Vinod P. Balachandran

Memorial Sloan Kettering Cancer Center

Monday, October 27, 2025; 12:40 PM

Vinod Balachandran completed his undergraduate degree in Physics at Cornell University, medical degree at the State University of New York at Stony Brook, general surgery residency at Weill Cornell's New York-Presbyterian Hospital, and complex surgical oncology fellowship at Memorial Sloan Kettering Cancer Center (MSK). In 2015, he joined MSK as faculty, where he is a laboratory head in the Imuno-Oncology Program, an attending hepatopancreatobiliary surgeon, and Founding Director of The Olayan Center for Cancer Vaccines at MSK, an academic biohub focused on catalyzing next-generation precision cancer vaccines. In 2017, Vinod's group made the striking observation that exceptional survivors of pancreatic cancer have immune-activated tumors infiltrated with T cells that recognize highly immunogenic mutation-derived neoantigens. As pancreatic cancer, and most solid tumors, were presumed to lack clinically relevant neoantigens, this unexpected discovery has spurred efforts to identify, validate, and deliver immunogenic neoantigens to "therapeutically phenocopy" the exceptional survivor state. His group has spearheaded these efforts, including the landmark first clinical trial of precision mRNA neoantigen vaccines for pancreatic cancer. The promising results of this trial have galvanized his group's efforts to uncover and apply the principles of successful vaccination to extend their use in pancreatic and other similarly high-need cancers. Vinod has received several honors for his work, including the 2023 Trailblazer Prize for Clinician-Scientists from the Foundation for the NIH.

Abstract: "Personalized RNA Vaccines for Pancreatic Cancer"

Vaccines are the most successful medicines to prevent disease. Effective vaccines require discovery and delivery of immunogenic antigens to train host immune systems to target pathogens or cancer cells. Though transformative against infectious diseases, effective cancer vaccines remain elusive, given the fundamental challenges to rapidly discover and potently deliver immunogenic tumor antigens. Recent discoveries have revealed that genetic aberrations in individual cancer cells can generate vaccine-ideal immunogenic "neoantigens." Yet, as targeting neoantigens requires bespoke vaccination, these vaccines require (1) a robust strategy to identify the minority immunogenic neoantigen fraction and (2) a tractable technology to swiftly make potent vaccines for each patient. Here, I will describe our efforts to identify, validate, and therapeutically deliver immunogenic neoantigens in pancreatic cancer – a deadly cancer considered vaccine unsuited – and highlight personalized RNA neoantigen vaccination in pancreatic cancer as a framework to uncover broader scientific and clinical principles for effective cancer vaccines.