

UC San Diego Researchers Shortlisted for International Cancer Competition

Twelve teams reached the Cancer Grand Challenges finals, including two with UC San Diego scientists.



Ludmil Alexandrov (L) and Trey Ideker (R) are both on teams selected for the shortlist of Cancer Grand Challenges. Alexandrov leads a team investigating the origins of cancer, while Ideker is co-investigator on a team creating AI tools for cancer research. Photo credit: UC San Diego Health Sciences

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Two researchers from the University of California San Diego are among the finalists in the [Cancer Grand Challenges](#) initiative, a joint effort between Cancer Research UK and the National Cancer Institute. The international competition will award the winning teams up to £20 million to complete their projects. The winners will be announced in March 2026 at the Cancer Grand Challenges Summit in London.

Founded in 2020, Cancer Grand Challenges aims to unite world-class researchers from diverse disciplines and institutions in the fight against cancer. Earlier this year, the organization announced seven challenges in cancer research, inviting scientists from across the world to team up and develop interdisciplinary projects that address them. These challenges represent the most urgent, complex problems in cancer research that require collaboration across borders and disciplines to solve. A record 227 submissions were received this year, of which 12 have advanced to the finals.

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One UC San Diego researcher leads a finalist team decoding cancer's mutational signatures, while another is a co-investigator on a team focused on artificial intelligence (AI)-human collaborations in cancer.

Team CAUSE: Decoding Cancer's Mutational Signatures

Team CAUSE is tackling the mystery behind mutational signatures — the unique patterns of DNA damage left by environmental exposures (such as pollution, tobacco smoke, or UV rays) and natural cellular processes. These “autographs” in our DNA can help scientists trace the origins of mutations that lead to cancer, but for many signatures, their sources remain unknown.

The team aims to systematically identify and characterize DNA adducts — the chemical modifications to DNA that act as the “pen” writing these signatures. By bridging the gap between the signature and its source, the team hopes to provide actionable insights for cancer prevention and treatment, potentially transforming our understanding of how cancer starts.

Led by Ludmil Alexandrov, Ph.D., professor of cellular and molecular medicine and bioengineering at UC San Diego, the team brings together experts from the U.S., the Netherlands, and the UK, working collaboratively to reveal the hidden causes of cancer and develop strategies for intervention.

“The Cancer Grand Challenges framework has inspired us to think much more boldly and creatively,” said Alexandrov. “By posing problems that are considered intractable, it forces us to break out of traditional approaches and integrate chemistry, genomics, AI, and patient advocacy in ways that none of us would have attempted alone.”

Team Biologia Ex Machina: AI-Human Collaborations in Cancer

Team Biologia Ex Machina is developing the next generation of AI-powered “co-scientists” to revolutionize cancer research. With so much scientific information available, it's becoming less and less possible for human researchers to process and synthesize it alone. The team's AI systems will work in partnership with human scientists to rapidly generate, refine, and experimentally validate thousands of hypotheses at scale.

This approach could dramatically accelerate the discovery of new therapeutic targets across many tumor types, overcoming limitations of conventional research methods. The team's ultimate goal is to speed up the translation of these discoveries into clinical treatments, benefiting patients worldwide.

Trey Ideker, Ph.D. professor of medicine, bioengineering, and computer science at UC San Diego, is a co-investigator on team Biologia Ex Machina, joining colleagues from the USA, Spain, Switzerland, and the UK.

“Harnessing the combined strengths of artificial intelligence and human ingenuity represents a new frontier in cancer research,” said Ideker. “Our team's goal is to accelerate discoveries that would otherwise take decades, ultimately bringing new treatments to patients faster than ever before.”