

c4.2

BACTERIOPHAGE AS A MODEL FOR THE STUDY OF SELF-ASSEMBLY

Poglazov B.

A.N.Bach Institute of Biochemistry, 117071 Moscow, Russia
FAX: (095) 954-2732; E.mail: inbio@glas.apc.org

Self-assembly is a spontaneous, arranged aggregation of biopolymers leading to formation of biological important supermolecular structures. Undoubtedly the self-assembly played an important role in the process of origin of a primary cell capable to a repeated formation of whole set of intracellular systems during the reproduction. Bacteriophage T4 is very convenient model for a study of the self-assembly principles of elementary biological systems because its particle included variously shaped supermolecular protein aggregates: hollow cylinders, spherical envelope, hexagonal plate and long fibres.

We divided the bacteriophage T4 particle into components (envelope of head, tail sheath, tail core, base plate, tail fibers), then obtained their pure fractions and each fraction was studied for its ability to self-assembly. In these experiments we established that besides spontaneous arranged aggregation the involvement of directive and limiting factors is essential.

Basing on the electron microscopic studies of contacting surface of interacting protein aggregates we have made conclusion about the important role of additive van der Waals forces in self-assembly.