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Biological Research in Russia: Neutron Research as Essential Part of a Multidisciplinary Approach

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Improving the parameters of biological macromolecules for usage in biomedicine and biotechnology requests the knowledge of the exact molecular mechanism of action of such biomolecules. Structural biology and dynamic studies of biological macromolecular complexes became essential part of such research. In addition to most abundant studies, where static structure of a protein is solved by the X-ray crystallography, other complementary methods, such cryo-electron microscopy, molecular dynamics simulation and small-angle scattering methods are used to receive additional information. Neutron studies in modern biology covers important field, allowing for observe structural features of extra-large proteins, nucleic acids and ribonucleoprotein complexes in their native state in solution. Despite the obvious deficiency of modern neutron research infrastructure for biological research in Russia, there is high level of expertise accumulated in a number of research centers of Russia. In this report most actual results of application of neutron methods for biomedicine and biotechnology will be summarized.

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