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Chlamydia trachomatis* growth inhibition in a HEK293 cell line induced by expression of antimicrobial peptides genes from the venom of the spider *Lachesana tarabaevi

V.N. Lazarev*[1], M.M. Shkarupeta[1], N.F. Polina[1], E.S. Kostrjukova[1], S.A. Levitskii[1], S.A. Kozlov[2] et al

[1]*Research Institute for Physico-Chemical Medicine, Russian Federation,* [2]*Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Russian Federation*

Chlamydia trachomatis is currently the most common sexually transmitted bacterial infection in the industrialized countries. Treatment of a chlamydial infection with antibiotics is a serious problem because of the persistence of infectious agents which develop in an organism. A promising trend in therapy of chlamydioses is the use of antimicrobial peptides. However, there are some serious drawbacks to the application of artificially synthesized antimicrobial peptides for therapy of infectious diseases. One example is the high cost of production and the need for high doses. Consequently, we studied the possibility of an expression of the antimicrobial peptide genes directly in an infected cell. Short linear antimicrobial and cytolytic peptides, named latarcins, from the venom of the spider *Lachesana tarabaevi* (Zodariidae) were cloned in the plasmid vectors under control of a human cytomegalovirus tetracycline-responsive promoter. We demonstrated an inhibition of *Chlamydia trachomatis* infections after the transfection into the HEK 293 cell line of these plasmid constructs. The level of infection inhibition was within the range of 20 to 85% for different peptides. The highest antichlamydial activity was demonstrated by LaTx-05 peptide: (GFFGNTWKKIKGKADKIMLKKAVKIMVKKEGISKEEAQAKVDAMSKKQIRLYLLKYYGKKAL QKASEKL).

Using different schemes of gene expression induction (1 and 16 h post infection) we also showed that *Chlamydia trachomatis* growth inhibition occurs at an early stage of infection.

This data allows us to suggest that recombinant plasmid vectors expressing genes of antimicrobial peptides latarcins can be considered as potential agents for prophylaxis and for the treatment of infectious diseases caused by intracellular parasites.

Keywords: antimicrobial peptides, Chlamydia trachomatis