Understanding The Hidden Powers of T Cells

Susan Kaech
Associate Professor and HHMI Early Career Scientist, Immunobiology

CURRENT RESEARCH

Dr. Kaech's understanding of T cells will lead to more efficient vaccines that prevent a variety of viral infections and cancers

Those that have had the chickenpox can happily assume they will likely not have the chickenpox again. Fortunately, our bodies have a system that recognizes these pathogens once we have encountered them and defends our body against future infections. Dr. Susan Kaech, of Yale University, studies the process of building immunity. Dr. Kaech's work to understand how long-term immunity to pathogens is generated following infection or vaccination will likely help create better vaccines that protect against killers like Ebola, HIV, malaria, dengue, and tuberculosis for which no vaccines exists. In addition, her research explores how our immune system recognizes and attacks cancer, with the hope of generating new therapies that can jump-start our immune cells to eradicate tumors.

More specifically, Dr. Kaech studies the T cells that are responsible for recognizing pathogens and preventing future infections. In general, the process starts with "naive" T cells coming upon a pathogen the immune system has not encountered before. These T cells then multiply into millions of "effector" T cells, which shut down the infection by either killing or directing the killing of infected cells in the body. Once their job is done, 90-95% of the effector T cells die off, but the remainder persists as "memory" T cells that will remember the prior pathogen and continue to protect the body against the same infection later in life. For these reasons, her research will greatly impact the future of our health and medical advances.

Current research projects include:

- Identify Genes: Dr. Kaech identifies the genetic pathways and signals produced by the body that lead to the formation of long lived memory T...

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AFFILIATION

Yale University

EDUCATION

- Ph.D., in Developmental Biology, 1999 , Stanford University
- B.S., in Cell and Molecular Biology (Magna cum laude), 1993 , University of Washington

AWARDS

- Edward Mallinckrodt Jr. Foundation Award, 2005-2008
- Cancer Research Investigator Award, 2005-2009
- Sandler Program for Asthma Research, 2007-2010
- Presidential Early Career Award for Scientists and Engineers (PECASE), 2007
- Howard Hughes Early Career Scientist, 2009-2015

RESEARCH AREAS

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

FUNDING REQUEST

Your contributions will support Dr. Susan Kaech's investigations into the ways in which memory T cells form in order to make therapies that can help combat infection and cancer. Your donations will fund the necessary 1-1.5 million dollars per year for the costs of experiments and personnel. Your help will allow Dr. Kaech and her team to continue to make important discoveries each year.