- **Nanostructured Carbon Materials for Biomedical Use**

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Abstract

One of the priority trends of carbon nanotechnology is creation of nanocomposite systems. Such carbon nanostructured composites were produced using - raw materials based on the products of agricultural waste, such as grape stones, apricot stones, rice husk. These products have a - wide spectrum of application and can be obtained in large quantities. The Institute of Combustion Problems has carried out the work on synthesis of the nanostructured carbon sorbents for multiple applications including the field of biomedicine. The article presents the data on the synthesis and physico-chemical properties of carbonaceous sorbents using physicochemical methods of investigation: separation and purification of biomolecules; isolation of phytohormone - fusicoccin; adsorbent INGO-1 in the form of an adsorption column for blood detoxification, oral (entero) sorbent - INGO-2; the study of efferent and probiotic properties and sorption activity in regard to the lipopolysaccharide (LPS), new biocomposites - based on carbonized rice husk (CRH) and cellular microorganisms; the use of CRH in wound treatment. A new material for blood detoxication (INGO-1) has been obtained. Adsorption of p-cresyl sulfate and indoxyl sulfate has shown that active carbon adsorbent can remove clinically significant level of p-cresyl sulfate and indoxyl sulfate from human plasma.
Enterosorbent INGO-2 possesses high adsorption activity in relation to Gram-negative bacteria and their endotoxins. INGO-2 slows down the growth of conditionally pathogenic microorganisms, without having a negative effect on bifido and lactobacteria. The use of enterosorbent INGO-2 for sorption therapy may provide a solution to a complex problem - detoxication of the digestive tract and normalization of the intestinal micro ecology.
The immobilized probiotic called "Riso-lact" was registered at the Ministry of Health of the Republic of Kazakhstan as a biologically active food additive. The developed technology is patented and provides production of the medicine in the form of freeze-dried biomass immobilized in vials.
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