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Development of novel strategies for suppression of non-wished viral and cellular genes, and for design of molecular anti-malignancy and anti-viral vaccines

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The potential of viruses (with DNA- and RNA-genome) as appropriate vectors for development of various therapeutic strategies has been proved about immunization by application of recombinant vaccines and therapeutic procedures in different disorders by substitution of appropriate cell nucleotide sequences. Additionally, the properties of the virus Spike (S) protein to bind to the cellular receptor for the Angiotensin- Converting Enzyme 2 (ACE2), leading to suppression of the normal function of the last and thus, to activated formation of thrombs, affecting the functions of many tissues and organs in the organism, should also be taken in consideration, including about the DNA- and RNA-sequences, containing information for the synthesis of this viral protein. So, the main goal is directed to development of first steps for application of virus vectors for design of molecular (DNA, RNA and protein) anti-malignant and anti-viral vaccines against other virus protein, different of virus protein S, as virus envelope (E) protein or against virus membrane

(M) protein, but also of specific siRNAs against oncogenes, and against the virus genes, coding virus protein S. The monolayers of inoculated with low initial infectious titers (high initial dilutions of viral suspensions) of vaccine avipoxviral strains (Poxviridae family) mammalian cells were freezed in the presence of cryo protector Dimethylsulfoxide (DMSO), thawed and re-incubated

As a source of the extra-cellular virus served the centrifuged and filtrated cultural fluids, and of their intra-cellular - scraped-off cellular monolayers. De novo-seeded cultures of mammalian cells were then inoculated with the intra- and extra-cellular forms of the vaccine viral strains. The significantly higher titers of the intra- cellular forms of both strains than these of their extra-cellular forms (Fig. 1A, B) could be explained with the existence of the intra-cellular form also as pro-virus. Thus, a possibility for transfer of nucleotide (DNA- and/or RNA-) fragments from virus to cellular genome, as well as in the opposite direction (from cellular to viral genome), influence of organic detergents as DMSO plus availability of drastic temperature changes, was suggested, which was in confirmation with the literature findings.

Biography

Iskra V Sainova has completed her PhD at the age of 28 years at the Department of Oncovirology to the Institute of Experimental Pathology and Parasitology (IEPP) to Bulgarian Academy of Sciences (BAS) in Sofia, Bulgaria. The main goal has been directed to development of maximally safe methods for application of viral strains for production of gene-engineering anti-malignant and anti-viral vaccines, but also as vectors for transfer of nucleotide sequences. She is assistant professor in the field of molecular biotechnology, molecular and cellular biology. She has over 100 publications that have been cited over 200 times.