Understanding the Genesis of Cancer is Goal of $25M Award

A global team studies the underlying forces that turn cells cancerous—and hopes to learn ways to stop cancer before it even starts.

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A world-class team of researchers co-led by UC San Francisco's Allan Balmain, PhD, FRS, has been selected to receive a $25 million Cancer Grand Challenges award to investigate the very early stages of cancer development. Cancer Grand Challenges is a global funding platform, co-founded by Cancer Research UK (CRUK) and the National Cancer Institute (NCI) in the U.S., that supports a community of diverse, global teams in taking on some of cancer's toughest challenges.

Balmain, with Kim Rhoads, MD, MS, MPH, and Luke Gilbert, PhD, both of University of California, San Francisco will lead the team, called PROMINENT (PROMotion to INform prevENTion) alongside Paul Brennan, PhD, from the International Agency for Research on Cancer and Nuria Lopez-Bigas, PhD, Institute for Research in Biomedicine Barcelona, in seeking answers to fundamental questions about the very early stages of tumor development.

"As a research community, we're on the verge of a major leap forward in our understanding of the factors that contribute to the risk of cancer, which could help to find new, informed ways to stop cancer before it even starts," said Balmain, a professor in cancer genetics at UCSF and an acclaimed scientist at UCSF's Helen Diller Family Comprehensive Cancer Center (HDFCCC).

This global grant follows in the footsteps of a 2017 Cancer Grand Challenges award to Balmain and other investigators, called "Mutographs of Cancer," to research unknown causes of cancer to help prevent more people from developing the disease.

On the new project, the researchers will build on recent findings that suggest cells can remain seemingly "normal" despite carrying many cancer-causing mutations in their DNA, aiming to develop a picture of underlying forces that keep cells healthy or turn them cancerous.

"This investment in team science encourages diverse thinking to problems that have long hindered research progress," said David Scott, PhD, Director of Cancer Grand Challenges, Cancer Research UK (CRUK). "Cancer Grand Challenges provides the multidisciplinary teams the time, space and funding to foster innovation and a transformative approach."

The PROMINENT team unites advocates and scientists with expertise in epidemiology, genetics, imaging and more, across 5 institutions in the U.S., U.K., Sweden, Spain and France. UCSF is a natural participant in such multidisciplinary pursuits, said Gilbert, an assistant professor in urology at UCSF who leads an effort to map genetic interactions in the nuclei of human cells.

“We’re really excited to be part of this multifaceted group investigating the most foundational questions about cancer,” said Gilbert, a member of the HDFCCC. “These kinds of collaborative efforts to tackle grand challenges in cancer biology are at the heart of science at UCSF and we hope our team’s effort will transform our understanding of these very complex problems.”

Cancer research is most valuable when it has an impact on real people’s lives, said Rhoads, associate professor of epidemiology and biostatistics at UCSF and associate director for community engagement at the HDFCCC.

“Cancer prevention is relevant to everyone,” Rhoads said. “So, I am pleased that NCI and CRUK have prioritized the translation and dissemination of research findings for lay audiences. Partnership with cancer advocates Gerald Green, a member of the HDFCCC Men’s Health Committee, and Dale O’Brien, executive director of the Cancer Patients Alliance in Monterey, California, will help us maximize the impact of our findings.”

UCSF has received three of the prestigious Cancer Grand Challenges awards in the last half dozen years. Along with the new grant and Balmain’s previous Mutographs award, Thea Tlsty, PhD, received one of the awards in 2019 to study the role of inflammation in causing cancer.

“This recognition embodies UCSF’s dedication to changing the outlook on cancer, something we’ve been making progress in for decades through collaborative science that brings together the breadth of talent and vision from across our institution and beyond,” said Alan Ashworth, PhD, FRS, president of the HDFCCC and senior vice president for cancer services with UCSF Health.

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