

CYTOSKELETON — INTRODUCTION

Cytoskeleton is a network existing in all eukaryotic cells that is formed by three major filamentous protein systems, i.e. microtubules (with the diameter of about 24 nm), intermediate filaments (with the diameter of about 10 nm) and actin filaments, known also as microfilaments (with the diameter of about 6 nm). These systems are interconnected both structurally (through the proteins linking the particular types of filaments) and functionally. The cytoskeletal network also interacts directly or indirectly, through the complicated protein complexes, with plasma membranes and membranous organelles, and through the membrane-associated proteins, with extracellular matrix. In spite of its name suggesting mainly supporting functions cytoskeleton is a very dynamic structure. It is known that activation by extra- or intracellular stimuli leads to the rapid reorganization of cytoskeleton network and not only during changing the cell shape or initiation of cell migration. Microtubules and microfilaments serve also as the tracks for motor proteins, molecules that utilize chemical energy to transport membranous organelles, protein or mRNA complexes as well as to relatively translocate filaments, etc. At last, some of cytoskeleton acts not only as the effector of extra- or intracellular information but can also actively transform and transmit an information. Usually cytoskeletal proteins are highly conserved, particularly actin and tubulin, very often the amino acid sequence of the certain protein is nearly identical both in protozoans and vertebrates. Also, it is

quite frequently shown that the protozoan or insect proteins can replace in cell their human counterparts. Cytoskeleton-like proteins have also been found recently in prokaryotic cells.

The idea of this issue of "KOSMOS" arose after one of the domestic conferences on cell biology during which several sessions devoted to cytoskeleton took place. While discussing our post-conference impressions we have realized that so far none of the Polish biological journals published a monographic issue on this intriguing subject. So we applied to "KOSMOS", the life sciences journal known to publish professionally edited monographies. When our application to prepare an issue on cytoskeleton was met with a kindly reception we invited several scientists, working in this area, both in domestic and foreign laboratories, to participate in this project. Some of them agreed with an enthusiasm, some due to variety of reasons could not accept our invitation. Despite our efforts to cover the problem as broadly as possible, the task was not fully completed. And honestly it could not, since it was impossible to insert the data published in hundreds of thousands articles in one issue of the journal.

We would like to inform the readers who got interested in the problems related to cytoskeleton that the next issue of "KOSMOS" is devoted to molecular basis of movement in biological systems. Nevertheless it is known that the systems responsible for cell locomotion as well as muscle contractile apparatus are simply the highly specialized structures of cytoskeleton.

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