Cover illustration
Micrograph of a central nervous system synapse, courtesy of John Heuser (Washington University) and Thomas Reese (National Institutes of Health).

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MEMBRANE BIOLOGY

Biological membranes surround and compartmentalize cells. They form the interface between the cell and its environment, and are key players in cellular homoeostasis and metabolic-energy transduction. This Insight provides a flavour of the many facets of contemporary membrane biology.

Biological membranes are more complex than was first thought when the 'fluid mosaic model' was proposed in 1972. Membranes are a mixture of many different types of lipidic and protein components, and their relative amounts and composition differ between functionally distinct domains. There is, however, some fluidity between these membrane compartments as vesicles bud off from one compartment and fuse with another. Ongoing studies are revealing the protein and lipidic signals that control the exquisite specificity of these dynamic vesicular processes.

Membrane proteins typically make up around a third of the proteome of a cell. Nevertheless, molecular-level understanding of membrane proteins lags far behind that of water-soluble proteins owing to the difficulty in obtaining high-resolution structural information. The recent and rapidly expanding crop of membrane protein structures is revolutionizing understanding of the principles that govern the folding of these proteins.

With a range of topics from membrane protein biophysics to the cell biology of membrane processes, this Insight introduces some of the most exciting current research in this field. We are indebted to all the authors who contributed.

We are pleased to acknowledge the financial support of Avanti Polar Lipids, which contributed towards the distribution of this Insight. As always, *Nature* retains sole responsibility for editorial content and peer review.

Deepa Nath, Senior Editor

INTRODUCTION

REVIEWS

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