



News from the Hereditary Disease Foundation

Alzheimer's Research Shines Light on HD

Innovative research is unlocking the secrets that link brain disorders. An exciting new study, which may have implications for Huntington's disease and other brain diseases, has found that boosting the brain's immune cell function improves Alzheimer's symptoms. X. William Yang, MD, PhD, and his team at the David Geffen School of Medicine at UCLA, reported their findings in the March 7 issue of the journal *Neuron*.



X. William Yang in Venezuela in 2002 as part of a team of HDF researchers.

William received the Leslie Gehry Brenner Prize for Innovation in Science from HDF in 2014, which helped fund this exciting and important research.

Huntington's disease, Alzheimer's, Parkinson's and other brain disorders share many features in common. They all make "clumps" which make it hard for cells to communicate. These disorders also wreak havoc with the immune system of the brain. The immune system is supposed to help by removing debris from the brain. But in people with these brain disorders, the immune system can aberrantly react and do damage.

TREM2 Gene Function

In people, a gene known as TREM2 increases the risk for developing Alzheimer's disease. William wanted to learn more about the function of TREM2 in the delicate brain ballet.

By very cleverly and imaginatively creating and using mouse models, William and his colleagues discovered a profound truth: boosting the level of TREM2 improved disease symptoms!

Elevated levels of TREM2 make the brain's immune cells more effective. Alzheimer's mice with boosted levels of TREM2 had fewer clumps. They also had fewer cognitive symptoms and began behaving more similar to normal mice.

Research Provides Hope

William is the co-inventor (with Nathaniel Heintz) of a powerful genetic engineering technology using a human chromosome put into a bacterial chromosome, called, Bacterial Artificial Chromosomes (BACs). His techniques have revolutionized how

we study and understand the brain. William's laboratory, established at UCLA in 2002, has made significant contributions to the development of novel BAC transgenic mouse models for human neurodegenerative disorders, including HD. His research team first became interested in TREM2 from observations they made in one of the HD mouse models.

In their next step of research, William and his group plan to study the molecular mechanism by which TREM2 is changing immune function in Alzheimer's mouse models and explore whether higher levels of TREM2 could also improve the immune response and disease outcomes of HD and other brain diseases.

Degenerative brain disorders, such as HD, Alzheimer's and Parkinson's, destroy so many people's lives. William and his team are making progress in unveiling the secrets about these disorders by highlighting brain's immune cells for their untapped potential in therapeutic research.

X. William Yang is a Professor at the Semel Institute for Neuroscience and Human Behavior and the Geffen School of Medicine at UCLA. He is a member of the HDF Scientific Advisory Board. He is a recipient of the BRAIN Initiative Award from the National Institutes of Health and the Brain Disorder Award from the McKnight Foundation.

<http://newsroom.ucla.edu/releases/boosting-brains-immune-cell-function-improves-alzheimers-symptoms-in-mice-study-finds>

May Is HD Awareness Month -- Together We Can Make A Difference