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CHRONICLE

International Symposium "Biological Motility: Achievements and Perspectives" Pushchino, Moscow Region, Russia, May 11–15, 2008

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The International Symposium "Biological Motility" was successfully held at the Institute of Theoretical and Experimental Biophysics and Institute of Cell Biophysics, Russian Academy of Sciences, Pushchino, in 1994. Since then, symposia on biological motility are held biannually. They gather top Russian experts in this field and their colleagues from the Commonwealth of Independent States and non-CIS states. The events of this sort are traditionally supported by the Russian Foundation for Basic Research. The most recent meeting "Biological Motility: Achievements and Perspectives" took place on May 11–15, 2008. It was participated in by over 170 scientists from more than 30 cities. The scientific agenda of the symposium included the following sessions:

1. Structural base of muscle contraction. Experiments and simulations.

2. Sarcomeric proteins and muscle regulation.

3. Development and senescence. Adaptation. Muscle plasticity.

4. Electromechanical coupling. Membranes, pumps, and ion channels.

5. Nonmuscular motility. Cell shape and control of cell functions.

6. Muscle diseases. Nanotechnology in diagnostics and treatment.

Sessions 3 and 5 had the greatest number of reports (approximately one-half of the total number). The stable tendency for increasing number of studies of nonmuscular motility has been observed for long. It is natural, because we begin to perceive the diversity, complexity, and specialization of biological motility at the cellular and molecular levels. Researchers' attention is focused on the dynein–tubulin complex of microtubules, kinesin-dependent organelle transport, dynamics of cytoskeleton rearrangement in amoeboid motility, and signaling pathways. Some reports concerned motility in specialized cells and tissues (e.g., olfactory epithelium), transport systems in plants, and motility related to signal processes, cell differentiation processes, and tissue regeneration.

Another trend is the increasing interest in the adaptation and plasticity of proteins, organs, and tissues, including muscles. It is indicative of the increasing role of basic science in solution of practical tasks in medicine, astronautics, and sport. Change of the functional activity of proteins mediated by controlled expression of protein isoforms with specific features ranks among the most promising directions in future medical science. Studies on the effect of microgravity on the muscular system carried out in Moscow, Pushchino, Kazan, and St.-Petersburg are of special interest. They develop approaches to alleviation of the "muscular hypogravitational syndrome". Mammalian hibernation has long been studied in Pushchino as a natural model of profound metabolism suppression. Recent studies on isoform substitutions in muscle proteins and remodeling of cell homeostasis under hypothermal conditions were presented. The latter item is closely related to studies of membrane processes (Session 4). Investigation of ion channels, mitochondrial transport, and electromechanical coupling is traditionally conducted by research teams in Kazan, Moscow, Pushchino, and St.-Petersburg. Session 6 included many reports on heart malfunction (Moscow, Pushchino, Yekaterinburg, Kazan, and Kiev). Amyloidosis study is gaining speed, as proven by reports on amyloid structure from Gatchina, Pushchino, and Kiev.

Classical directions in muscle science were also touched. Original studies were performed on muscle simulation, tension production, and muscle proteins. Much attention was given to new promising approaches and methods of motility investigation.

The increasing number of young students of biological motility attending the symposia is most gratifying. They obtain experience of great value by listening to reports and meeting their colleagues. The continuity of generations offers hope for future progress in biological motility research in Russia.

The current issue of Biophysics presents some reports delivered at the latest Symposium.

This International Symposium on biological motility, like the preceding ones, was supported by the Russian Foundation for Basic Research (project 08-04-06030) and the Presidium of the Russian Academy of Sciences.

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chairman of the section "Biological Motility"
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