Chapter 8
Web Text Box 3

Hijacking the ribosome: how Hepatitis C takes control

The Hepatitis C virus shuts down the liver protein synthesis machinery and forces the resources of the infected cell to be diverted into production of viral proteins that will be used to make new virus. It does this by commandeering the cell's ribosomes to its own mRNAs. Hepatitis C mRNAs do not have a 7-methyl guanosine cap at their 5' ends. Instead they have internal ribosome entry sites (IRES), which are specific sequences to which the ribosomes bind tightly. The clamping of the ribosome to the IRES forces initiation of viral protein synthesis at the expense of host cell protein synthesis.

Hepatitis C is a particularly nasty virus because infected people can go on to develop liver cancer, cirrhosis and other chronic liver disease. In the United States alone, 10,000 people die per year from Hepatitis C infection. It is hoped that drugs can be developed that will prevent the host ribosome from binding to the viral IRES and so halt the production of new virus in an infected liver.