Abstract

Molecular chaperones are proteins which enable other proteins to assemble into native conformation and are essential for viability of the cells. Chaperones of the Hsp70 family bind to newly synthetized and denaturated proteins, prevent their aggregation and facilitate their assembly. They participate in assembly and disassembly of oligomers and also in the transport across the membranes. Chaperones of the Hsp90 family do not participate in the assembly of nascent or denaturated proteins. They bind proteins which are nearly in native conformation and enable them to assemble into conformation suitable for ligand binding or interacting with other proteins.

These attributes predestinate chaperones to participate in the replication cycle of DNA viruses. A huge amount of proteins is translated during viral infection. These proteins require the chaperones to facilitate their assembly and are also required for assembly into oligomers and macromolecular structures. In addition to capsid assembly the chaperones also participate in transport of genetic information to the sites of replication, disassembly of incoming viral particles or replication of viral DNA. Therefore, the development of specific chaperone inhibitors is a promising approach. They could be used against broad spectrum of viral infections without the risk of resistance development. Application against infections caused by new, yet undescribed viruses, might be another important use of such inhibitors.