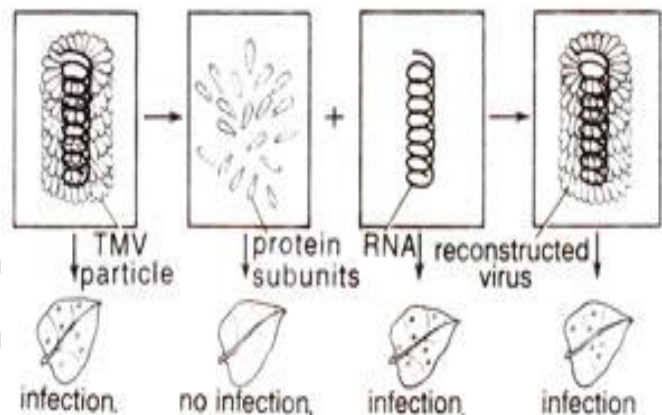


Experiments conducted by H. Fraenkel-Conrat (Genetic Material as RNA)

The first evidence that RNA also has the capacity to carry genetic information came from experiments conducted with **tobacco mosaic virus (TMV)**. This virus does not contain any DNA, and is composed of RNA (6%) surrounded by a hollow cylinder of protein subunits. The experiments conducted by **H. Fraenkel-Conrat** in California showing that RNA is the genetic material in this virus.

Techniques were first developed for separating TMV particles into RNA and proteins. Later by using RNA and proteins separately in tests for infectivity, it could be shown that RNA alone was able to cause infection. Such a property was not found in the protein fraction.

In one experiment, two viruses used were **tobacco mosaic virus (TMV)** and **Holmes rib-grass virus (HRV)**. The latter was isolated from *Plantago lanceolata* and therefore, is also known as *Plantago* strain.



The RNA of TMV and Protein of HRV produces molting of leaves and ring pattern of leaves respectively.

The chimeras using RNA of one strain and protein of the other strain could be obtained. It was found that when these chimeras were used for infection, the progeny had proteins which corresponded to the virus from which RNA of the infecting virus particles was derived. This proved that specificity of virus proteins was determined by RNA alone and that proteins carried no information.