

INTRODUCTION

The study of amoeboid movement, a directed locomotion of such motile cells which never develop any permanent motor organelles, has been for many years focused mostly on the large unicellular amoebae, that is on the protozoan cells. However, the leukocytes, lymphocytes, fibroblasts and many other metazoan cells belonging to the various tissues, are also capable of autonomous locomotion. Their locomotory patterns often present special features. Nevertheless, most investigators agree to the existence of common mechanisms operating among the large variety of the motile cells. The crucial problem is then to elucidate the universal principles of cell migration.

Different new techniques were recently developed for examining the cell as a whole and exploring functions of its constituent macromolecules. Among these methods, the immunofluorescence and DNA recombination procedures permit looking into the mechanisms of amoeboid movement at the molecular level. During the last years much has been learned about the cytoskeletal network bordering the margins of the nonmuscle motile cells, its interactions with the cell membrane and their common contribution to cell locomotion.

That last topic is discussed by A. Grębecki in the article *Membrane and cytoskeletal movements in amoeboid cells*. The experimental data concerning motor relations between the cytoskeleton, membrane and cell surface during locomotory and non-locomotory movements are reviewed and compared in the free-living amoebae and tissue cells.

The second paper in this volume *migration of epithelial cells* by W. Korohoda, deals about locomotion of the keratinocytes, which became recently very popular in the cell motility studies. The article brings a large body of information about the molecular background of their motion, role of the cytoskeleton, relations between the cell shape and locomotion and factors modulating cell migration.

The locomotion of macrophages and the role of their migration in the inflammatory process is the subject of the article *Macrophages - Migrating and phagocytizing cells of immune system* by J. Kołodziejczyk. The spatial organization and regulation of the macrophage actin cytoskeleton is described, and the surface proteins that mediate macrophage adhesion and migration to the inflammation sites.

W. Kłopocka reviewed the migration of lymphocytes which are, like the leukocytes, an invasive, infiltrative cell type. The recirculation, adhesion to a specialized endothelium type and homing of the lymphocytes, are described as

components of their behaviour in the organism, which is generally under the control of histocompatibility system.

In my article *Tissue cell migration — Some factors limiting and stimulating motility* on the first place the correlation is shown between the loss of intercellular connections and cell invasiveness. Then, the influence exerted on cell locomotion by motogenic cytokines, such as Scatter Factor, Migration Stimulating Factor and Autocrine Stimulating Factor, is discussed.

The important role of Ca-binding proteins, as markers of cell and organism pathologies, is the subject of the article written by J. Kuźnicki and J. Kordowska. It seems significant that of the S-100 protein belonging to that group, is present in the highly metastatic cells, as melanoma.

In the last paper, P. Pomorski explains the principles of confocal microscopy and shows the scope of its applications in the cell biological research. The article is illustrated by some results produced with the confocal microscope installed in the Nencki Institute of Experimental Biology, in Warsaw.

When undertaking the initiative of preparing this special issue of *Kosmos* dedicated to the cell motility and migration I was in a large extent directed by my own fascination for that problem. I was therefore lucky that some colleagues have shared my enthusiasm and took on them the task of writing the reviews in the fields of their interest.

Lucyna Grębecka