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NOTES	Cancer Funds
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Responsible Investigator: H. Tarver
University Department: Physiological Chemistry
Financial Support 1954-55: ACS \$ 7,500.00; PHS \$ 9,663.00.

Title of Project: Protein Metabolism with Isotopes.

In support of previous results obtained in rats, it has now been shown that ethionine, an unnatural amino acid analogous to the naturally occurring protein constituent methionine, may be incorporated into the proteins of a protozoa. This observation shows that abnormal proteins may be formed under special circumstances, and it may be suggested that abnormal proteins may arise under other conditions, for example in cancer.

Publications:

Steinbock, H. L., and Tarver, H. Plasma Protein. V. The Effect of the Protein Content of the Diet on Turnover. J. Biol. Chem., 209:127-132, 1954.

Ulrich, F.; Li, C. H.; and Tarver, H. Electrophoresis of Rat Plasma. Arch. Biochem. Biophys., 50:421-426, 1954.

Ulrich, F.; Tarver, H.; and Li, C. H. Effects of Growth and Adrenocorticotrophic Hormones on the Metabolism of Albumin in Hypophysectomized Rats. J. Biol. Chem., 209:117-126, 1954.

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Responsible Investigator: Robley C. Williams

University Department: Virus Laboratory

Financial Support 1954-55: ACS \$ 8,964.00; PHS \$20,298.00.

Title of Project: ACS Electron Microscopic Studies of the
Physical Properties and Growth Phenomena of Protein
Macromolecules.

The aim of this project is to study with the electron microscope the structure of viruses, both in purified and intracellular stages, and to disclose something about their mechanisms of growth. Progress has been obtained during this last year in developing methods for partitioning certain cells and viruses, and in disclosing some structures within them. Work is now in progress in developing selective stains and chemical reactants which will provide for the identification of growing viruses as they are seen in thin sections of infected cells.

Title of Project: PHS Electron Microscopic Study of the
Structure of Viruses and of Their Growth in Infected Cells.

The aim of this project is much the same as the aim of the ACS project: to learn more, with the aid of the electron microscope, of the structure of purified viruses and intracellular viruses. Progress has been made in the isolation and purification of some new plant viruses, and in determining (with the aid of freeze-drying) the three-

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Williams

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dimensional shape of some of the well-known plant viruses. A novel technique for replication of cut surfaces of frozen, infected plant cells has been developed, with the aim of further elucidating our knowledge of the location and appearance of the developing viruses within these cells. Much attention has been paid to improving sectioning techniques, as applied to tissue-cultured human cells, and the growth of an animal virus within these cells has been followed. Problems of selective staining of viruses have been undertaken.

Publications:

Backus, R. C. Adhesion Partitioning: Intracellular Observations on Normal E. coli and T2 Bacteriophage. J. Biochem. and Biophys. Cytology, (in press).

Steere, Russell L. Concepts and Problems Concerning the Assay of Plant Viruses. Phytopathology, (in press).

Williams, Robley C. Significance of Electron Microscopy of Particulate Material from Normal and Diseased Cells. Proceedings of the Second National Cancer Conference, 1412-24, published in 1954.

Salton, M. J. R., and Williams, Robley C. Electron Microscopy of the Cell Walls of Bacillus megaterium and Rhodospirillum rubrum. Biochim. et Biophys. Acta 14:455-58, 1954.

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Williams

Backus, Robert C., and Williams, Robley C.
 Centrifugation in Field-Aligning Capsules: Analytical
 Centrifugation in Preparative Rotors. Arch. Biochem.
 and Biophys. 49:434-41, 1954.
 Williams, Robley C. The Electron Microscopy of
 Viruses. Advances in Virus Research, Vol. II, Academic
 Press, (in press).

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