

NANOPHYSICS AND ANTIVIRAL THERAPY

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S u m m a r y

A new mechanism of interaction between viruses and nanoparticles is proposed. The mechanism is based on the local-field enhancement effect inherent only in nano-objects and can manifest itself in nanoparticle–virus systems. The basic idea consists in vacuum fluctuations that are always present in any physical system. This mechanism is universal and does not depend on the details of nanoparticle and virus structures, which was confirmed by numerous experiments carried out by us and in other scientific groups. A new method of purification of biofluids from nano-objects such as nanoparticles and viruses is also discussed. The method is based on a selective interaction between nano-objects and either a nanostructured surface, along which a surface plasmon-polariton propagates, or a system of nanothreads, on which a local plasmon-polariton is excited. On the basis of the method proposed for weakening the virus activity due to the action of a suspension of nanoparticles, a new effective way for the production of human leukocytic interferon has been developed and verified experimentally.