



Nanotechnology for the Enhancement of Human Health

The application of nanotechnology to the prevention and treatment of human diseases holds great promise because it involves the interaction with nanoscale biological materials. Synthetic nanomaterials that are biocompatible, non-toxic and functional in biologic (wet) conditions can be used to engineer and restore cellular function in a manner similar to how artificial joints and heart valves can restore organ function. Early applications of nanomaterials will likely involve the development of medications that take advantage of unique aspects of nanostructures interaction with biological systems to achieve or enhance therapeutic activity. Examples will be provided for the design, synthesis and analysis of therapeutic nanomaterials where distinct kinds of attached molecules allow for unique therapeutic functions. These applications include antimicrobial compounds, vaccines, drug and gene delivery, and functional imaging. These “nanomedicines” all share the capability to uniquely function simply due to their size. Future nanotechnology therapeutic applications such as cellular engineering, human performance augmentation and single molecule manipulation will be reviewed.



Wednesday, Sep. 2, 2009

4.00 PM

**1000 Micro and Nanotechnology Laboratory
Reception to follow Seminar**

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Dr. Baker joined the faculty of the University of Michigan in 1989 and is currently Professor of Medicine and Division Chief of Allergy and Clinical Immunology in the Department of Internal Medicine, Professor of Pathology, and Professor of Biomedical Engineering in the School of Engineering at the University of Michigan. In July, 1998 Dr. Baker was appointed Director of the U-M's newly organized Center for Biologic Nanotechnology and in 2001 was inaugurated as the first recipient of the Ruth Dow Doan Endowed Professorship in Biologic Nanotechnology. Following the success of the Center for Biologic Nanotechnology, in April 2005, U-M's Board of Regents formed the Michigan Nanotechnology Institute for Medicine and Biological Sciences (M-NIMBS) and appointed Dr. Baker as its first Director. Under his leadership, M-NIMBS merges academic expertise and institutional resources across the university to develop and market applications for nanotechnology in medicine, the biological sciences and the environment.