

Turning technology into gold

Scientists need help to make their entrepreneurial dreams come true. Jonathan Knight talks to the experts.

There are probably few scientists who have never had an entrepreneurial thought. Many researchers, at least fleetingly, have considered what it would be like to stumble across something with a real-world application and to see it move to a commercial setting.

In San Diego, as in other technology centres, discoveries flow from the laboratory bench to the marketplace with the help of specialists in technology transfer. "We are like venture capitalists, only we deal in patents," explains Alan Paau, who heads the technology-transfer office at the University of California, San Diego (UCSD).

Through licensing and other intellectual-property deals, Paau's office has created 120 start-up companies in San Diego in the past decade. These firms, combined with numerous ventures started by the other major research centres in the region, have helped to transform the town into today's high-tech hub, Paau says.

So how does technology transfer help San Diego? After all, just because a technology is invented in San Diego, it doesn't mean that it will be licensed to a San Diego firm. The top bidder for the invention could just as easily be based in Boston or Hong Kong.

Several factors keep the technology local. One is that the inventor is more readily available for consultation if companies are located close to the technology's birthplace. Another is the practice at UCSD of giving preference to local companies, even if this means forgoing a

What is it worth?					
Institution	Licensing revenue, 2001 (\$ million)	Per cent of all funding, 2001*	US patent applications filed, 2001	2001 patents issued	2001 licences/options executed†
Univ. California, San Diego	5.4	0.1	178	59	48
Salk Inst.	3.0	3.0	49	20	16
San Diego State Univ.	0.05	0.1	7	2	4
Scripps Inst.	N/A	N/A	N/A	N/A	N/A
Burnham Inst.	N/A	N/A	N/A	N/A	N/A
Harvard Univ.	19.1	3.7	193	37	95
Univ. California, Los Angeles	8.3	1.6	127	37	17
Univ. California, San Francisco	29.2	5.2	153	80	62
Univ. Michigan	7.9	1.2	128	65	64
Columbia Univ.	129.9	35.2	173	62	67
Univ. Washington	25.0	3.8	110	49	101

Source: Association of University Technology Managers. *Percentage of all research funding made by licensing revenue; †Number of licensing deals, including options to license, completed. N/A, not available.

higher bid for a licence. "As a state-run institution, we have a responsibility to focus locally," says Paau. There are also a number of organizations, such as UCSD CONNECT, keen to help start-up firms find their feet.

Before the licensing stage, someone has to decide whether the invention is worth patenting. This is where technology-transfer offices come in. Sangeeta Bhatia, a tissue engineer at UCSD who has invented a number of patented technologies, says these offices are indispensable. "Without their services, most of our biomedical innovations would be worthless," she says.

Many discoveries do not have market potential, although a researcher may find this difficult to accept. "Faculty members are in no position to judge the commercial viability of their invention," says Arnold LaGuardia, executive vice-president of the Scripps Research Institute. It is up to the licensing officer at the tech-transfer office to take a sober look at the invention and make the call.

Some research centres, such as the Salk Institute for Biological Studies, require their faculty members to report inventions to the technology-transfer office. The Scripps Research Institute goes further, reviewing every manuscript for potentially patentable discoveries before it is submitted to a journal.

More often than not, the answer from the licensing officer is no. In the fiscal year ending June 2002, the latest period for which figures are available, 255 inventions were reported to the technology-transfer office at UCSD, but only 112 patent applications were filed. One of the reasons for deciding not to patent is that a similar patent already exists. More frequently, however, it is because the licensing officer does not see any viable market for the technology.

One approach to applying for a patent is to find a company that is willing to pay the cost of filing, which usually adds up to \$25,000 for a US patent and up to ten times as much for a foreign patent. In exchange, the company gets an option to license the technology. In this model, the institution's costs are covered, and there is no reason not to patent even if a real market never materializes.

Basic research seldom leads to inventions that are obvious money-makers. Yet many early-stage innovations hold a great deal of promise for the future. "The things that will be big in the next few years were patented ten years ago," says Polly Murphy, head of technology management at the Salk Institute.

So everyone must do a certain amount of 'at-risk' filing, which means applying for a patent without a licensor. Murphy estimates

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that about 40% of Salk's existing patents and patent applications are done this way, a fairly typical percentage for research institutions. John Campbell, director of intellectual property at the Burnham Institute in La Jolla agrees. "We are willing to

file a patent application and then wait until the market catches up," he says.

Usually, the patents that pay off make up for those that never find a market. For example, the Salk's patent on a research tool for inserting foreign genes into experimental organisms, filed in the mid-1990s before there was any commercial interest, has become a major revenue generator, although the institute would not say the actual amount.

Without good technology transfer, San Diego might never have seen a tech boom. As it turned out, for the scientist with an entrepreneurial bent, it's home-sweet-home. ■

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