

For student, pathology project soothes loss

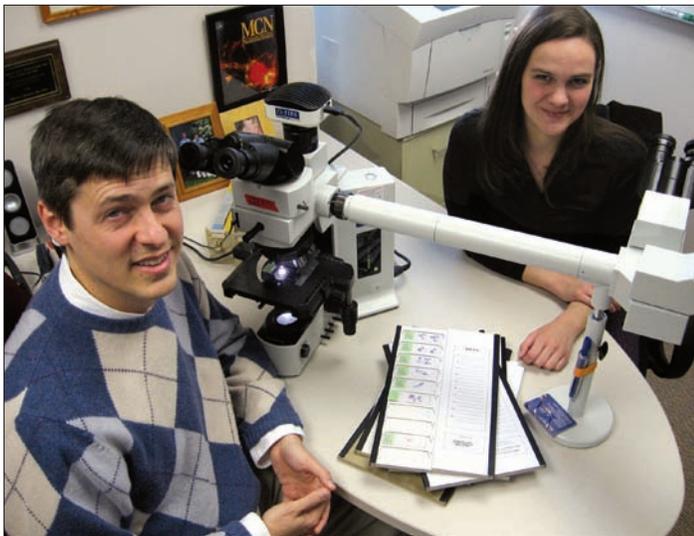
When Alissa Waite's father bumped his head on a ski lift in March 2005, he was diagnosed with a minor concussion. But about a week later, he passed out while skiing. A CT scan at the hospital revealed that his intracranial pressure was dangerously high. Rushed into surgery to relieve the pressure, he soon learned what was causing his symptoms—three brain tumors called glioblastomas. Patients with glioblastoma multiforme (GBM) usually live between 12 and 15 months. Waite's father died in February 2006, less than a year after his diagnosis.

Today, Waite, a second-year Dartmouth medical student, is able to talk comfortably about her father's death and the cancer that killed him, in part because of a research project she's been working on with Dr. Brent Harris, a DHMC neuropathologist.

The project, supported by the Andy Fund, involves looking at the correlation between various characteristics of GBM cells and a patient's prognosis. Harris and his collaborators—Drs. Camilo Fadul, a neuro-oncologist, and Gregory Tsongalis, a molecular pathologist—are interested in an enzyme that makes some chemotherapy drugs less effective.

Benefit: Throughout her father's illness, Waite says, she often felt "helpless." So when the opportunity arose to conduct research that might benefit future GBM patients, "I needed to jump on that," she says.

Waite spent last summer reviewing clinical histories and tracking down more than 100 tumor samples from GBM patients who had been treated at DHMC in the past five years. The samples will be used to create a tissue microarray—a small wax block



Alissa Waite's father died of a brain tumor in February 2006. Since then, with neuropathologist Brent Harris, she's been studying the kind of tumor her father had.



In this mid-1970s aerial view of the DMS campus, Strassenburgh Hall—originally built as a dormitory—is the low building on the far right.

Doggone it: Downside to building's demise

Its hallways are less than 36 inches wide, its lighting is dreary, and its carpets are dingy. Strassenburgh Hall—built as a medical-student dormitory in 1962 and for many decades now an office building—is one of three structures on the DMS campus scheduled for demolition or removal in a few months. (Butler, just west of Strassenburgh, and the modular building often called the "Pizza Hut," on the DMS lawn, are the other two.) In their place will eventually be a new Dartmouth College life sciences building.

One might expect the faculty and staff who have had offices in Strassenburgh to be thrilled at the prospect of moving to newer, more spacious, modern offices. But for some, leaving the quirky space will be bittersweet.

"I, for one, will be sad to leave Strassenburgh," says Denise Smith, a budget assistant who's been working in the building for five years. The narrow hallways, she explains, "make people talk to each other face to face, even if it's [just] 'Hi.'" Most of all, she'll miss bringing her 130-pound Saint Bernard to work. And Hemi, as he's named (after the Daimler-Chrysler engine), will no doubt miss playing with the half-dozen or so other dogs who regularly join their owners at work in dog-friendly Strassenburgh. Among them are a yellow lab, a black lab, a Brittany spaniel, a cockapoo, and a Bernese mountain dog.

"The new office space is much nicer," says Marion "Mimi" Simpson, a DMS instructor who also works in Strassenburgh, "but there are always tradeoffs." And the biggest tradeoff for many, as Strassenburgh bites the dust, may be the fact that they'll need to leave their furry companions at home. J.D.



HOT STUFF: When the President's Cancer Panel visited Kentucky, DMS's Dr. James Sargent was invited to present his research on movie smoking's effects on children. A local paper called it "one of the most interesting presentations."

that can hold several hundred tiny tissue cores. The microarray can then be cut into slides, each of which will contain hundreds of different tumor samples.

Microarrays "are an efficient and cost-effective method" for analyzing a lot of tissue samples simultaneously, Harris explains.

"We'll use a few of those slides—a few slices off the top of the block," Waite says, "then the block will be here as a resource" for other scientists who wish to collaborate with Harris's group or to conduct their own analyses.

Harris's GBM project is having another, rather unexpected benefit—not for other scientists but for Waite. Working on the GBM research has been "very therapeutic for me," says Waite, "to feel like I'm doing something to maybe make [things] different for the next family" facing a GBM diagnosis. "Plus it's been great to get to know the faculty at the hospital a little bit better," she adds, "and to see how the hospital works." Harris invited Waite to shadow him so she could get a sense of what a neuropathologist does, and he's helping her stay involved with the research project, even as she manages a full class load.

Lab: Dartmouth has "a lot of mechanisms" that allow medical students to do research, says Harris. As an M.D.-Ph.D., he sees great value in medical students spending time in the lab.

Waite does not plan to pursue an M.D.-Ph.D., but she hopes to always keep a foot in research. "Medicine gives you an opportunity to [do] that," she says.

JENNIFER DURGIN

Playing around with proteomics

There's a new kid on the block over at Dartmouth's Norris Cotton Cancer Center, and he's willing to share his high-tech "toys." Dr. Scott Gerber, a proteomics expert who until recently was at Harvard, has a couple of state-of-the-art mass spectrometers that analyze proteins faster than a speeding bullet. And he's happy to let other Dartmouth scientists use them, too.

Cells: Proteomics, the newest frontier in cancer research, is the study of proteins and their function. Genes are the blueprints for cells, but proteins are their workhorses, says Gerber. To understand how cells work, one needs to understand what proteins are present and how they interact with each other.

"We are interested in the large-scale analysis of proteins [to determine] how they function in a network in a connected sort of environment to affect the cellular process, whether that's gene and mismatch repair or driving a cell forward and telling a cell, 'Okay it's time to divide and to generate progeny,' and so forth," he explains.

The mass spectrometers, each about the size of a washing machine, can do high-speed analysis of complex proteins—"potentially tens of thousands of peptides in a single sample," Gerber says. The equipment has enough capacity to handle Gerber's own work as well as questions from other DMS investigators.

One of the machines belongs to the Molecular Biology and Proteomics Core Facility, which

offers services to DMS faculty who have isolated a protein but don't know what it is. "They can submit that sample to the core . . . and essentially have the protein identified," says Gerber, who is the associate director of the core facility.

Gerber's own research focuses on determining how certain proteins, when they are disrupted, drive a cell to become cancerous, as well as on developing technologies to profile human fluid samples, like plasma and serum, for biomarkers that might be early indicators of disease.

"Ultimately, our goal is to identify biomarkers, but we're approaching that problem more from a technological perspective," he says. The human proteome is so complex that "trying to find a molecule that's representative of your idiosyncratic state of health at this snapshot in time is a very, very challenging task. So we develop technology

to assist in the process." Gerber collaborates with cell biologists, immunologists, pharmacologists, bioengineers, and clinicians to help unlock cancer's secrets.

Small: It might seem surprising that Gerber is so comfortable in such a high-tech field considering he grew up in a town in Idaho so small that there were only six people in his high school class. "It was a pretty small environment, and I couldn't wait to leave it," he confesses. He majored in chemistry at Willamette University in Salem, Ore., got his Ph.D. in analytical chemistry at the University of Washington, and was a postdoctoral fellow at Harvard before coming to Dartmouth in 2006 as an assistant professor of genetics.

Now he's got the best of both worlds—big and small: DMS is big enough to offer high-tech, world-class research opportunities and small enough for the kind of collegial, collaborative relationships Gerber enjoys.

Laura Stephenson Carter



LAUREN WOOD

Proteomics expert Scott Gerber is happy to show off—and even share—his "toys," like this mass spectrometer, which can do high-speed analysis of complex proteins.