Development of new strategies against *SARS-CoV-2*/*COVID-19*

Iskra V Sainova, Research assistant-PhD

Bulgarian Academy of Sciences (BAS), Sofia, Bulgaria

The main goal is connected with suppression of the cellular penetration and/or replication of *SARS-CoV-2*/*COVID-19*, as well as with generation of adequate anti-virus immune reaction, both *in vitro* and *in vivo*. For this goal, molecular vaccines against other virus protein(s), as for instance, against gene, coding virus membrane (M) protein or against virus gene, coding viral envelope (E) protein, but also specific siRNAs against the virus gene, coding viral Spike (S) protein, should be developed and tested. Both siRNAs and molecular vaccines should be constructed and applied by ways, by which maximal safety for the cell and the organism to be achieved. So, *in vitro*-incubated cells should be inoculated with viral strain with RNA-genome (if is possible, belonging to *Coronaviridae* family), which should then be treated with appropriate siRNAs against the virus gene, coding viral S protein, necessary about viral penetration in the cell. Molecular vaccines against other virus protein(s) should also be designed. Subsequent evaluation on the *in vivo*-influence of the tested siRNAs against virus S protein and molecular vaccines against other viral protein(s) on appropriate experimental animals, both non-infected and previously infected with the same RNA-viral strain, should be performed. After performance of all steps, evaluation on the *in vivo*-influence of the tested siRNAs against virus S protein and molecular vaccines against other viral protein(s) on appropriate immunodeficiency rodents as NOD or SCID mice, among which should also be available sub-groups, previously infected with the same RNA-virus strain.

Recent Publications

1. Chen Y, Liu Q, Guo D (2020) Emerging *coronaviruses*: genome structure, replication, and pathogenesis. J Med Virol 92(10):2249.

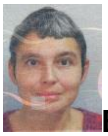
2. Geller C, Varbanov M, Duval RE (2012) Human *coronaviruses*: insights into environmental resistance and its influence on the development of new antiseptic strategies. Viruses 4(11):3044-3068.

3. Manfedonia I, Inkarnato D (2020) Structure and regulation of coronavirus genomes: state-of-the-art and novel insights from *SARS-CoV-2* studies. Biochem Soc Transactions 49:341-352.

4. Naqvi ABT, Fatima K, Mohammad T, Fatima U, Singh IK, Singh A, Atif SM, Hariprasad G, Hasan GM, Hassan I (2020) Insights into *SARS-CoV-2* genome, structure, evolution, pathogenesis and therapies: structural genomics approach. BBA – Molecular Basis of Disease 1866:165878.

5. Perrotta F, Matera MG, Cazzola M, Bianco A (2020) Severe respiratory *SARS-CoV-2* infection: does ACE2 receptor matter? Respiratory Medicine 168:105996.

6. Zhu X, Liu Q, Du L, Lu L, Jiang S (2013) Receptor-binding domain as a target for developing SARS vaccines. J Thorac Dis 5(S2):S142-S148.



Biography

The main goal in the work of Iskra Sainova is directed to balanced activity between oncogenes and tumor-suppressor genes, but also between the protein products of both gene types, on cellular and organism levels. The first step was made during the preparation of her PhD-thesis, and it was

connected with development new methods for application of viral strains for production of gene-engineering vaccines, but also as vectors for transfer of nucleotide sequences. She works in the same field to present. In the current time period, in connection with the situation with *SARS-CoV-2*/*COVID-19*, the same idea is directed to suppression of virus genes in the virus RNA-genome by appropriate siRNAs, as well as with development of appropriate anti-virus molecular vaccines. Iskra Sainova has 1 monography, over 100 research and revies publications, over 100 reviewers of research and review papers and over 170 citations.

E-mail: iskrasainova@gmail.com