FIGHT TO UNDERSTAND CANCER USING MATHEMATICS

It wasn’t a typical first year at UM, says graduate student Sara Gentry. While she was studying math and biology, her father was fighting cancer.

The cancer, non-Hodgkin’s lymphoma, eventually won.

And while Gentry is quick to say she doesn’t have a vendetta against cancer, her mathematical formulas and computer simulations are working to complement scientists’ work on cancer. “By running numerical simulations on the computer, I investigate different mutation pathways that lead to the emergence of cancer stem cells,” she says. “I also look at how the cancer stem cell population affects the growth of a tumor.” Specifically, she is researching chronic myelogenous leukemia, and she hopes the mathematical model she developed will provide insight on the progression and behavior of this disease.

While it sounds like cutting-edge medical research (and studying cancer stem cells is new, even in the cancer community), Gentry is pursuing a doctorate through the Applied & Interdisciplinary Mathematics program. This program is designed to appeal to students, like Gentry, who want to pair math with science or engineering. In Gentry’s case, she took biology courses and researched cancer, but she hasn’t actually seen a cancer stem cell. Instead of working in a lab, she works on a computer with mathematical formulas that have been around for decades.

It’s this new way of applying math that excites Gentry. “I like the idea of being able to put math with biology in a meaningful way,” she says. She wants to take mathematical equations and make them relevant to current research problems, and she wants to teach others to do it too.

Teaching has been a way for Gentry to fund her graduate studies, and she loves it. “I empathize with students who do not love math but have to take it to go into business or medicine,” she says. By explaining calculus to undergraduates at UM, Gentry is able to inject her own enthusiasm for the subject, and she can help students learn how to make their own relevant discoveries.

MAKE A DIFFERENCE

Endowed Fellowship $750,000 endowed / $37,500 expendable
2008 Match: $500,000 / $25,000

To lend their minds and voices to intellectual discovery at the University of Michigan, graduate students must teach, read hundreds of pages every night, conduct research, work through rigorous peer reviews, complete
scholarly papers, and ultimately, construct a dissertation. An endowed fellowship can forever cover the cost of a graduate student’s work for each of the first four years of his or her career at UM. An expendable gift of $37,500 will provide a year’s tuition for one student.

**Fifth-Year Funding**

$500,000 endowed / $25,000 expendable

2008 Match: $334,000 / $17,000

The rigors of teaching, taking classes, and literally creating new knowledge often lead to a student’s dissertation being completed in a fifth or sixth year at the University. Since students become more narrowly focused on their research, tuition is lower – but many graduate students lose financial support after four years. Endowing a fifth-year fund will allow a student to complete an addition year of work in perpetuity, and an expendable gift of $25,000 will fund a single extra year of one student’s study.

**Summer Research Funds**

$100,000 endowed / $5,000 expendable

2008 Match: $67,000 / $3,500

Students who must conduct field research or live abroad for a summer face unique financial burdens. Many graduate researchers are forced to take out loans or spend money from their own savings if they are unable to piece together enough external grant funding to cover the costs of their inquiries. A fund endowed for $100,000 can provide excellent support to researchers in need to a student every summer, and an expendable gift of $5,000 will assist a single student for one year.

**Discretionary Support**

Through the President’s match, donors have a unique opportunity to leave an indelible mark on the support available to graduate students, the unsung heroes of an intellectually engaged campus. In a career where the smallest piece of data or the most-difficult-to-find book can make the difference in success or failure, in five years of school or six, a student’s ability to focus on writing papers, to travel abroad, or to set up research projects on demand is critical. Your support can send a student to deliver a paper to a national audience, can enable travel to archives, or can support them during the critical final two months of writing a dissertation. Make a lasting impression on the life of a graduate student and on the success of a University department through a gift to discretionary graduate student support.