



From left to right: PhD student Rachel Brog and Yina Huang, PhD, explain their work to donors Tom and Susan Stepp.

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## FUNDING RESEARCH IN THE FIGHT AGAINST CANCER

**T**OM STEPP WAS THE PICTURE OF HEALTH. Three years shy of his seventieth birthday, Tom didn’t take any medications, had suffered no serious illness, and spent his free time skiing, kayaking, and hiking New England’s 4,000-foot mountains with his wife, Susan. So it came as a shock when Tom was diagnosed with stage II melanoma of the earlobe. The news that the cancer had advanced deeper than the first layer of skin made the situation, Tom says, “scary and surreal.” But Susan, who’d trained as a nurse at Columbia-Presbyterian and understood the incredible value of an academic medical center, had often told Tom how lucky they were to have Dartmouth-Hitchcock (D-H) nearby should they ever need major medical care.

It has now been two years since D-H surgeon Christina Angeles, MD, excised the cancer from Tom’s earlobe, and he is thrilled to report that he’s had no recurrences. Grateful for the excellent care he received at D-H—from Dr. Angeles to the dermatologists to the support staff—Tom and Susan wanted to give back. They reached out to their friend Paul Guyre, PhD, emeritus professor of microbiology and immunology at Geisel, and asked him about research projects that could use funding. Tom explains, “We’re strong believers in science, and it needs support—especially in today’s climate.”

Guyre told the Stepps about the work of Yina Huang, PhD, associate professor of microbiology and immunology and of pathology and laboratory medicine

at Geisel, and it was “just the kind of situation we’d like to support,” says Tom. Huang’s expertise is in T cells, and her research is focused on improving cancer treatment. She currently mentors four PhD students and one MD-PhD student, all of whom are working on topics associated with cancer immunotherapy or T cell responses. They are attempting to figure out why the immune system fails and how, Huang explains, “we can rev it up so it becomes better.”

With funding from the Stepps’ donation, Huang and second-year PhD student Rachel Brog, along with professor of microbiology and immunology Charles Sentman, PhD, are developing methods to improve the effectiveness of Chimeric Antigen Receptors, or CAR T cells. These

immune cells are engineered to specifically kill tumor cells without targeting normal cells. In collaboration with Rahul Sarpeshkar, PhD, the Thomas E. Kurtz Professor at the Thayer School of Engineering at Dartmouth, Huang and Brog are using computer simulation to engineer “smart” CAR T cells that can expand in number when there’s a tumor to attack, contract when no longer needed, and be ready to expand again to respond to a secondary tumor. The Huang lab is also testing ways to increase the cancer-killing activity of these CAR T cells and decrease potential side effects.

As Susan has known since her days in nursing school, the work being done in academic hospitals is “the key to the future” and needs to be supported. She says, “I’ve always felt you shouldn’t think of life as a free ride,” and Tom agrees, describing their decision to donate as a “no-brainer.”

“I especially liked the idea of supporting research that may otherwise not be well funded,” Tom says. “The amazing discoveries in immunotherapy offer great hope, but advancements aren’t made in a vacuum.”

LAUREN SEIDMAN