

Probing Cell Biology from a Physics Perspective



Kenneth Jacobson

Kenan Distinguished Professor, Cell Biology and Physiology

CURRENT RESEARCH

How basic cell biology research can yield applications in creating and preserving vaccines

Each year, nearly 1/2 billion people suffer from dengue infections, and there is currently no effective vaccine or drug therapy available [1]. This mosquito-borne virus causing flu-like illness, which can be fatal, is a serious threat to many in tropical and sub-tropical countries even now touching southern Florida and Texas. Vaccines must immunize against all five viral serotypes to be effective making them challenging to develop. Dr. Ken Jacobson, Kenan Distinguished Professor of Cell Biology and Physiology at the University of North Carolina at Chapel Hill, studies basic cell biology and membrane biophysics to investigate the attachment of dengue virus to the cell membrane and the subsequent steps of dengue virus infection. Dr. Jacobson not only conducts basic science research that may help lead to a dengue virus vaccine, but also merges physics with biology to develop a solar powered thermoelectric vaccine cooler to preserve vaccines, including those developed for dengue virus. This will permit more effective delivery of vaccines in the rural developing world.

Breaking new ground in scientific discovery and technique development, Dr. Jacobson was one of the early developers of digitized fluorescence microscopy who introduced its applications to cell biology. Probing cell biology from a physical perspective, Dr. Jacobson created these tools to measure the traction forces the cell must apply to crawl on a surface, and to "photomanipulate" the proteins involved in cell migration using laser beams. Currently, Dr. Jacobson works with theoreticians to further understand morphologically oscillating cells as a model for...

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AFFILIATION



University of North Carolina Chapel Hill

EDUCATION

- Ph.D. in Biophysics 1972, State University of New York at Buffalo
- M.S. in Physics 1966, University of Wisconsin
- B.S. in Physics 1964, University of Wisconsin

AWARDS

- Distinguished Biomedical Alumnus, 2013
- Gregorio Weber Award for Excellence in Fluorescence Theory and Application, 2011
- Elected as a Fellow of the American Association for the Advancement of Science (AAAS), 2008
- Kenan Distinguished Professor of Cell and Developmental Biology, 2005
- Suddath Memorial Symposium Lecture on Structural Biology, 1994
- and 1 more...

RESEARCH AREAS

Life Science, Immunology / Inflammatory, Infectious, Oncology / Cancer

FUNDING REQUEST

Your contributions will support Dr. Ken Jacobson at the University of North Carolina as he continues to develop techniques for rigorous basic and applied research in membrane dynamics and cell motility. Donations will help fund the \$500K/year required to support senior researchers, postdocs, and equipment and supplies for undergraduates. Sowing into fundamental science may help in creating dengue virus vaccines, and greatly help advance his project in developing solar-powered vaccine coolers.