

# Damon Runyon Scientist Vinod P. Balachandran Receives 2023 FNIH Trailblazer Prize

Balachandran's work could "transform the treatment of pancreatic cancer...and provide proof of concept for future cancer vaccines."

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In 2018, the Foundation for the National Institutes of Health (FNIH) established the FNIH Trailblazer Prize for Clinician-Scientists to recognize "the outstanding contributions of early career clinician-scientists" whose research "translates basic scientific observations into new paradigm-shifting approaches for diagnosing, preventing, treating or curing disease." Nearly every year since, a Damon Runyon Clinical Investigator has won or been a finalist for the Prize: Jaehyuk Choi, MD, PhD (2018 finalist), Ami S. Bhatt, MD, PhD (2019 finalist), Piro Lito, MD, PhD (2021 winner), and Eliezer M. Van Allen, MD (2022 winner).

This year is no different. The 2023 FNIH Trailblazer Prize has been awarded to former Damon Runyon Clinical Investigator Vinod P. Balachandran, MD, at Memorial Sloan Kettering Cancer Center, whose "pioneering work has the potential to transform the treatment of pancreatic cancer, one of the deadliest malignancies, and provide proof of concept for future cancer vaccines."

In 2022, we published a [story](#) about Dr. Balachandran's leadership of the first clinical trial for an mRNA-based vaccine against pancreatic cancer. This April, in a major breakthrough for cancer research, early [results](#) from the trial showed that the vaccine triggers an effective and lasting immune response, successfully preventing relapse in some pancreatic cancer patients.

Unlike preventative vaccines, such as the flu shot, cancer vaccines are therapeutic, meaning they teach the immune system how to respond to a disease that is already present. But the underlying goal is the same: to show the immune system what the disease-causing agent looks like, so that it can produce the necessary antibodies and be prepared to fight when it encounters the real thing. Cancer cells are distinguishable from normal cells by their neoantigens—the strange-looking proteins on their surface caused by genetic mutations. Cancer vaccines isolate the patient's neoantigens and present them to their immune cells through one of several mechanisms, prompting the immune system to launch an attack against the tumor. One such mechanism, made famous by COVID-19, uses mRNA to provide the body with temporary instructions for how to make the antigen, rather than delivering the antigen directly.

Another difference between preventative vaccines and those being developed at MSK is that the latter are not one-size-fits-all but tailored to each patient's tumor. As Dr. Balachandran explains: "After the patient has their pancreatic tumor surgically removed, the tumor is genetically sequenced to look for mutations that produce the best neoantigen proteins—those that look the most foreign to the immune system. The vaccine is manufactured with mRNA specific to these proteins in that individual's tumor."

In eight out of sixteen patients enrolled in the trial, all of whom had their tumors surgically removed, this personalized vaccine activated an immune response that prevented relapse of their cancer during the 18-month course of the study. (Notably, five of the other eight patients had undergone partial or full removal of their spleen, which plays an important role in immune response.) For anyone familiar with pancreatic cancer, currently the third-leading cause of cancer-related deaths in the U.S. and on track to become the second, this is a remarkable achievement.

The next step is to conduct a larger clinical trial involving patients in multiple countries, which the team plans to launch soon.

Read the FNIH press release [here](#).

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