

Preface

Membrane Proteins: Structure, Function and Assembly

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Membrane proteins have fundamental roles in solute and macromolecular transport, chemical and electrical signaling, bioenergetics, metabolism and regulation, and thus constitute some of the most important kinds of proteins in a cell. For this reason they are also major pharmaceutical targets. However, a deeper insight into structure–function relationships of membrane proteins requires high-resolution structural information. This is presently a serious hurdle for a rapid development of the area.

In 1986, a Nobel Symposium (No. 66) was held on the topic ‘Membrane Proteins: Structure, Function, Assembly’. At the time, only a couple of hundred protein structures had been solved of which only two were membrane proteins (bacteriorhodopsin and the photosynthetic reaction center). As of today (September 23, 2003), the Protein Data Bank contains 22 516 structures, of which 455 are annotated as membrane proteins. Even though the latter group includes some soluble domains and a number of homologous structures, the increase in the number of membrane protein structures has been dramatic in the past few years. Considering that 20–25% of all proteins in a typical cell are membrane proteins, the number of known membrane protein structures obviously represents only a very small fraction of all membrane proteins. In order

to further speed up the generation of new structures, it is essential that the methodology for structural resolution of membrane proteins is further refined and developed.

In order to assess the current situation in the field, a second Nobel Symposium on ‘Membrane Proteins: Structure, Function and Assembly’ (No. 126) was held on August 22–24, 2003, at Friiberghs Herrgård close to Stockholm, Sweden. Like the previous one, this symposium was generously supported by the Nobel Foundation through its Nobel Symposium Fund.

As a means to promote a wide dissemination of the most recent developments, the speakers at the symposium have kindly contributed articles to this unique *FEBS Letters* Special Issue. We hope that the issue will serve to convey the sense of excitement that currently prevails in the membrane protein community.

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