The figures on the cover from the papers of S.J. Singer illustrate the appearance of the modern view of membrane structure.

Before 1966 biological membranes were generally thought to consist of a bimolecular leaflet of phospholipids with the polar heads on the outer surfaces in contact with proteins principally in $\beta$-structure conformation. Wallach and Zahler (Proc. Natl. Acad. Sci. USA 56, 1552–1559) and Lenard and Singer (Proc. Natl. Acad. Sci. USA 56, 1828–1835), in 1966, reported that membrane proteins in purified membranes, studied by infrared spectroscopy and by optical rotary dispersion and circular dichroism, had relatively little $\beta$-structure, considerable $\alpha$-helical structure, and that the polypeptides appeared to be in a nonpolar medium. Both groups suggested that the polypeptide chains of some membrane proteins might be in contact with the nonpolar regions of the lipid bilayer and might span the bilayer, as is shown in part b of Figure 1. Lenard and Singer actually proposed that the $\alpha$-helical portions of the protein would be expected to be in the nonpolar environment. Part a of Figure 1 illustrates the prevailing model of the membrane up to that time.

This hypothesis was supported by three important experiments done in the late 1960s and early 1970s. Although particles of approximately 10 nm in diameter had been observed by several investigators in the fracture surfaces of frozen membranes examined by electron microscopy, Branton suggested in 1969 (Annu. Rev. Plant Physiol. 20, 209–238) that the particles might be protein elements in the hydrophobic interior of the membrane. In 1971, Bretscher (J. Mol. Biol. 59, 351–357 and Nature New Biology 231, 229–232) used protein labeling to show that two major proteins of the human erythrocyte membrane span the phospholipid bilayer. Finally, in 1975 Henderson and Unwin (Nature 257, 28–32) showed that bacteriorhodopsin is composed of seven $\alpha$-helical segments that extend across the membrane. The current model of membrane structure, the fluid mosaic model proposed by Singer and Nicolson in 1972 (Science 175, 720–731) and incorporating these findings, is depicted in Figure 2. —Guido Guidotti
Instructions to Authors

*Molecular Biology of the Cell*, the journal owned and published by the American Society for Cell Biology, publishes papers that describe and interpret results of original research concerning the molecular aspects of cell structure and function. Studies whose scope bridges several areas of biology are particularly encouraged, for example cell biology and genetics. The aim of the Journal is to publish papers describing substantial research progress in full: papers should include all previously unpublished data and methods essential to support the conclusions drawn. The Journal will not, in general, publish papers that are merely confirmatory, preliminary reports of partially completed or incompletely documented research, findings of as yet uncertain significance, or reports simply documenting well known processes in organisms or cell types not previously studied. Methodological studies will be considered only when some new result of biological significance has been achieved with the method.

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