

Methods in ENZYMOLOGY

Volume 221

Membrane Fusion Techniques

Part B

Edited by

Nejat Düzgüneş

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DEPARTMENT OF MICROBIOLOGY

UNIVERSITY OF THE PACIFIC SCHOOL OF DENTISTRY

SAN FRANCISCO, CALIFORNIA



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ACADEMIC PRESS, INC.

A Division of Harcourt Brace & Company

San Diego New York Boston London Sydney Tokyo Toronto

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Academic Press, Inc.

1250 Sixth Avenue, San Diego, California 92101-4311

United Kingdom Edition published by

Academic Press Limited

24-28 Oval Road, London NW1 7DX

International Standard Serial Number: 0076-6879

International Standard Book Number: 0-12-182122-6

PRINTED IN THE UNITED STATES OF AMERICA

93 94 95 96 97 98 EB 9 8 7 6 5 4 3 2 1

Methods in Enzymology

Volume 221

MEMBRANE FUSION TECHNIQUES

Part B

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Preface

To commemorate the twenty-first anniversary of the publication of J. D. Watson and F. H. C. Crick's famous article on the structure of DNA, the April 26, 1974, issue of *Nature* featured a special section entitled "Molecular biology comes of age." While the origin of the field of membrane fusion research cannot be traced to a single article, two comprehensive reviews on virus-induced cell fusion and on membrane fusion appeared in 1972 and 1973, respectively (G. Poste, *Int. Rev. Cytol.* **33**, 157–252; G. Poste and A. C. Allison, *Biochim. Biophys. Acta* **300**, 421–465). In the two decades since, there has been a rapid growth in the number of studies on the molecular mechanisms of membrane fusion, culminating in several books on the subject (A. E. Sowers, ed., "Cell Fusion," Plenum Press, 1987; S. Ohki, D. Doyle, T. D. Flanagan, S. W. Hui, and E. Mayhew, eds., "Molecular Mechanisms of Membrane Fusion," Plenum Press, 1988; N. Düzgüneş, ed., "Membrane Fusion in Fertilization, Cellular Transport, and Viral Infection," Academic Press, 1988; J. Wilschut and D. Hoekstra, eds., "Membrane Fusion," Marcel Dekker, 1991). With the publication of Volumes 220 and 221 of *Methods in Enzymology* dedicated to this subject, it is not entirely inappropriate to declare the field of membrane fusion as having come of age.

The chapters in this and the accompanying Volume 220 present not only the details of methods used in membrane fusion research, but also a critical analysis of the methods, their advantages and shortcomings, and possible artifacts. While several sections focus on the elucidation of the mechanisms of fusion in various experimental systems (Fusion of Liposomes and Other Artificial Membranes; Fusion of Viruses with Target Membranes; Cell–Cell Fusion Mediated by Viruses and Viral Proteins; Conformational Changes of Proteins during Membrane Fusion; Membrane Fusion during Exocytosis; Intracellular Membrane Fusion; Membrane Fusion in Fertilization), several others describe applications of membrane fusion technology (Induction of Cell–Cell Fusion; Introduction of Macromolecules into Cells by Membrane Fusion; Protoplast Fusion). The methodology presented should be of value not only to newcomers to membrane fusion research who wish to employ some of the techniques described in these books, but also to researchers in the field who need to adopt an alternative technique.

I would like to thank the contributors to this volume, without whose willing and able collaboration this work would not even have begun. I would also like to express my appreciation for their patience with me and with their fellow authors, not all of whom were able to submit their

manuscripts at the same time. I thank Shirley Light of Academic Press for her patience, understanding, encouragement, and persistence in producing this volume, and Cynthia Vincent for her invaluable editorial assistance. I also thank my wife Diana Flasher for her constant support and enthusiasm for this project, despite countless weekends I spent editing manuscripts. Finally, I wish to dedicate this volume to my aunt Sevim Uygurer, my brother Arda Düzgüneş, and my wife Diana Flasher, in grateful appreciation of their love, support, and understanding.

NEJAT DÜZGÜNEŞ

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