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## Inside Biotech

# Bioinformatics takes lead role in building biotech startups

By Lucy Caldwell-Stair, Special to Mass High Tech

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When researchers at Sirtris Pharmaceuticals in Cambridge needed to know, two years ago, whether their potential drug traveled the same pathway as a similar protein found in nature, they employed a new computer method that quickly confirmed that the proteins were indeed similar. The results gave them the green light to proceed with development.

The causal modeling platform that Sirtris, now a GSK company, used belongs to Genstruct Inc., a systems biology firm located in Cambridge. Such bioinformatics platforms promise to speed drug delivery, better predict toxic effects, make drugs for patient subpopulations, find biomarkers for diagnostics and speed patent research.

Small biotechs and startups such as Sirtris have just as much incentive to use these high-powered tools as do large pharmaceutical firms.

"In many ways, it's more appropriate for startups because they tend to explore novel and unique spaces, and more foundation work is needed," said Keith Elliston, CEO of Genstruct.

Elliston said that to develop a drug for Alzheimer's disease, for example, researchers must understand how genes associated with a disease influence other genes and proteins in a network of thousands of interactions that take place over time. "The traditional way is to do

hundreds of different experiments, compared to one experiment with our modeling," he said.

A researcher first gathers small-scale experimental data and forms a rough hypothesis of the chain of events that leads to a healthy — or disease-causing — cellular pathway. Genstruct's models evaluate the data using built-in, known cause-effect relationships culled from primary scientific articles. The result is a reconstruction of the pathway, which becomes a more exact hypothesis for the researcher's follow-up lab experiments.

Privately held Genstruct has done more than 50 engagements and was profitable last year, said Elliston. A new collaboration with genomics company Gene Logic Inc., based in Maryland, applies the model to predicting toxicity.

GenomeQuest Inc. in Westborough specializes in making sense of the mountains of genetic sequencing data that researchers produce these days.

"There's been a 10,000-fold increase in the last three years in the volume of data generated per instrument," said GenomeQuest CEO Ron Ranauro. "Now we can interrogate every DNA molecule against all known knowledge bases, when before only a fraction could be sequenced," he said.

First, partner company 454 Life Sciences in Branford, Conn., sequences the raw samples sent in from research labs. Then GenomeQuest annotates them quickly and accurately, which "increases the quality of science and gives new ideas for new biology," Ranauro said.

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Entrepreneur and MIT blackjack guy Semyon Dukach talks to the AFP about Global Cycle Solutions, the MIT\$100K finalist and development-track winner that developed a bicycle-powered corn-sheller for use in developing countries. Dukach told MHT in January that he was looking for a nonprofit to join to help others as he worked on StartupHive.org. You'll have to click here to watch the AFP's ...

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