ELSEVIER

Biophysical Chemistry

www.elsevier.nl/locate/bpc

Biophysical Chemistry 82 (1999) 81–82

Foreword

This special issue consists of a collection of papers based on the presentations at 'The Third International Membrane Research Forum' held at Nagoya University in Japan, 29–31 March 1999. Since most of the papers were written during the summer months of 1999, they are newer than the presentations at the meeting in March. This forum has been held annually since 1998 (first in Tokyo, and thereafter in Nagoya), and was attended by over 120 participants each time. It has been organized by Jiro Usukura and Masahiro Sokabe, both from the Medical School of Nagoya University, and one of the editors of this volume (Akihiro Kusumi).

The forum is dedicated to four objectives. First of all, it is an attempt to bring together scientists with different backgrounds who are working on biological membranes. In this forum, the organizers try to provide a common platform for scientists working on various aspects of membrane biology. The aim is 'synthesis' rather than specialization. We believe that the time is ripe for synthesizing the current biological and physical knowledge about the membranes of cells.

Second, the organizers emphasize new technologies, which either are being used or may be useful in the future in membrane research. They place a special emphasis on microscopy, which can be used to visualize or manipulate individual molecules with nanometer and piconewton precision, as depicted in the cartoon in Fig. 1.

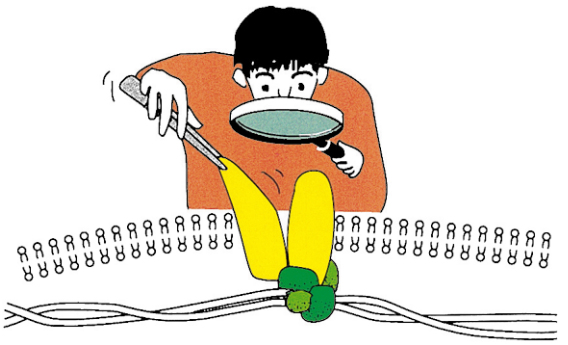

Fig. 1. Concept of microscopy for visualization and manipulation of single molecules with nanometer–piconewton precision.

A third point of emphasis, which the forum featured this year, is the interactions between membranes and the cytoskeleton. Since many cellular functions are carried out by the collaborative action of these two structures, and since the formation, integrity, and traffic of membranes strongly depend on the cytoskeleton, knowledge of these interactions is important.

The fourth important point is membrane domains (Fig. 2). This term is used in a very broad sense, covering non-random assemblies of membrane molecules that may exhibit a wide range of sizes and lifetimes. These assemblies include very small and transient domains made of several proteins or lipids on the one hand, as well as large and stable assemblies, such as cell-to-cell adhesion domains and the apical or basolateral membranes of epithelial cells, on the other hand. In addition to these two extreme cases, this year's forum featured something between these two extremes, namely, detergent-insoluble rafts and coated pits.

PII: S0301-4622(99)00107-6

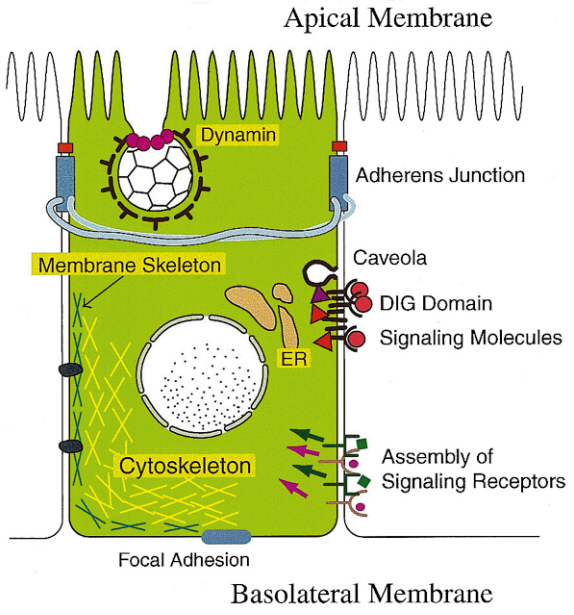

Fig. 2. Various membrane domains discussed in the Third International Membrane Research Forum.

Since this forum was held in Japan, 80% of the participants were Japanese. As they have opportunities to listen to fellow Japanese scientists in domestic meetings, all of the longer lectures (40 min), called 'Keynote Lectures', were given by invited speakers from outside Japan, and these excellent lectures essentially set the tone of the meeting. These speakers did wonderful jobs, and we would like to acknowledge them here, particularly as not all of them could accept our invitation to write for this special issue: Barbara Baird from Cornell University; Sandor Damjanovich from the University Medical School of Debrecen; Evan Evans from the University of British Columbia; Ken Jacobson from the University of North Carolina; Anne Kenworthy from Johns Hopkins University; Gerard Marriott from the Max Planck Institute; Laszlo Matyus from the University Medical School of Debrecen; Stuart McLaughlin from the State University of New York at Stony Brook; Mark McNiven from the Mayo Foundation; Henry Metzger from NIAMS, NIH; and Lawrence Shapiro from Mount Sinai School of Medicine.

The Third International Membrane Research Forum was supported by the Ministry of Education of the Japanese government, the Nanobiology Committee of the Advanced Technology Institute, and ERATO of Japan Science and Technology Corporation.

We hope this volume conveys the excitement and the flavor of the Membrane Research Forum to the readers as well as the new knowledge and the concepts presented here.

We thank Junko Kondo for her help in preparation of Figs. 1 and 2.

Akihiro Kusumi
Japan

Ichiro Hatta
Japan