

DETECTION OF LIPID
LATERAL PHASE SEPARATION

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The complex phase behavior of lipids in artificial lipid bilayer membranes and in some biological membranes has been determined through the use of several physical techniques. Since changes in several important membrane functions have been correlated with certain aspects of the phase behavior of the lipids in several biological membranes, considerable interest has recently arisen in this area of membrane biology (for a review, see "Phase Transitions in Model Systems and Membranes," by C. F. Fox in the MTP International Review of Science Biochemistry Series, Biochemistry of Cell Walls and Membranes, C. F. Fox, editor, Butterworths, London, 1975). As a result, I thought that the Bioenergetics Subgroup of the Biophysical Society might also have some interest in this area and might benefit from a discussion of some of the physical techniques used for the detection of the phase behavior of lipids in biological membranes. The following papers by Doctors Engelman, Papahadjopoulos and Poste, and Grant provide a brief description of the utility of some of these physical techniques for this purpose with adequate references for the interested reader.

THE USE OF X-RAY SCATTERING
IN THE STUDY OF LIPID
BILAYER PLANAR ORGANIZATION

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INTRODUCTION

Lamellar states of the lipids which occur in biomembranes consist of bimolecular planar aggregates. The tendency to form such arrays is a property which particularly accrues to the glycerolipids which have two hydrocarbon chains and a polar characteristic group. The tendency of such lipids to form membranous layers gave rise to many early speculations that lipid bilayers occur as the principal structural motif of mem-