

Different Types of Molecular Viral Infections

Lucia Magnelli

Florence University, Italy

Molecular virology has developed very prominent tools to dissect viral functions by engineering infectious molecular clones with preselected modifications. Molecular virology is the study of virus on a molecular level. Viruses are submicroscopic parasites that replicate inside host cells. Viruses rely on their host to replicate and multiply. This is because viruses which are unable to go through cell division, as they are acellular—meaning they lack the genetic information which encodes the necessary tools for protein synthesis or generation of metabolic energy. Pathogenicity is the ability of one organism to cause disease in another. There is a specialized field of study in virology called viral pathogenesis in which it studies how viruses infect their hosts at the molecular and cellular level. There are five different types of viral infections: Abortive infection: This kind of infection occurs when a virus successfully invades a host cell. It is unable to complete its full replication cycle and produce more infectious viruses.

Acute infection: Acute infections are brief since they are often completely eliminated by immune system. Acute infection is associated with epidemics since most of virus replication happens before the onset of symptoms.

Chronic infection: These infections have a prolonged course and which are hard to eliminate since the virus stays in the host for a significant period.

Persistent infection: There is a delicate balance between the host and the virus in this pattern. The virus adjusts its replication and pathogenicity levels to keep the host alive for its own benefit. While it is possible for the virus to live and replicate inside the host for its entire lifetime and oftentimes the host eventually eliminates the virus.

Latent infection: The latent virus infections tend to exist inside the host for its entire lifetime. An example of such infection is the herpes simplex virus in humans. This virus is able to stop its replication and restrict its gene expression in order to stop the recognition of the infected cell by the host's immune system. Advances in molecular virology have led to an understanding of the microanatomy of most viruses and have provided reagents which have made it possible to define the antigens which play a major role in immunity. An alternative way to treat viral infections would be antiviral drugs in which the drug blocks the virus's replication cycle. The specificity of an antiviral drug is the key to its success. These drugs are toxic to both the virus and the host but in order to minimize their damage they are developed in such a way as to be more toxic to the virus than to the host.