Siakotos, Fleischer and Zeman to Head Subcellular Particulates Course

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Organizers of the A.O.C.S. short course on Subcellular Particulates have been active in the study of chemical aspects of lipids in normal cellular components and in genetically controlled diseases.

A. N. Siakotos

A. N. Siakotos, Chairman of the Course, received his Ph.D. from Cornell University in 1958. His first professional position was research chemist in the Medical Research Laboratories at Edgewood Arsenal, Maryland. At the present time he is Assistant Professor of Pathology at the Indiana University Medical Center in Indianapolis, Indiana. Some features of his research specialties are developing procedures for the isolation of gram quantities of pure subcellular particulates from large normal and pathological brain samples. He has isolated several structures of interest in pathology, including brain lipofuscin or "age pigment", endothelial cells, myelin, and other particulates.

Sidney Fleischer received his Ph.D. from the University of Wisconsin in 1956, followed by post-doctoral fellowships at Indiana University and the University of Wisconsin. In 1960 he was appointed Assistant Professor at the Enzyme Institute. His present position is Professor of Molecular Biology at Vanderbilt University in Nashville, Tennessee. Dr. Fleischer's research interests include the role of lipids in membrane structure and function, enzyme and lipoprotein chemistry. He was one of the first investigators to extract and reconstitute lipid requiring membrane systems in mitochondria and is currently involved in research on membrane structural proteins.

Wolfgang Zeman received his M.D. degree from the University of Tubingen in Germany in 1945. Dr. Zeman has held positions at the University of Hamburg, Brookhaven National Laboratories, and Ohio State University. At the present time he is Professor of Pathology (Neuropathology) at Indiana University Medical Center in Indianapolis, Indiana. Dr. Zeman has many research interests, among them degenerative diseases of the nervous system and effects of ionizing radiation on nervous tissues. Among the degenerative disorders, his principal interest is Batten's disease, a condition resulting in the accumulation of lipofuscin in the brains of young children. Recently a research team under his direction has isolated and identified measles virus as the causative agent in subacute sclerosing panencephalitis.

A.O.C.S. Short Course at Indiana University Medical Center to survey present status of subcellular particulate isolation technology as applied to medical and biochemical research in lipids.

Major advances in scientific knowledge have always been preceded by new developments in scientific technology. The availability of gas-liquid chromatography, the use of ion-exchange celluloses and the application of thin-layer chromatography to problems in lipid chemistry have been followed by the most progressive decade of research on the role of lipids in basic life processes. A key factor in the determination of the role of lipids in cellular and subcellular phenomena has been the lack of exact information on the true membrane composition of subcellular structures in normal and diseased organelles. To date much of this data is more confusing than enlightening because of the impurities in many subcellular preparations. The current availability of improved centrifuges, rotors and other techniques offers the technological means for research on the structure-function relationships of lipids in the specialized membranes of normal and diseased cells.

This short course brings together scientists and medical research workers interested in the elucidation of problems in normal ultrastructure, ultrastructure in disease and experimental pathology, isolation of subcellular structures from organs by new techniques and the interpretation of results of lipid composition studies on these isolated subcellular elements.

The close relationship of the pathologist and the biochemist is best exemplified by the interest of the biochemist in the availability of new and unusual structures for studying variations in morphology and chemical composition on function at the macromolecular level. The pathologist, on the other hand, sees many such structures as a process of disease and is interested in their respective roles as active or passive contributors to the pathogenesis of a disease. It is obvious then, that this course has much to offer investigators in these and related areas because the subcellular approach to disease or biological studies provides the rationale for isolating normal and unique subcellular elements for morphological, chemical and biochemical characterization of such particulates, which may occur infrequently in whole tissues.

Briefly, the course will start with an introduction to the goals of the program. The normal ultrastructural picture will be presented along with fine points on artifact detection and methods of procedure. Histochemical methods at the electron microscope level offer insights on the role of normal and abnormal enzyme distributions, characteristic of each subcellular entity. Problems unique to neuropathology, which are amenable to the subcellular approach will be presented next. In many diseases pigment deposition generally occurs as a result of lipid peroxidation; some features of one of these diseases will be covered. Problems in experimental and general pathology which are most susceptible to particulate isolation techniques will close the first section of the program.

Leading the second section will be isolation technology for organs other than brain, followed by techniques applicable to the mass isolation of pure particulates from brain. The application of zonal centrifuges to tissue particulates and the monitoring of such separations by automated assay

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Sidney Fleischer

Wolfgang Zeman