

INTRODUCTION

For each of the past several years, the Bioenergetics Group of the Biophysical Society has sponsored a workshop to exchange ideas in this provocative area of research. The workshops have been held on the Sunday preceding the regular Biophysical Society program. Previous workshop topics have been: Organelle Biogenesis (1972); Lipid-Protein Interactions in Membranes (1973); ATPases of Energy-Transducing Membranes (1974).

This year's topic was Membrane Bioenergetics. It was divided into three subtopics, each with a moderator and several invited speakers to focus on key points of view and/or experimental approaches. The short, formal presentations were followed by questions and discussion by the speakers, the invited panel, and the audience. Some have expressed the view that the workshop represented one of the highlights of the Biophysical Society Meeting and should be made available in printed form. To this end, we are including some of the formal presentations in this issue of the *Journal*.

The decision to publish the proceedings came belatedly, so the organizers are especially grateful to those speakers who managed to submit manuscripts on short notice, as well as to the moderators, who have summarized the salient points of view and the discussion. At the suggestion of the Editor, an *ad hoc* Advisory Board was formed to review the papers submitted for publication. This advisory board consisted of D. C. Tosteson (chairman, "Carriers and Channels"); J. K. Blasie (chairman, "Detection of Lipid Lateral Phase Separation"); B. Chance (chairman, "Charge Distribution"); A. Scarpa (Bioenergetics Group program chairman); and S. Fleischer (Bioenergetics Group past-chairman).

The central theme is concerned with dynamic aspects of membrane function, and the subtopics address the following three questions: How do components cross the membrane barrier? What types of motion do membrane components undergo? In energy transduction, what molecular detail is involved in charge-separation related to the development of proton gradients and membrane potential?

The notion of carriers and channels is best developed from studies on nerve excitation and on the interaction of ionophores with lipid-bilayer model membranes, and the speakers were selected from this area of research. Molecular motion and phase changes in the membrane are viewed from the vantage point of different biophysical techniques, i.e., X-ray diffraction, calorimetry, freeze-fracture electron microscopy, and magnetic resonance. Finally, charge distribution is discussed from the point of view of several different experimental systems. In reality, the three subtopics may represent similar basic phenomena whose differences could be amplified by these divergent approaches and concepts.

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