Using Novel Techniques to Explore Cilia

Judith Van Houten
University Distinguished Professor, Biology

CURRENT RESEARCH

Understanding these crucial organelles can lead to effective ciliopathy drug targeting

Almost every cell in your body has a tiny appendage called a cilium. Cilia are the little organelles that stick out from cells to accomplish many things; they function as antennae and collect information about the outside world, changing that information to a form that is useful to the cell. When these organelles fail to function properly, serious diseases can follow. Dr. Judith Van Houten, Distinguished Professor at the University of Vermont explores the development and function of cilia, which are best known for their function to keep mucous moving in the lung or sperm swimming, but they also determine whether your heart will be on the right side of your chest as it should be or if you have too many fingers or toes.

If the cilia do not work on the little protozoan, it cannot swim properly or eat. If they do not work in higher organisms, the problem may manifest itself as one of many serious human developmental problems. The groups of diseases that track back to mutations in genes for components of cilia are called ciliopathies. These include sterility (from sperm motility defects or fallopian tube defects), kidney cysts (due to failure of the cilia on the cells that line the tubules to sense the flow in the tubules), mental retardation (from brain cilia defects), bone malformation (from bone cell cilia defects), extra fingers and toes, obesity, and diabetes,

Dr. Van Houten's cilia research is carried out by research assistants and undergraduates who specialize in molecular biology, genomics, and RNA and protein research. Together, they use an innovative model system that provides critical insight into the structure and function of cilia that other systems might miss. Understanding...

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AFFILIATION

University of Vermont

EDUCATION

- Ph.D. 1977,University of California, Santa Barbara

AWARDS

- Elected to the Vermont Academy of Science and Engineering, 2008
- University Distinguished Professor – Lifetime Award, 2009
- American Association for the Advancement of Science (AAAS) Fellow, 2010
- Vermont Academy of Arts & Science (VAAS) Fellow, 2010
- Inaugural Recipient of Distinguished University Citizenship and Service Award, 2014

RESEARCH AREAS

Environment, Ecology, Health IT, Informational Sciences / Internet

FUNDING REQUEST

Your contribution will help fund Dr. Van Houten's continued research exploring cilium, which are crucial for a properly-functioning body. Costs include $10K/year for conference travels and supplies, $32K/year for one graduate student, and $75K/year for one postdoctoral student. Take an active role in discovering the crucial functions cilia play in our bodies, and making novel insights for potential drug targeting of ciliopathies; fund Dr. Van Houten and her team to help advance our understanding of these critical functions.