

Kurt Weiss Battles Cancer— This Time, to Help Others

As a teenager, Kurt Weiss battled and beat osteosarcoma, an aggressive bone cancer that spread to his lungs and took his leg. Now a medical student, Weiss is on a year's leave from Jefferson Medical College in Philadelphia, exploring life as a physician-scientist as he studies how osteosarcoma metastasizes and why it always migrates to the lungs.

As a member of the Research Scholars Program sponsored by HHMI and the National Institutes of Health, Weiss is conducting basic research at NIH, in the laboratory of Pediatric Oncology Branch Chief Lee Helman. He is living with his wife, Laura, and infant son, Connor, in the program's Cloister building on the NIH campus.

Using osteosarcoma cells that he has coerced into producing a green fluorescent protein, Weiss is trying to establish the route and measure the travel time of injected cells

as they move from the hind legs of mice to the lungs. In addition, he is looking to see if these glowing cells journey through the lymph nodes along the way. By and large, osteosarcoma metastases don't show up in lymph nodes, but Weiss thinks the cells probably do travel through the lymph nodes on their way to the lungs, where they often begin proliferating and may lead to death.

"Only very rarely do patients present with osteosarcoma cells in their lymph nodes," he says. "It's likely that the cancer cells do go first to the lymph nodes but are cleared by cells in the immune system. If I can establish that the osteosarcoma cells spread to nodal tissue as part of their natural biology, then I can start searching for a mechanism by which the immune system eradicates the metastasizing disease."

Weiss is interested in this as-yet-unknown mechanism because he believes it could be the basis for a new therapy aimed at halting the spreading cancer before it reaches the lungs—a major improvement on surgery and standard chemotherapy. He knows through his own experience how such research can lead to improved treatment; he is alive today as the result of an experimental immunotherapy. At age 15, when he was a lineman on his high school football team, Weiss started feeling a dull ache in his right shin. At his mother's insistence, he finally went to the doctor and learned that he had advanced osteosarcoma, which had already spread to his lungs.

A surgeon in nearby Pittsburgh removed the primary tumor and performed an allograft, transplanting a donor's bone tissue in place of some bone that also had to be removed. After Weiss started chemotherapy, however, more lung metastases appeared. "You never want the cancer to return at all," he says, "but you especially don't want it to come back when you're on chemotherapy, because that's a pretty good indication that the chemotherapy just isn't working."

It was then that his older sister, Gretchen, sent the family a small article she

discovered in *The Allentown Morning Call* about the work of Eugenie Kleinerman, a researcher at the M.D. Anderson Cancer Center in Houston. Kleinerman was attempting to use an immunostimulatory molecule called MTP-PE to enhance the ability of the macrophages in the lung to fight cancer. Weiss leaped at the chance to participate in her study. "I was very, very sick," he says. "If I was going to die, I was going to make damn sure somebody was going to learn something from it."

The treatment worked, and this past March, Weiss celebrated 11 years of being cancer-free. The intervening years weren't without setbacks—his allograft never took, for example, and ultimately he developed a severe bone infection that required amputation of a leg. "I have been through everything with this disease," Weiss says, "except death—my own death, that is. A number of friends have died from osteosarcoma. I think I can bring a unique understanding to my patients who are suffering from this disease."

His experience also has given Weiss some insight into the economics and difficulties of developing new drugs. The drug that saved his life still hasn't made it to the marketplace, in part because relatively few people develop the disease. One drug developer decided the drug wasn't economically feasible and abandoned its development. The drug now does have new financial backing but has yet to be proved effective enough for FDA approval. "This isn't an epidemiologically high-impact disease," Weiss says. "I see it as sort of a lifelong duty of mine to raise awareness of this disease and get people fired up to do the research and to fund it."

In the meantime, in conjunction with the Make-A-Wish Foundation, he has started the Kurt R. Weiss Undergraduate Scholarship—raising money to enable kids who've survived life-threatening illnesses to attend college even though their families have been burdened with high medical bills. "After fighting so hard to stay alive," Weiss says, "these young men and women deserve the opportunity to chase down their dreams."

Donations to the scholarship fund can be made to Make-A-Wish Foundation of Western Pennsylvania, Westin William Penn Hotel, Suite 417, Pittsburgh, PA 15219.

—LISA CHIU



WILLIAM K. GEIGER

Kurt Weiss is taking time off from medical school to study osteosarcoma, a cancer that nearly claimed his own life.