UC Scientist Wins "American Nobel" Research Award

Published September 2004

UC faculty member Elwood V. Jensen, PhD, a pioneer in the field of endocrinology and breast cancer, has received the prestigious Lasker Award for Basic Medical Research.

The Lasker Awards are known as "America's Nobels," largely because of the extremely rigorous nomination and selection process conducted by a jury of the world's top scientists. After winning this most coveted prize in biomedical research, in fact, many recipients have gone on to receive the Nobel Prize in Physiology or Medicine.

"We're absolutely ecstatic that one of our own at the University of Cincinnati has been recognized for the work he did," said Jane E. Henney, MD, senior vice president and provost for health affairs at UC. "The Lasker Awards were established by Albert and Mary Lasker to really recognize scientists who are making a difference. It has become one of the premier and widely acclaimed awards to honor people who are just a breath away from the Nobel Prize."

Dr. Jensen, visiting professor in the Department of Cell Biology, Neurobiology and Anatomy at UC Medical Center's Vontz Center for Molecular Studies, is revered worldwide for his discovery of hormone receptors, which brought about a revolution in molecular science and transformed the treatment of breast cancer patients.

He shares the award with two other nuclear receptor pioneers, Ronald M. Evans, of the Salk Institute for Biological Studies, and Pierre Chambon, of the College de France, Strasbourg.

Dr. Jensen became the second UC faculty member to receive a Lasker when the award was officially conferred at a ceremony Oct. 1 at the Pierre Hotel, New York. The first UC recipient was Albert Sabin, MD, developer of the oral polio vaccine (Clinical Medical Research, 1965).

Dr. Jensen did most of the work for which he has been honored while on the faculty of the University of Chicago in the 1950s.

Dr. Jensen's Research
Dr. Jensen's studies on estrogenic hormones completely revolutionized the understanding of how steroid hormones work, and in doing so he made a major contribution to the treatment of breast cancer. According to the Lasker Foundation, his work has transformed the treatment of breast cancer patients, and saves or prolongs more than 100,000 lives annually.

His discovery that one-third of breast tumors have "receptors" specifically for estrogen, which causes cancer cells to proliferate, has made it possible to target this group of women for hormone therapy. The remaining "receptor negative" patients are now spared from a treatment that will not help them, and can start earlier on alternative therapies that will.

Dr. Jensen's landmark discovery of hormone receptors—which earned him the honor of being the "father" of the now burgeoning nuclear receptor field—has had a major impact on the treatment of breast cancer, and estrogen receptor analysis of breast cancers for therapy selection is now standard clinical practice.

During the 1950s, when Dr. Jensen was doing his work in Chicago, investigators had been focusing on estrogen's influence on the enzymes involved in biosynthesis. Dr. Jensen, however, took a different approach. As he puts it, it was like the early European mountaineers who decided to climb the Matterhorn (which he himself once did) by what at the time appeared to be the most formidable face—only to discover that it was the better way to go.

Instead of asking what the hormone does to tissue, Dr. Jensen decided to learn what happens to the hormone itself. That approach took him to the scientific summit.

But first he had a problem to overcome. He had to invent a way to measure hormones with greater accuracy than had been possible before. This he achieved by "labeling" the hormone estradiol with the radioactive isotope tritium, which can be detected in cells in amounts as unimaginably small as one-trillionth of a gram.

Dr. Jensen was about to open up to molecular science an exciting new area of study.

Using his new tritium labeling technique, Dr. Jensen discovered that a third of all cancer patients had receptors that bound with estrogen, which in turn triggered cancer cell proliferation. Since only a third of breast tumors carry estrogen receptors,
a biopsy can now determine which women have them and are therefore candidates for anti-estrogen therapy. Patients who do not have the receptors are therefore spared from a treatment that will not help them. Instead, the receptor-negative patients, whose tumors are not dependent on estrogen, can now receive the more aggressive chemotherapy and/or radiation treatments sooner, before the cancer spreads.

Dr. Jensen also was able to purify the receptor protein and prepare specific antibodies to it, the first time this had ever been done for any steroid hormone receptor. This work provided physicians with a reliable tool for measuring the amount of receptor in tumors, enabling them to better decide in which direction treatment should proceed.

In the 1970s, a time when many clinicians did not consider anti-estrogen compounds to be very effective against breast cancer, Dr. Jensen and his Chicago colleague Craig Jordan, PhD, also showed that the anti-estrogen compound tamoxifen worked well in many women with large amounts of estrogen receptor. The clinical results from simply taking a pill saved patients from undergoing the more aggressive anti-hormone approach--removal of the ovaries and the adrenal glands--which has long been known to stop tumor growth in one of three patients.

Dr. Jensen and his colleagues Sohaib Khan, PhD, of UC's Department of Cell Biology, Neurology and Anatomy, and Tom Burris, PhD, of the Eli Lilly Company, are currently studying Dr. Jensen's latest finding--that the estrogen receptor has in fact two binding sites for tamoxifen--and determining its significance in the treatment of breast cancer.

The Lasker Awards

The Albert Lasker Medical Research Awards, "America's Nobels," are the nation's most distinguished honor for outstanding contributions to basic and clinical medical research and represent the highest recognition for distinguished scientific achievement.

Since 1962, more than half of those honored with the Lasker Basic Medical Research Award subsequently received the Nobel Prize for Physiology or Medicine. In each year since 1992, the Nobel Prize has been awarded to a scientist who had previously received a Lasker Award.

First presented in 1946, the Lasker Awards are administered by the Albert and Mary Lasker Foundation. The late Mary Lasker is widely recognized for her major contribution to the growth of the National Institutes of Health and her unflagging commitment to government funding of medical research in the hope of curing devastating diseases. Her support for medical research spanned five decades, during which she was the nation's foremost citizen-activist on behalf of medical science.

Lasker Award recipients receive an honorarium, a citation highlighting their achievements, and an inscribed statuette of the Winged Victory of Samothrace, the Albert and Mary Lasker Foundation's traditional symbol representing humanity's victory over disability, disease and death.

http://healthnews.uc.edu/publications/findings/?/1936/1939/