ULTRASONIC VELOCIMETRY AS A METHOD OF INVESTIGATION OF THE BACTERIOPHAGE NUCLEOPROTEIN COMPLEXES

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Ultrasonic velocity in biological media is an important physical characteristics containing an information on molecular interactions in the object under investigation. Development of methods of precise measurements of ultrasonic velocity in small volumes of luquids has opened a new field of application of ultrasound in biological investigations. The present study is an attempt to investigate structural transitions and molecular interactions in bacteriophage T4B by means of ultrasonic velocimetry. Measurements of ultrasound velocity in the phage suspensions were performed using previously described device with the relative accuracy of 10^{-6} and the volume of cell of about 0.1 cc. Temperature dependences of ultrasound velocity in the suspensions of a) native phage, b) reorganized phage and c) osmotically shocked phage were investigated.

A new structural transition in the bacteriophage in the temperature region of 35-40°C was found. This transition may be related to the reversible transformation of the bacteriophage baseplate.

It was shown that the hydration of DNA packed within the phage structure is the same as of free molecule of DNA in aqueous solution. This result is important for understanding the structure of nucleoprotein complexes of bacteriophages.