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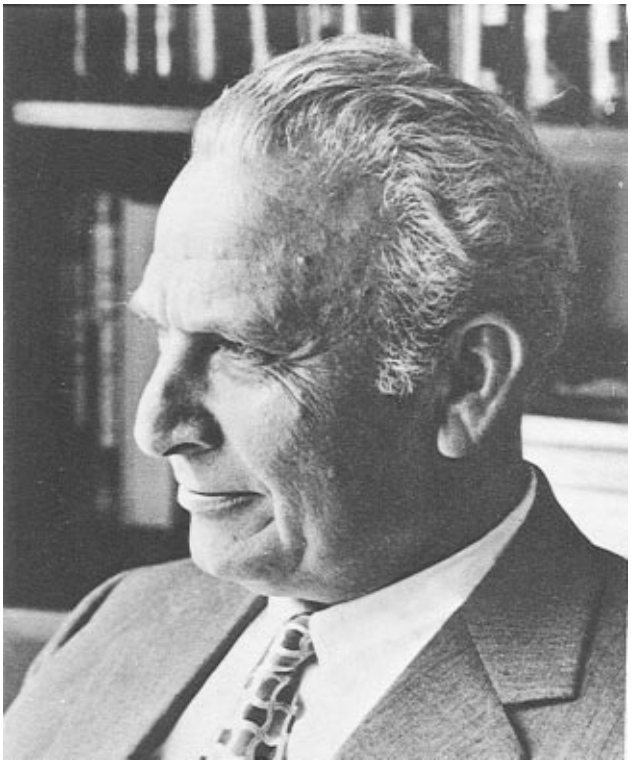

Ephraim Katchalski-Katzir

On May 16, 1996, Ephraim Katchalski-Katzir will celebrate his 80th birthday. His life story is unusual in that he has had both a distinguished scientific career and been a prominent leader of his country.

Ephraim Katchalski (as he was known before adding Katzir to his name when he accepted a political office) was born in Kiev, in the Ukraine. His family moved in 1922 to what was then the British Mandate of Palestine. At the University of Jerusalem he was attracted to the biological sciences, especially to plant physiology. He developed an interest in natural polymers, which led eventually to an interest in synthetic polymers because Staudinger had suggested that the latter might serve as models of natural macromolecules. Ephraim's work was then concentrated for many years on the study of synthetic polypeptides and the relation of their properties to those of proteins.

The first fruit of this research was the first preparation of a long-chain polypeptide, poly-L-lysine.[1] Shortly before the time this paper was published, Ephraim was invited by Chaim Weizmann, a distinguished organic chemist who became in 1948 the first president of the State of Israel, to join a scientific institute to be built in Rehovot in his honor. He was happy to accept, and he organized a Biophysics Department in Rehovot, where he led a group of brillant students (e.g., A. Berger, M. Sela, and I. Z. Steinberg) in research on synthetic polypeptides. This involved a study of the mechanism of the polymerization of *N*-carboxyamino acid anhydrides[2,3] and the synthesis of a number of linear[4−10] and branched polypeptides.[11] An unexpected phenomenon was discovered with poly-L-proline, which was found to exist in solution either as a left-handed or as a right-handed helix. Helix reversal occurs on changing the solvent medium and is a surprisingly slow process, so that its kinetics could be conveniently followed by optical activity.[12] Other important results obtained with the use of synthetic polypeptides included the discovery of a previously unknown hydrolytic enzyme which allows a prolineless mutant of *E. coli* to grow on poly-L-proline[3] and the first preparation of a fully synthetic antigen obtained by attaching tyrosine and

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glutamic acid residues to multi-poly-DL-alanyl poly-L-lysine.[14]

An important achievement of the Katchalski laboratory was the demonstration that enzymes immobilized on synthetic polymer networks not only retained their catalytic activity but could exhibit interesting changes in their specificity and pH−activity dependence.[15−17] In a particularly interesting approach to enzyme immobilization, monoclonal antibodies to enzyme antigens were used as carriers attached to the polymer network.[18] The high stability of immobilized enzymes has led to their numerous applications in industry,[19] e.g., in the use of immobilized glucose isomerase for the conversion of glucose to fructose. More recently, Katchalski-Katzir and his students I. Z. Steinberg and E. Haas studied the energy transfer between donor and acceptor fluorophores attached to the ends of a flexible chain molecule as a means to characterize the distribution of chain-end displacements and the diffusion of the chain ends toward each other.[20,21]

Scientific work, however, was only one facet of Katchalski-Katzir's life. In the 1950s Ephraim became intimately involved with public life when the State of Israel was established. He spent much time popularizing science as a lecturer in agricultural cooperatives and as an editor of *Mada*, the Israeli equivalent of *Scientific American*. In 1967 he served as a Chief Scientist of the Defense Department, and in May 1973 he was elected President of the State of Israel. His tenure of that office coincided with two dramatic events in the history of Israel, the war between Israel with Egypt and Syria in 1973 and, in an unexpected reversal of fortune, the visit of the Egyptian president Anwar Sadat to Jerusalem, which initiated the process which led to the peace treaty between Egypt and Israel. Throughout his tenure of the presidency, and in spite of all the duties of his office, Katchalski-Katzir kept up with scientific advances, particularly in the field of energy transfer, which was then the center of his scientific interest.

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Herbert Morawetz

Herman F. Mark Polymer Research Institute
Polytechnic University
Brooklyn, New York 11201

MA960265R