

Classics

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100 Years of Biochemistry and Molecular Biology

The Selective Placement of Acyl Chains: the Work of William E. M. Lands

Metabolism of Glycerolipids: A Comparison of Lecithin and Triglyceride Synthesis
(Lands, W. E. M. (1958) *J. Biol. Chem.* 231, 883–888)



William E. M. Lands

William E. M. Lands was born in Chillicothe, Missouri in 1930. He earned his B.S. in chemistry from the University of Michigan in 1951 and his Ph.D. in biological chemistry from the University of Illinois in 1954. After graduating, he spent a year as a postdoctoral fellow at the California Institute of Technology and then joined the faculty of the University of Michigan as an instructor in biological chemistry. Lands spent the next 25 years at Michigan, eventually becoming professor in 1967.

In 1980, Lands left Michigan to head the Department of Biological Chemistry at the University of Illinois. He spent 10 years there and then moved to Bethesda, Maryland to become Senior Scientific Advisor to the Director of the National Institute on Alcohol Abuse and Alcoholism (NIH). In 2002, Lands retired from his position at the NIH.

Lands spent the majority of his scientific career studying fatty acids and has made many significant contributions to this field. One such contribution is his discovery of the phospholipid retailoring or “Lands” pathway. His initial paper showing the likelihood of acyl chain turnover is reprinted here as a *Journal of Biological Chemistry* (JBC) Classic.

In the paper, Lands incubates various tissues with [^{14}C]acetate and [^{14}C]glycerol and measures the value R , which is the ratio of [^{14}C]acetate to [^{14}C]glycerol in the diglyceride unit of the triglycerides and phospholipids produced by the tissues. Lands reasoned that if diglyc-

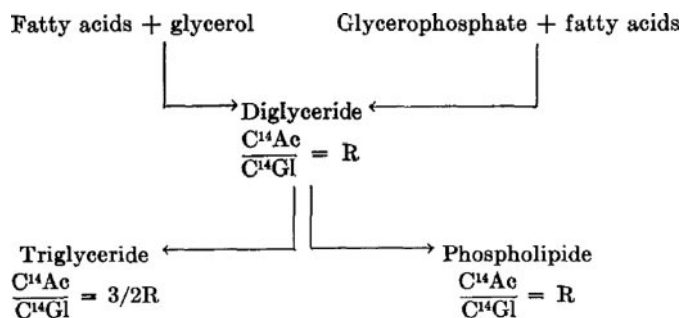


FIGURE 1

ically different in some respect from that of the triglycerides." This initial finding led to a series of papers published in the *JBC* describing the selective placement of acyl chains by phospholipid acyltransferases (1–4).

In addition to the above research which helped to explain the metabolic process that regulates the mixture of acyl chains found in lipids, Lands is also credited with discovering the beneficial effects of balancing excess ω -6 fatty acids with dietary ω -3 fatty acids.

In recognition of his contributions to science, Lands received the Glycerine Research Award (1969), the Canadian Society of Nutritional Science Lectureship (1991), and the American Oil Chemists' Society Supelco Lipid Research Award (1997). The University of Michigan's Department of Biological Chemistry has also endowed a lectureship in honor of Lands. He has also served on the editorial boards of several journals, including those of the *Journal of Lipid Research*, *Biochimica et Biophysica Acta*, *Lipids*, and *Prostaglandins*.

Nicole Kresge, Robert D. Simoni, and Robert L. Hill

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eride is the sole precursor of phospholipids, these two compounds should have the same R value. Also, because a third fatty acid molecule is added to the diglyceride unit to form triglycerides, they should have a $3/2$ R value (see Fig. 1).

However, Lands' results showed that R is 2–4 times higher in phospholipids than in triglycerides, suggesting to him that "the diglyceride unit of the phospholipids is metabol-