

Funding key to growth of scientific innovations

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Scuba divers harvesting the ocean floor for the next pharmaceutical breakthrough. Specially crafted molecules that guide surgeons to cancerous growths. Medical researchers studying sites such as Facebook to find early-warning signs of epidemics.

Those were among the ideas that were discussed at the La Jolla Research & Innovation Summit last week, as a dozen scientists from some of the area's top research centers unveiled their latest projects before more than 100 potential investors.

Even though most of the ideas are still in the earliest stages of development, economists say they are emblematic of the type of innovative technologies that could help lead San Diego County out of recession and position it for future growth -if they get the monetary backing to take them from the drawing board into full production.

And that's getting harder these days. "If you have something really good, you can still find money from investors, but it's not like the late '90s, when people were investing in everything under the sun," said Alessandro Sette of the La Jolla Institute for Allergy and Immunology. "Now they want to invest in less-risky areas and in the things that show the greatest amount of promise. That makes sense but also means that some very good ideas might not get funding."

The ideas that were floated at the summit included a wide variety of potential technological advances: · Day-glo cancers. UCSD professor Roger Tsien, who won the Nobel Prize for chemistry in 2008, is working on developing molecules that would be attracted to secretions emitted by cancers and tumors within the body. Once the molecules glom onto the cancer cells, they would emit a fluorescent light to help surgeons see where to make incisions.

· Medicines from the sea. At UCSD's Center for Marine Biotechnology and Biomedicine, William Gerwick is studying oceanic algae for its potential in fighting cancer, inflammation or bacteria. "This algae, which is sort of like pond scum, is rich with treasure troves of unusual organic structures," he said. And because he only expects to use 30 percent to 40 percent the algae he collects, the rest could be used for biofuel, he said.

· Cheaper solar power. Rooftop solar panels now use mechanical tracking devices to follow the sun as it crosses the sky. The devices are needed to keep a steady flow of sunlight on the panel, but they also make the panels heavier, more expensive and harder to maintain. UCSD engineering professor Joseph Ford proposes replacing them with tiny lenses embedded in the panel that could track the sunlight even when the panels are lying flat on the roof.

· Delivery chips. The Center of Nanotechnology for the Treatment, Understanding and Monitoring of Cancer is working on several

projects using microchips in the fight against cancer, including the creation of tiny pharmaceutical-laden chips that would pilot through a patient's body and deposit medicine in the place where it is most needed.

· Data-mining social networks.

UCSD political scientist James Fowler has been developing statistical analyses of Facebook friends and other social networks to track such things as the spread of diseases or the effect of peer pressure on obesity. Fowler's book "Connected," about how social networks are shaping our lives, was recently named as one of the best books of 2009 by BusinessWeek.

Over the past couple of decades, ideas such as these have often formed the basis for startup companies, which initially get their funding from federal grants, loans from friends and family and "angel" investments from wealthy individuals. Once the company is on its feet, venture capital firms step in with the hope of making a profit once the company either gets listed on the stock market or gets sold to a bigger competitor.

But during the Great Recession, such investment funding has shriveled. A recent report by PricewaterhouseCoopers shows that since peaking in 2007, venture capital investments in the life sciences fell 14 percent in 2008 and 22 percent in 2009. During the first quarter of last year, there were only \$1.1 billion in investments nationwide, compared with more than \$2.5 billion in early 2007. Venture capitalists have gradually re-entered the market, with investments growing to \$1.7 billion in the fourth quarter. But that only brought it to the same level of funding as in the fourth quarter of 2008 and some market participants say that could be part of a long-term trend, which will require alternate ways of funding innovative startups.

"The consensus is that we'll be seeing some underperforming venture funds going under this year and next," said Peter Townshend, partner with San Diego's McDermott Will & Emery law firm, who helps startups through the funding process. "But if the economy doesn't improve, you could see pension funds, which are the biggest backers of venture capital, decide that they're not worth the risk, and that would be a true catastrophe for the venture market."

Richard Sudek, who chairs Tech Coast Angels, a network of angel investors based in Irvine, said that even if such a catastrophic event doesn't occur, most venture capital firms seem like they are pulling in the reins: investing lower amounts of money, expecting lower amounts of risk and looking for earlier exit points on their investments.

"They seem to be going back to the way venture capital firms traditionally were, before the dotcom bubble burst," he said.

Duane Roth, chief executive of San Diego's Connect, an association that specializes in supporting local technology firms, said it may be time for a radical remake of the old model, which was based on a company taking a single idea to investors and hoping to get enough money to roll out its products.

In a white paper in January, Roth proposed a new model for financing: Have teams of scientists -such as those at last week's summit -go into the market with a portfolio of several ideas, some of which may be doomed to failure, while others may hit home runs. Under his plan, angel investors would finance the earliest phase of development and then potential buyers -such as the big pharmaceutical companies -would step in to work in partnership with the scientific teams to develop the most promising technologies.

Not everyone buys into Roth's ideas. Townshend, for instance, says that having giants like the big pharmaceuticals step into the funding process wouldn't work in other fields, like telecom or software. And many entrepreneurs cling to the notion of developing their own products instead of standing by as a conglomerate takes over.

But it seems clear that unless the venture capital market revives, scientists are going to have to be as creative about finding financing for their projects as they are about finding new uses for microchips, molecules and algae. Dean Calbreath: (619) 293-1891; dean.calbreath@uniontrib.com

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