

Nanomedicine & Healthcare

November 06-07, 2017 | New Orleans, USA

Nanosilicas as bioactive substances, drug delivery means and activator of pharmacological action of natural or synthetic biologically active substances

L A Suvorova¹ and V V Turov²

¹Macrosorb. LT, Europe

²Chuiko Institute of Surface Chemistry, Ukraine


Toxicoses caused by low-quality food, pharmaceutical treatment or environmental pollution can be successfully treated only due to the usage of different enterosorbents. Nanosilicas (fumed silica) are the most advantageous for binding toxins of protein origin. Moreover, they can deactivate pathogenic flora, act as a carrier of chemical and natural medicinal substances, and improve their biological activity. When used in combination with several types of biopolymers, they may regulate the release rate of active substances. The above-mentioned properties make competitive advantage over products with similar purposes, currently available on the market. Last time, it creates a wide range of composite systems based on nanosilica, which possess strong detoxifying effect, adaptogenic, antioxidant and immune modulating properties, and to develop methods of action prolongation immobilized on the surface of silica-carrier biologically active substances and development of efficient methods improving biological activity of antibiotics due to specific binding of them by silicas or their composites with biopolymeric agents. The most promising is the usage of medicinal products and biologically active additives, produced based on nanosilica, in industrial areas and for people with low income. With the development of nanochemistry, the unique ability of nanooxides to participate in structuration of adjacent water layer was discovered. Because of the interactions between water and nanoparticles, interfacial water decomposes to produce a system nanosized water clusters separated by silica particles. It appears that properties of such nano-structured water are very different from the properties of bulk water. Such water is capable to have different dissolving abilities, for example it does not dissolve polar compounds such as mineral acids and hydrogen peroxide, and also it may form weakly associated water domains with non-polar compounds and

not participate in formation of hydrogen bonds. As a result, upon contact of silica nanoparticles with cellular objects a strong effect on cell metabolism occurs which is probably due to retention of nutrients and stimulation of receptor system near the cell membranes. Then, due to the interaction between nanoparticles of silica-carrier and immobilized on its surface, biologically active substances stimulation of mucous membrane cells will occur, which leads to the growth of biological availability of the products. The main problem in the area of development and introduction of biologically active additives and pharmaceuticals is the conduction of pre-clinical and clinical trials. Conduction of such trials requires significant financial investments, which small and medium-sized enterprises usually can't afford. At present time Macrosorb LT company together with the Chuiko Institute of Surface Chemistry have developed a line of ready to use biologically active additives for detoxification of the body (Silasita), characterized by high antioxidant and immunostimulating activity (Balzasil), for lymph purification (Lymphodren), series of fitosils for preventive care and treatment of number of diseases.

Speaker Biography

Lyudmila Suvorova is a candidate of medical sciences, an expert in the field of nano and biotechnology in the direction of medicine. CEO of Macrosorb LT. The initiator of the creation of the direction is the UNITED GLOBAL HEALTH, the health of the environment, plants, animals, food safety and man in a closed cycle. Leader in the direction of social and inclusive business, GREEN economy for transition countries; participant of 4 projects HORIZON 2020 of the European Union. Suvorova L.A. Is a co-author of 12 scientific articles, co-author of the textbook for universities: "NANOCHEMISTRY in solving the problems of ENDO and exo ecology" and the author of 1 patent. The company MacrosorbLT conducts experimental work and the introduction into practical application of Nanobiocomposite products in the field of nanomedicine and agriculture, water and soil purification.

e: milana@macrosorb.org

 Notes: