

Nutrition Clinic Laboratory Closes After 22 Years

Did you know that more vitamins and their variants have been discovered or characterized at UT-Austin than anyplace else in the world? This was due to the efforts of Roger J. Williams (Professor and Professor Emeritus from 1940 to 1986) and his colleagues in the Biochemical Institute,* which he founded in 1940.

Professor Williams had long emphasized the importance of nutrition in preventing and fighting disease and of tailoring nutrition to meet individual differences in needs—part of his concept of “Biochemical Individuality.”

Professor William Shive (Professor and Professor Emeritus from 1944 to 2001), a long time colleague of Dr. Williams, started the Biochemical Institute’s Nutrition Clinic Laboratory about 1980 with the goal of developing new methods to evaluate the unique nutritional biochemistry of individuals. Over the past twenty-two years before closing its laboratory in October 2003, the Clinic has worked with nearly 3,500 patient volunteers.

Both Williams and Shive believed that tests that could evaluate nutritional individuality would advance nutritional science and its integration into medical practice. Common blood and urine tests measure amounts of nutrients present, but do not determine whether those amounts meet an individual’s biochemical needs. A person’s nutritional needs may vary greatly depending on their genetics, disease susceptibilities, and environment—including exposure to pharmaceuticals that interact with nutrients.

Williams, Shive and others at the Institute, supported by the Clayton Foundation, had pioneered the use of living microorganisms for nutritional and biochemical research. So it was natural that Shive sought to similarly test live human cells for their ability to grow in culture media with controlled

amounts of nutrients. Skin cells were considered, but potential subjects are more willing to give blood samples, so lymphocytes were selected for study. Shive first had to develop a chemically defined, protein-free, medium that would support the growth and proliferation of human lymphocytes. The medium finally selected contains only purified substances, including glucose, amino acids, vitamins and minerals—35 cell nutrients in all.

As single nutrients are omitted from the medium, the growth response of the cultured lymphocytes from different individuals differs greatly. Poor growth implies either low cellular reserves or high biochemical needs, and suggests that the cell donor would benefit from greater dietary or supplemental intake of that nutrient. Shive also developed more complex media variations to test the functioning of specific biochemical pathways, such as the adequacy of folic acid for conversion of serine to glycine, or homocysteine to methionine. Still other variations measure the ability of cells to resist various biochemical stresses, including pharmaceuticals.

The Clinic made its first nutritional recommendations to volunteers in 1981. Many subjects reported impressive and diverse health benefits and returned faithfully for annual repeat testing, in some cases for 15 or 20 years. New volunteers were seldom in short supply, being referred to the Clinic by word-of-mouth or by interested physicians.

Research publications from the Clinic deal with development of the lymphocyte culture medium and new knowledge about the biochemical roles of sulfite and asparagine in human lymphocytes. A recent report deals with prevention of toxicity from statin drugs by means of coenzyme-Q₁₀ and an unidentified plasma protein. The Clinic also collaborated with the



Dr. Flora Pettit, Dr. Don Davis, and Elaine Hrissikopoulos

School of Nursing on a study of breast cancer patients, with the Texas Neural Tube Defect Project of the Texas Department of Health, and with the A-T Project, a study of the rare genetic disease, ataxia-telangiectasia. Although the Clinic has closed its laboratory, analysis of the data continues.

Since 1984, Dr. Flora H. Pettit has directed the Nutrition Clinic laboratory. Dr. Donald R. Davis joined the group part-time in 1986, helping with data analysis and controlled trials in groups and single subjects. Elaine Hrisikopoulos has been the public voice of the Clinic since 1992, taking calls from new volunteers, scheduling about 15 laboratory tests per week, and tabulating research questionnaires from subjects.

The Clayton Foundation for Research, to whom Shive donated his patent on the lymphocyte culture medium, supported the Nutrition Clinic for many years. More recently, it has been supported by the Shive Foundation, donations from grateful subjects, and Austin philanthropists, Ronya and George

Kozmetsky. Professor Emeritus Shive died in 2001 and Dr. Pettit plans to retire in January 2004. The Clinic's technology has been substantially transferred to SpectraCell Laboratories, Inc., which has performed lymphocyte culture testing for physicians and patients since 1992 at its laboratory in Houston.

The human genome project and the search for genetic factors in disease susceptibility add new interest in the Nutrition Clinic's goals of testing for individual differences in nutritional biochemistry. The Clinic's work, and that of those who follow, will hopefully bring closer the time when sophisticated nutritional testing and awareness will become common practice in medical treatment and preventive medicine.

— Donald R. Davis

** You can learn more about Roger Williams, William Shive and the Biochemical Institute on our departmental web site at: <http://www.cm.utexas.edu/bioinst/>*



View of the newly redesigned south plaza of Welch Hall looking toward Inner Campus Drive. The new plaza, recently resurfaced to stop rainwater leaks into classrooms below, has become a popular venue for relaxation, study, dining and even outdoor class sessions on sunny fall days.