BME Seminar
Friday, December 2, 2016
UTEB 150 at Storrs & Videoconferenced to UCHC CG-079B
12:00-12:50 pm

“Single Molecules and Single Cells: Using Microwell Array Technology to Probe Chemistry and Biology at their Fundamental Limits”

Dr. David R. Walt, University Professor, Howard Hughes Medical Professor, and Adjunct Professor of Biomedical Engineering at Tufts University

Abstract: We have developed microwell arrays as a platform for performing bioanalytical measurements. These arrays can be used for performing high-throughput analysis. The microwells can be used as miniature reaction chambers to detect single molecules. This method has been used to measure the concentration of proteins and nucleic acids more than a thousand times lower than traditional assays. This ultrasensitivity provides the ability to measure the small number of molecules present in individual cells. The translation of these technologies from the laboratory to the clinic as well as to the commercial sector will be described.

Biography: David R. Walt is University Professor, Professor of Genetics, Professor of Biomedical Engineering, Professor of Neuroscience, and Professor of Oral Medicine at Tufts University and is a Howard Hughes Medical Institute Professor. He is co-chair of the National Academy of Sciences Board on Chemical Sciences and Technology. Dr. Walt is the Scientific Founder and former Director of Illumina Inc. and the Scientific Founder and Director of Quanterix Corp. He is currently serving as co-chair of the National Academies of Science, Engineering, and Medicine Committee on the Future of Center-Based Engineering Research. Dr. Walt has published over 300 peer-reviewed papers and has over 75 issued US patents. He has received numerous national and international awards and honors for his fundamental and applied work in the field of optical microwell arrays and single molecules including the American Chemical Society Kathryn C. Hach Award for Entrepreneurial Success (2017), Ralph Adams Award in Bioanalytical Chemistry (2016), the American Chemical Society Gustavus John Esselen Award (2014), Analytical Chemistry Spectrochemical Analysis Award (2013), the Pittsburgh Analytical Chemistry Award (2013), and the ACS National Award for Creative Invention (2010). He is a member of the National Academy of Engineering, a member of the National Academy of Medicine, a Fellow of the American Academy of Arts and Sciences, a Fellow of the American Institute for Medical and Biological Engineering, and a Fellow of the National Academy of Inventors. He received a B.S. in chemistry from the University of Michigan and a Ph.D. in chemical biology from SUNY at Stony Brook, and did postdoctoral studies at MIT.