THE 21ST ANNUAL LYLE RAMSAY DAWSON LECTURE

Established in memory of Lyle Ramsay Dawson Distinguished Professor and Former Head of the Department of Chemistry

SINGLE-NANOPARTICLE SENSORS OF NANO-BIO INTERACTIONS

TERI W. ODOM

Charles E. and Emma H. Morrison Professor of Chemistry, Professor of Materials Science and Engineering, and Associate Director of the International Institute for Nanotechnology (IIN) at Northwestern University

FRIDAY, OCTOBER 27, 2017 | 4:00 PM

DON & CATHY JACOBS

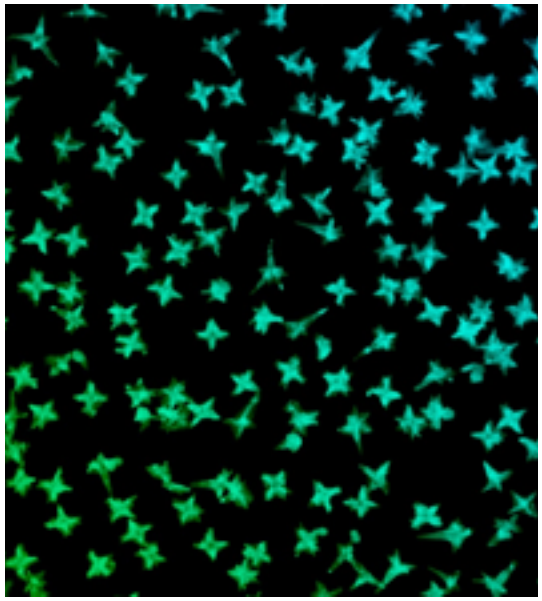
SCIENCE BUILDING, RM 321

**Reception to immediately follow.*

University of Kentucky

LECTURE ABSTRACT

Nanotechnology offers new strategies for minimally invasive and localized approaches to diagnose and treat diseases. For example, nanoparticles have been explored in a range of applications, including as drug delivery vehicles, imaging probes, and therapeutic agents. Although increased therapeutic efficacy has been realized, direct visualization of how engineered nanoparticles interact with specific organelles or cellular components has seen limited attention. Such interactions will have implications for fundamentals in cancer biology as well as in the design of translational therapeutic agents. This talk will describe how drug-loaded gold nanostars can behave as multi-spectral optical probes for interrogating how therapeutic nanoconstructs interact with cells at the nanoscale. We will focus on model cancer cell systems that can be used to visualize how gold nanostar nanoconstructs target cells, rotate on the plasma membrane, are endocytosed, and are trafficked intracellularly. We will also discuss mechanisms of cell death associated with these unique therapeutic nanoconstructs.



TERI W. ODOM

Teri W. Odom is Charles E. and Emma H. Morrison Professor of Chemistry, Professor of Materials Science and Engineering, and Associate Director of the International Institute for Nanotechnology (IIN) at Northwestern University. She is an expert in designing structured nanoscale materials that exhibit extraordinary size and shape-dependent optical properties. Odom has received numerous honors and awards; select ones include being named a U.S. Department of Defense Vannevar Bush Faculty Fellow; a Radcliffe Institute for Advanced Study Fellowship at Harvard University; an NIH Director's Pioneer Award from the National Institutes of Health; the MRS Outstanding Young Investigator Award; an Alfred P. Sloan Research Fellowship; an NSF CAREER Award; and a David and Lucile Packard Fellowship in Science and Engineering. She is a Fellow of the American Chemical Society, Materials Research Society, and Royal Society of Chemistry and is on the Editorial Advisory Boards of ACS Nano, Chemical Physics Letters, Materials Horizons, Annual Reviews of Physical Chemistry, Chemical Society Reviews, and Nano Letters. She serves as founding Executive Editor of the journal ACS Photonics (2013 -).

LYLE RAMSAY DAWSON

Lyle Ramsay Dawson was a native of Illinois and received his undergraduate degree from the University of Illinois in 1932. He received his Ph.D. degree in 1935 from the University of Iowa.

Dr. Dawson served in several academic positions in Illinois, Wisconsin, Nebraska and Louisiana and also worked on the Manhattan Project as a Research Chemist and Group Leader in the Metallurgical Laboratory at the University of Chicago. In 1946, he was awarded the War Department's Certificate of Merit and a U.S. Patent for his efforts on the Manhattan Project, which led to the discovery of a fundamental process for the extraction and purification of the elements plutonium and neptunium. He was a member of the committee that organized the Oak Ridge Institute of Nuclear Studies and was a council member of the Institute.

Professor Dawson came to the University of Kentucky in 1945 as Head of the Department of Chemistry. He provided key leadership in initiating and building the doctoral program in chemistry at the university. For example, in his first decade in the department, he individually obtained the major portion of extramural research support. During his twenty-five years with the department, he held contracts for fundamental chemical research with the U.S. Army, the National Science Foundation and the Atomic Energy Commission.

He directed or co-directed seventeen Ph.D. dissertations and nine M.S. theses. He was a talented research director and had a special ability to imbue his students with a concise, clear and complete scientific writing style. He published more than fifty research papers dealing with the chemistry of nonaqueous solutions and coauthored a reference book on the subject.

Dr. Dawson was a master teacher both in the classroom and in less formal conferences and discussions. His leadership and mentoring led many graduate teaching assistants and junior faculty members to become more effective teachers. His uncompromising devotion to high achievement standards in course-work, research, education and training set the tone for our department for years to come.

Another significant contribution to the department was Professor Dawson's indefatigable advocacy for a new chemistry building. His leadership in soliciting and designing a replacement for the former chemistry building, Kastle Hall, culminated in the opening of the current Chemistry-Physics Building in 1963.

He also served the campus community in other ways. Dr. Dawson was elected a Distinguished Professor in the College of Arts and Sciences in 1954—1955, and was appointed to the rank of Distinguished Professor in the field of Physical Chemistry by the University of Kentucky Board of Trustees in 1956. He served as Acting Dean of the Graduate School in 1954—1955, 1956 and 1960—1961.

Dr. Dawson's contributions outside the university were well recognized. He was a Fellow of both the American Institute of Chemists and the American Association for the Advancement of Science. He was a member of the American Chemical Society, Electrochemical Society, Sigma Xi, Omicron Delta Kappa, Alpha Chi Sigma and Kappa Delta Pi, serving leadership roles in each of these organizations. He served several times as a Tour Lecturer and Visiting Scientist under the sponsorship of the American Chemical Society. He was also active in a variety of other nonacademic organizations.

Dr. Dawson's twenty-five years in the department represent a truly outstanding combination and balance of administrative leadership, teaching, research and service. Although Dr. Dawson passed away in 1976, his impact on the department continues to this day. The endowment of the Lyle Ramsay Dawson Lecture Series by his beloved daughter, Venita Dawson Curry, permits us to rejoice in this legacy and to continue our tradition of world-class chemical research.

Questions and comments about the Dawson Lecture can be directed to Dr. Doo-Young Kim.
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