Myeloma Program

Guido Tricot, MD, PhD, director of the newly organized Utah Blood and Marrow Transplant and Myeloma Program at Huntsman Cancer Institute (HCI) and the University of Utah, reaches for excellence right from the start.

"My first goal is to get an internationally recognized myeloma program going," he says. "It will combine clinical and basic research—the type of research we can use to develop new treatments. To draw patients from all over the nation and the world, you need to do something unique, and the best way to do something unique is originate it from your own research in your own institution."

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Multiple myeloma is a cancer that starts and grows in the bone marrow, where blood-forming hematopoietic cells grow. Since myeloma attacks the bones, patients have bone thinning and fractures. The disease is relatively uncommon, occurring in three persons per 100,000. About 60,000 people in the United States have multiple myeloma, and 15,000 more are diagnosed yearly. Each year, 12,000 people die with this disease.

Until about 15 years ago, the median survival time for people with myeloma was 2.5 years after their diagnosis, and the median age at diagnosis was 67 years. The thinking more than a decade ago was that patients were too old and too frail to withstand high doses of chemotherapy —the standard cancer treatment of the day. In about 1990, doctors started treating myeloma patients with intensive short-term chemotherapy to kill the tumor, which also kills the healthy hematopoietic cells. This was followed by transplantation of stem cells (usually harvested from the patients' bone marrow or peripheral blood before the high-dose chemotherapy), which grew and replenished the bone marrow with healthy hematopoietic cells.

"Our hypothesis was that the patients were frail because the myeloma made them that way, not their age or other factors," says Tricot, "and getting rid of the disease in their bones, or at least getting it under control, would leave the

patients in much better shape." The hypothesis turned out to be true.

Later improvements in treatment such as a "tandem" transplant technique in which patients receive two smaller, more easily tolerated doses of chemotherapy to kill the cancer cells rather than a more toxic single dose, helped reduce the mortality rate even further. Before stem cell transplants, only five percent of myeloma patients lived 10 years beyond their diagnosis. Now 50 percent live 10 years or longer, and about 15 percent show no evidence of the disease progressing after 14 years of follow-up.

"The next step—not only to get patients in remission, not only to help them survive 10 years, but really going for the cure—needs to come from an interaction of basic science with clinical work," says Tricot. "That's why I've come to HCI. I want to work in a place where physicians interact with basic researchers, where people can cooperate and collaborate," he says.

Tricot's ongoing clinical research involves the microenvironment in the bone marrow. As myeloma cells grow, they shift the environment in the bone marrow so it favors their own growth instead of supporting normal blood-forming cells. Even after chemotherapy, the altered microenvironment allows some myeloma cells to survive. Initial studies using chemotherapy drugs that not only killed the myeloma cells but shifted the microenvironment back to normal are proving effective, especially in patients with the most deadly kinds of myeloma.

Patients from all over the world are treated in Huntsman Cancer Institute's Myeloma Program, including James Rollings from Virginia.

In patients whose myeloma recurs after treatment, the tumor cells that come back are often resistant, or less sensitive, to chemotherapy. The myeloma cells have found ways to keep the chemotherapy drug from getting inside, or they may excrete it quickly before it damages them. Tricot's research investigates immunological therapies that recognize the cancer cell from the features of its outer membrane. "We're working on immunotherapies that can tell which cells 'don't belong' to remove any populations of myeloma cells that remain after transplantation," Tricot says.

Investigating, developing, and testing these techniques will create the unique new treatments that draw myeloma patients from around the world. It's one example of HCI's philosophy of linking the laboratory to the clinic.