UMass Boston and Dana–Farber Cancer Institute on the cutting edge of cancer research

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Time is a cancer patient’s most precious commodity. The University of Massachusetts Boston in partnership with Dana-Farber Cancer Institute developed the Center for Personalized Cancer Therapy (CPCT) with the primary objective of saving patients' time. The goal of the research conducted at the CPCT is to discover subtle differences between similar tumors. The molecular differences between tumors that otherwise appear identical will help clinicians treat tumors more quickly and effectively.

Professor of Biology and Director of the CPCT, Jill Macoska, described the current problem faced by clinicians treating cancer patients.

A patient comes in with a prostate tumor, the tumor is biopsied, examined, and given a severity grade on the Gleason scale. For instance, the tumor is graded a 7. The problem is that 70 percent of grade 7 prostate tumors respond well to initial treatment while 30 percent do not respond well. So what is the difference between an easily treated grade 7 tumor and a more aggressive grade 7 tumor? That is the question that the researchers at the CPCT are working on answering. They will look for the answer in cancer cell proteins and RNA transcripts.

There is evidence that suggests that aggressive tumors will express different proteins or use different RNA transcripts than less aggressive tumors of a similar type. Graduate and undergraduate students working with the CPCT will look for those differences using state of the art equipment. Those differences are referred to in the business as biomarkers. Once the relevant biomarkers can be reliably detected, the method of detection can be sold to cancer treatment facilities, creating a possible revenue stream for the university.

Being able to determine the severity of a tumor using relevant biomarkers will greatly improve patient care and lower health care costs in general.

“Right now, patients go through rounds of different chemotherapy, trying to figure out what is going to work for them- really just throwing darts at a board,” Macoska said. “Each new treatment costs money and takes a toll on the patient. But if you could know right away, based on the biomarkers, which course of chemo to use then you eliminate the unnecessary treatments. The patient receives more effective care and cost goes down.”

The CPCT is being funded by a $10 million dollar grant from the Massachusetts Life Sciences Center. The CPCT will be housed in the Integrated Science Complex. The equipment and lab
space used by the CPCT will be available to anyone in the UMass Boston community that may make use of it, with priority given to the CPCT.

Macoska expects students from every department of the College of Science and Mathematics to be able to contribute to the CPCT should they so choose. “Biology and Chemistry students would be interested in conducting the research, and we need people who are knowledgeable in mathematics and statistics to help interpret the data,” Macoska said.

Currently two undergraduates are working with the CPCT while earning course credit as an independent study. Graduate students may earn a stipend and research experience to bolster their resume.

Researches at the CPCT will be working closely with the Dana-Farber Cancer Institute.

“They have been instrumental in putting the center together,” Macoska said. “We intend to ask people from Dana-Farber Cancer Institute to participate on graduate student dissertation committees. When it comes to figuring out what kind of biomarkers are needed it is really going to be the clinicians at Dana-Farber Cancer Institute telling us what kinds of tumors to compare, based on their experience with their patients.”