host by virus the machinery under host cell starts working on the genetic material hence during these processes there is a high chance of errors in gene and this can cause the major changes in variants. When RNA enters the cytoplasm the REVERSE TRANSCRIPTASE starts functioning on it and the RNA starts getting changed into DNA here DNA is double stranded the **RNA polymerase acts on DNA hence the errors usually occurs in this process causing mutations.**



THE STRUCTURE OF RNA POLYMERASE

This COMPLICATED structure can possibly leads to error in RNA polymerization creating mutations in viral cell and can produce weak or strong mutations.

Each replication causes some amount of mutation and after every few generations of replication the new major mutation occurs.

HENCE, the more replication the more mutation