

Department of Bioengineering University of Washington

“Decentralizing the Healthcare System, One Microfluidic Diagnostic System at a Time”

January 3, 2008 (Thursday) 1:15 - 2:15 P.M.
William H. Foege Building, N130A

Paul Yager, Ph.D.
Professor and Acting Chair
Department of Bioengineering

If the 20th century was the time when western medicine perfected its practices by concentrating people and sophisticated instruments in centralized facilities, the 21st will be a time when we move the sophistication back to the periphery of the healthcare system in the developed and the developing worlds. One tool that will be important is point-of-care diagnostics. In our lab we have focused on development of sophisticated tools for monitoring concentrations of molecules in biological fluids, largely through the development of microfluidic devices and systems. Microfluidics offers the potential to allow complex laboratory processes (now carried out by highly-trained people) to be done automatically in an inexpensive disposable device. We are currently working most on developing immunoassays that can be performed in such formats, although at present the disposable must be supported by an inexpensive table-top instrument. In the near future, we'd like to further simplify the technology needed for precise, accurate and inexpensive diagnostics to the point that they can be performed with an absolute minimum of technology beyond what we already carry in our pockets.

Dr. Paul Yager, a native of Manhattan, received his A.B. in Biochemistry from Princeton in 1975, and a Ph.D. in Chemistry from the University of Oregon in 1980, specializing in vibrational spectroscopy of self-organizing biomolecules, particularly membrane-forming lipids. After an NRC Fellowship at the Naval Research Laboratory in Washington DC from 1980 to 1982, he joined the NRL staff as a Research Chemist from 1982 to 1987. He joined the Department of Bioengineering at the University of Washington as Associate Professor in 1987. Initial projects included work on biosensors, the structure of silk, and self-organization of lipid microstructures. Since 1992, Yager has focused on development of microfluidic devices for the manipulation of biological fluids. Support from Senmed Medical Ventures and DARPA resulted in the creation, in 1996, of Micronics, Inc., a Redmond, WA-based company dedicated to microfluidic solutions for problems in the life sciences and medicine. The primary goal of current work is decentralization of biomedical diagnostic testing in the developed and developing worlds by adapting optical methods for monitoring biomolecules and microfluidics to point-of-care diagnostic systems. In 2005 Yager was awarded a \$15.4M grant from the Bill & Melinda Gates Foundation under support of their Grand Challenges in Global Health initiative; the collaborative team at UW, Micronics, Nanogen and PATH is developing a low-cost rugged point-of-care blood analysis instrument based on microfluidics for diagnosing diseases in the developing world. Specifics can be found at <http://faculty.washington.edu/yagerp/>. Since 2007, Yager has served as Acting Chair of the Department of Bioengineering at UW.