Math Professor Posed to Make Fresh Strides in Computational Biology

By Ginger Otis

Data mining technology, which applies targeted algorithms and a deep understanding of the data to prediction patterns of future behavior—and helps predict where a person will go next based on their messages to voters and grocery stores decide which items to stock—may also lead to breakthroughs in cancer research, in the view of associated with a multi-disciplined mathematics Chris Wiggins.

Wiggins is part of a multi-disciplinary team that recently received a five-year, $18.5 million grant from the National Institutes of Health to establish a National Center for Biomedical Computing, to be known as the National Center for Multi-Scale Analysis of Gene-Tissue Networks (MAGNet).

"The goal of the National Center is to provide tools and methods that are used to build predictive models for how changes in these networks impact clinical outcomes," says MAGNet director Andrea Califano, professor of biomedical informatics. "We seek to integrate high-risk genetic information with clinical data, to create personalized medicine."

"We have the technology and methodology to do this," Califano says. "The challenge for people who are trained in the natural sciences is to make those models that are not only predictive but also explainable. Because most biologists don't care how well you can predict how a particular gene goes up or down. They want to know why."

"Genomic information is not enough on its own," says Wiggins. "We also need to include environmental and lifestyle factors that might influence the way the genome is expressed."

"One of the main goals of MAGNet is to provide a framework for developing personalized medicine," says Califano. "We're trying to build a platform that can be used by researchers around the world to develop new therapies and treatments for cancer."

"The National Center is an exciting opportunity for us to collaborate with other researchers in the field," says Califano. "It will help us to develop new tools and methods for analyzing and understanding complex biological systems."

"The collaboration between MAGNet and the University of California, Berkeley, is a great example of how we can work together to achieve our goals," says Califano. "We're excited to start this new program and to see where it takes us."