



Photos by Jon Gilbert Fox



## PROXIMITY SPARKS PROMISING THERAPIES

**An immunologist and a bone-marrow transplant physician are enhancing patients' immune cells to kill cancerous tumors.**

**A** DECADE AGO, KENNETH MEEHAN, a bone-marrow transplant physician, and Charles Sentman, an immunologist, became intrigued by a certain type of immune cell. “It turns out we were looking at the same cells,” says Meehan. “I was looking in humans; Charles was looking in mice.”

And there was another coincidence—their labs were on the same floor of the Borwell Research Building on Geisel’s Lebanon campus. “We started collaborating as soon as we learned about each other’s work,” says Meehan, whose research focuses on how to boost patients’ immune systems after a bone-marrow transplant. “We would take what he learned in mice and apply it to human cells, and vice versa.” The physical proximity of their labs was “critical” and “hugely important,” they say, to their collaboration and to the

success of their bench-to-bedside—or translational—research.

“That’s exactly the kind of fruitful partnership between clinicians and basic scientists that the Williamson Translational Research Building will generate,” says Duane Compton, senior associate dean for research at Geisel. “Drs. Meehan and Sentman had common interests, the right combination of expertise, and proximity provided the spark for interdisciplinary collaboration.”

What made this particular immune cell so interesting to Meehan and Sent-

man was a molecule located on the cell’s surface called the NKG2D receptor. These receptors bind to specific molecules—called NKG2D ligands—that are present on 90 percent of human cancer cells but rare on healthy adult cells. Increasing the number and activity of these immune cells, Meehan and Sentman hypothesized, may prove to be a powerful and safe treatment for patients with a variety of cancers. So far, their research supports that hypothesis. The team has run three clinical trials evaluating this receptor in patients with multiple myeloma, with promising results, and is looking forward to more clinical trials to further the work, if they can secure funding.

Meanwhile, Sentman is also pursuing another, related promising treatment for cancer. He’s found a way to create and attach a hybrid receptor—or chimeric antigen receptor (CAR)—to immune cells, thereby enhancing their ability to kill tumor cells and to

The collaboration between Charles Sentman (*far left*), a Geisel immunologist, and Kenneth Meehan (*left*), a Geisel professor of medicine and director of the bone-marrow transplant program at Dartmouth-Hitchcock, provides one example of the benefits of keeping clinicians and researchers in close contact. The Williamson Translational Research Building will facilitate this kind of collaboration by bringing together basic scientists and physician-scientists to share ideas and create new therapies for patients.

***“There’s a big difference between doing stuff in the lab and doing it in the clinic. They’re worlds apart.”***

recruit other immune cells to do the same. To develop this therapy, Sentman is partnering with Celdara Medical, a biotech company that helps scientists move their innovations from academia to the marketplace and, ultimately, to wide dissemination for the benefit of patients.

CAR cells are a hot topic in cancer immunotherapy. However, Meehan and Sentman believe the CAR cells devised at Geisel have a significant advantage over other CAR therapies being developed elsewhere, which typically target just one or a few types of cancers. “The molecule we’re working with is expressed in so many different kinds of tumors,” says Sentman. His CAR therapy is being tested in ovarian cancer, lymphoma, and myeloma, and has the potential to be applied to other tumors, such as breast cancer, melanoma, and osteosarcoma.

Sentman is hopeful about the future of this CAR therapy, but he knows it will take more funding—from grants, philanthropy, and venture capital—as well as clinical trials, to confirm the therapy’s safety and efficacy. So far, collaborating with Meehan and other Geisel faculty has been the easiest part.

“There’s a big difference between doing stuff in the lab and doing it in the clinic. They’re worlds apart,” says Sentman. And connecting those worlds for the benefit of patients is exactly what the Williamson Translational Research Building will do.

BY JENNIFER DURGIN



## ***At a Glance***

The new Williamson Translational Research Building will foster scientific collaboration.

Developing new and better treatments for patients demands close collaboration between scientists and physicians across many different disciplines and specialties. But getting those two groups to cross paths isn’t always easy. At the Geisel School of Medicine—where multidisciplinary collaboration is a hallmark of the culture—the new Williamson Translational Research Building will integrate basic, translational, and clinical researchers like never before. Located on Geisel’s Lebanon campus, the five-story building will also be connected to a world-class patient care facility, Dartmouth-Hitchcock Medical Center.

The Williamson Translational Research Building will be home to basic scientists and physician-researchers working in the following areas:

- Cancer
- Inflammation, infection, and immunity
- Neurosciences
- Clinical and translational pathology
- The Dartmouth Institute for Health Policy and Clinical Practice
- Computational medical sciences (including biomedical informatics, bioinformatics, and biostatistics)

The building will also be home to SYNERGY: Dartmouth’s Center for Clinical and Translational Science, which provides resources, technologies, training, and expertise to scientists focused on testing new treatments and translating discoveries made in the lab to the clinic.

While construction of the building is already underway, the Medical School is still actively engaged in fundraising to support both capital and programmatic needs. For more information, please contact Associate Dean for Advancement Mark Notestine at 603-653-0721.