UCI Chao Family Comprehensive Cancer Center | NIH National Cancer Institute | NIH National Institute of Allergy and Infectious Diseases | UCI Program in Public Health

Big Data Training for Cancer Research

Special Lecture Series

Tracking Exposure and Spread of Infectious Diseases

Dr. Philip Felgner

July 15, 2024, 1:00 – 2:15 PM (PDT)

Sue Gross Auditorium, Susan & Henry Samueli College of Health Sciences

Speaker Bio: Dr. Philip Felgner is the Director of the Vaccine Research & Development Center at the University of California, Irvine. His research primarily focuses on identifying crucial antigens for the development of safe and effective vaccines. He pioneered a protein microarray platform that measures vaccine-induced, antigen-specific antibody levels across a diverse array of antigens from numerous bacteria, parasites, and viruses. Dr. Felgner earned his BS, MS, and Ph.D. in Biochemistry from Michigan State University and completed his postdoctoral training at the University of Virginia. He began his career at Syntex Research Institute in Palo Alto, California, where he collaborated with chemists to synthesize and characterize positively charged bilayer-forming lipids. These lipids, when combined with negatively charged nucleic acid, form structures he termed 'Lipoplexes.' The process, known as 'Lipofection,' is now the most widely used in vitro transfection method among laboratory scientists. His groundbreaking work on functional gene transfer of plasmid DNA and mRNA into mouse muscle in vivo has significantly contributed to the field of nucleic acid vaccine science, notably influencing the development of COVID-19 LNP mRNA vaccines. Dr. Felgner has authored over 280 articles, garnering more than 55,000 citations, and holds more than 80 patents. He is a Fellow of the National Academy of Inventors and has been honored with prestigious awards including the Robert Koch Award for his contributions to infectious disease and vaccine science, and the Princess of Asturias Award for Technical and Scientific Research.

Abstract: The Protein Microarray Laboratory at UCI has developed a groundbreaking method to produce and print thousands of individual proteins from infectious microorganisms onto a chip the size of a postage stamp. Over the past 20 years, the laboratory has expressed 70,000 different proteins from 45 infectious viruses, bacteria, and parasites and has printed 100,000 microarrays, each containing these proteins. These microarrays are employed as a sero surveillance tool to measure antibody levels against each antigen in the blood and to monitor exposure levels of the infectious microorganisms in human and animal populations globally. The sentinel role of serosurveillance is vital, as it enables public health officials to respond to potential outbreaks or health risks before they become widespread. By monitoring populations, this method can alert authorities to the presence of pathogens in the environment, enabling proactive interventions. At the onset of the COVID-19 pandemic, the Coronavirus Antigen Microarray (COVAM) was instrumental in measuring the antibody levels induced by SARS-CoV-2 mRNA vaccines against a broad spectrum of respiratory virus antigens. This was crucial in monitoring progress toward herd immunity and demonstrating the remarkable efficacy of mRNA vaccines. This lecture will explore the construction and applications of protein microarray technology.

Register at: https://uci.zoom.us/webinar/register/WN_Ua9Yk-TuSyasbjuNAembzw