

## Tumor genes: Cancer Signaling Map Offers New Approach

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**Genizon BioSciences closed a** financing round worth \$31 million, which the company says will be used to support genome-wide association studies in obesity, type 2 diabetes, dyslipidemia, and hypertension. The funding round, led by venture capital fund BTF, brings the company's total financing to more than \$130 million since its inception in 1999.

#### **Scientists at the European**

Molecular Biology Laboratory published a paper in *Nature* showing a new technique called cryo-electron tomography to visualize proteins at sufficiently high resolution to see specific cell interactions.

#### **David Smith is the new vice**

president of operations for synthetic bio firm Codon Devices. Smith's background lies in manufacturing, technology transfer, R&D, and quality control.

#### **Blood supplier Héma-Québec**

announced the creation of a database of 22,000 donors genotyped for several blood groups to help facilitate transfusions for patients in Québec. The agency worked with Génome Québec in developing the genotyping process.

#### **GATC Biotech joined the**

consumer genomics market with a new subsidiary called LifeCode, which plans to offer DNA sequencing and analysis services to customers in April.

**W**hen it comes to cancer genomics, navigating the long road from the bench to bedside may now be a little easier thanks to a new map of human cancer signaling. Edwin Wang, a bioinformatics researcher with the Biotechnology Research Institute of the National Research Council of Canada, and his team have recently released a map that aims to provide a framework for the most prominent signaling cascades used by major cancer cells types.

According to Wang, scientists have until recently regarded these chemical pathways as linear, but he believes that cancer signaling pathways look more like a series of intersecting pathways, much like a city block. "Traditionally, scien-

**"We do not think these chemical pathways are linear, because there are studies showing a lot of cross talk between the pathways."**

tists think of signaling or metabolic pathways [as] linear," says Wang. "We do not think these chemical pathways are linear, because there are studies showing a lot of cross talk between the pathways. So now people have begun to think in terms of a system biology point of view."

The cancer map is made up of nearly 300 proteins and roughly 900 signaling relationships among their respective genes. In order to construct such a map, the researchers had to manually construct a net-

work diagram of human cellular signaling that encapsulated the accumulated cellular signaling knowledge collected during the last 60 years. The nodes in the network



**EDWIN WANG**

were then annotated based on a list of a few hundred cancer-related genes identified by large-scale sequencing of tumor genomes. "Our model shows that even though these genes are complex in their permutations, they really just have a few modules involved," Wang says. "This means that they have rules behind them, the so-called logic of cancer signaling."

Wang says the researchers have already begun to learn from their map of network connections. "If you examine the data of the current occurrence of cancer types in the world, actually lung and breast cancer are the top two types that occur," he says. "One

message we get from the map is that these cancers have correlations of multiple combinations of signaling cascades to the very high rate of these cancers." He hopes that large-scale sequencing will continue to enrich the map so that in the future researchers will be able to identify targets using available drugs.

— Matthew Dublin