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For Immediate Release

Cancer researcher Miguel Reina-Campos awarded $1.3 million from W. M. Keck Foundation

LJI lab looks to "boost" cancer-fighting T cells

LA JOLLA, CA—La Jolla Institute for Immunology (LJI) Assistant Professor Miguel Reina-Campos, Ph.D., has been granted $1.3 million from the W. M. Keck Foundation to support new cancer research.

Reina-Campos leads research into how we might use the body's own T cells to fight tumors. With the new Keck Foundation funding, Reina-Campos will investigate how we might give T cells a boost using energy stored up in a cell's "epigenome."

"This is incredibly innovative work. No one has tried this before," says LJI President & CEO Erica Ollmann Saphire, Ph.D., MBA. "Miguel's work will show us how to harness a hidden energy source inside T cells to fuel their fight against cancer. This research holds enormous potential to transform the field of cancer immunotherapy."

The epigenome is a powerful player in our cells, including our immune cells. The epigenome is a vast collection of chemicals that attach to our genetic code (The name epigenome boils down to "on top of the genome"). These chemical "ornaments" are important because they control how our cells read our genes to produce proteins. "However, not all of the epigenome might necessarily be involved with gene regulation," says Reina-Campos.

This research has led Reina-Campos to a fascinating possibility. "What if cells use their epigenome as a metabolic reservoir?" says Reina-Campos.

Reina-Campos is wondering if T cells could utilize their own epigenome as a metabolic-depot to fuel their functions. Reina-Campos's idea is based on the fact that these same chemical ornaments can power important metabolic processes inside of a cell. "Establishing this novel biological concept could transform how we think about the epigenome and its connection to metabolism" says Reina-Campos.

If T cells are tapping into the epigenome—that raises another interesting question. "What if we could leverage the epigenome to power cellular metabolism in situations where T cells need it?" says Reina-Campos. Tumors are hard to kill, so cancer-fighting T cells are especially desperate for fuel. Reina-Campos thinks the epigenome might also help T cells fight tumors and this can be engineered into cellular immunotherapies.

For the new study, Reina-Campos will collaborate with colleagues in LJI's Center for Cancer Immunotherapy, including LJI Associate Professor Ferhat Ay, Ph.D., who uses computational and statistical modeling to understand the genetic and epigenetic bases of gene regulation.

"This collaboration was instrumental in us getting this award," says Reina-Campos. "We are proposing to tweak the epigenome, which is a very complicated, complex machinery."

About La Jolla Institute

The La Jolla Institute for Immunology is dedicated to understanding the intricacies and power of the immune system so that we may apply that knowledge to promote human health and prevent a wide range of diseases. Since its founding in 1988 as an independent, nonprofit research organization, the Institute has made numerous advances leading toward its goal: life without disease. Visit lji.org for more information.

About the W. M. Keck Foundation

The W. M. Keck Foundation was established in 1954 in Los Angeles by William Myron Keck, founder of The Superior Oil Company. One of the nation's largest philanthropic organizations, the W. M. Keck Foundation supports outstanding science, engineering and medical research. The Foundation also supports undergraduate education and maintains a program within Southern California to support arts and culture, education, health and community service projects.

The W. M. Keck Foundation's support of Southern California-based organizations enriches the lives of the region's residents and has expanded and deepened over the years. Programming for children, youth, and their families is supported with the goal of providing safe, healthy, supportive environments that prepare children to succeed in school and in life.

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