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Biotech Breeding Grounds

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Investment capital and proximity to talent are key ingredients to raise a herd of world-class biotechs. In the race for the next biotech hub, developed countries don't always have all the advantages.

The biotech start-up is a highly prized commodity. Economic development organizations, trade groups, and governments around the world are trying to create environments favorable to their emergence. In the United States, nearly every state in the union is trying to cash in on the industry's success by starting the long process of growing a biotech cluster, whereas established hubs seek new avenues for growth. European countries continue down the slow path of development, partly stymied by economic fragmentation. The Asia and Pacific nations, for their part, are striving to attain critical mass.

Any biotech cluster has to have three things for success: high-quality science, a skilled workforce, and access to capital. The science typically comes from top research universities and institutions; the talent from pharmaceutical companies and entrepreneurial scientists; and capital from the surrounding business community. Economic development boards (EDBs) try to crystallize these ingredients by facilitating networking, advising would-be entrepreneurs, and lobbying for more

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favorable policy.

Biotech in the U.S.
An active government helps too. The two major US biotech hubs, in San Francisco and the Cambridge-Boston area, are the only ones to have grown "naturally," says Beh Swan Gin, director of biomedical sciences for the Singapore Economic Development Board (EDB). Government initiatives encouraged the rest, he says. In the United States, that includes San Diego, the third big hub, and smaller clusters in Raleigh, Seattle, Maryland, and the New Jersey-Philadelphia corridor. To states hoping to jump on the bandwagon now, "I would say get started 20 years ago," says Barry Teater, director of corporate communications for the North Carolina Biotechnology Center. "This is not a quick industry to grow."

Nevertheless, the list of hopefuls has considerably lengthened recently. In 2001, some 14 US states enacted strategies for growing their life sciences industry, according to a 2004 report from the Biotechnology Industry Organization (BIO), Washington, D.C. By 2004, the number climbed to 40.

The established hubs don't intend to rest on their laurels, though. San Diego has an ever increasing need for capital, experienced management, and fresh talent, says Joseph Panetta, president and CEO of BIOCOM, the association for the life science community in Southern California. When Proposition 71, California's much publicized stem cell research initiative, passed last year, San Diego's biotech CEOs, economic development organizations, and venture capitalists all came together to make a bid for housing the headquarters of the research program. They lost to San Francisco, but the effort shows "we'll do whatever it takes to attain a goal by bringing the community together," says Panetta.

San Francisco's Bay Area has only recently seen fit to start marketing itself. It lacks the cohesion of San Diego and has taken for granted its place as the premier biotech hub, says Todd Ewing, managing director of the San Francisco Center for Economic Development.

For many years, however, the city suffered from a dearth of space around its main draw: UCSF. UCSF has spun off more than 70 biotechs, but many of them have had to get started outside the city for lack of space. The situation started to change when the university broke ground on a new campus in Mission Bay in 1999.

In 2004, Mayor Gavin Newsom's office facilitated the acquisition by Alexandria Real Estate Equities of 1.4 million square feet of laboratory and office entitlements at Mission Bay, with construction scheduled to begin this year.

Five Prime Therapeutics was the first biotech to announce it would relocate there, starting this December, followed by Colorado-based Sirna Therapeutics. The three-year-old Five Prime has its roots in UCSF and still has many connections there, says Gail Maderis,.CEO of Five Prime Therapeutics, South San Francisco, Calif. The Mission Bay facility made the move hard to pass up financially, she says. The company would share the costs of shipping, receiving, waste handling, and other support infrastructure with the building's other tenants. "Economically it makes sense," she says, as opposed to leasing a stand-alone building.

Massachusetts has also taken steps to maintain its prominence as a biotech hub. "The state is fairly aggressive in trying to foster the growth of biotechs," says Joseph Donovan, director of communications for the state's Executive Office of Economic Development. Business incentives include a 10% R&D tax credit, a 3% investment tax credit, and a manufacturing paid income tax rebate. MassDevelopment, a financing arm of the state government, provides funding for renting lab space, expanding, and purchasing equipment.

The Massachusetts Biomedical Initiatives currently hosts 15 start-up biotechs in 11 incubator labs in Worcester, Mass., says Kevin O'Sullivan, president and CEO. "We grow ‘em and push ‘em out the door," he says.

Less traditional locations can also offer advantages to a young biotechnology company. The

Kansas City area combines a low cost of living with a strong pool of talent, owing to the legacy of Marion Labs and Aventis Pharmaceuticals, says Jeffrey Southard, founder and vice president of drug evelopment for VasoGenix, Lenexa, Kan. The cost of living is half that of the coast, he says, so "investor dollars go a lot farther out here."

The individual states have plenty of room for biotechs, says Morrie Ruffin, executive vice president for capital formation and business development, BIO. "I don't believe that only a few other clusters will emerge. I think you can establish very successful companies in areas where you don't have the size and mass that you would have in some of the more established areas. It depends on what your goals and objectives are. The challenge is how do you distinguish yourself and make it convincing. That's what everybody else is doing."

Biotech in Europe

Although the United States has had a long history in nurturing the growth of biotechs, European countries have had to learn just recently how to support start-ups without hanging them out to dry. Government incentives across Europe during the late 1990s and early 2000s encouraged start-ups to grow without ensuring them enough funding to last.

Germany is the oft-cited example. Horst Domdey, CEO of Munich's biotech development organization, Bio-M, said the greater Munich area counted 30 biotechs when he joined the organization in 1997. That number soared to 105 by 2001, but dipped to 93 by the end of 2004. Expansion in the late-1990s was fueled by a generous cofinancing policy, in which venture funds up to 2.5 million Euros were matched by both the German federal bank and the Bavarian state bank. "In this environment, one can dare to start a company; perhaps too many did," says Domdey. "A lot of money got poured into good technology without a product," says Jason Rushton, an associate with venture firm Merlin Biosciences. "A lot of German companies went to the wall."

The German government and venture community learned from that experience. "In order to start a company now you need a good product in mind," says Michael Nehls, CEO of Ingenium, Munich, Germany, which was founded in 1998. He likens Germany's experience to a Darwinian process of variation and selection. "Every dollar was well spent, because you couldn't predict the successful approach." The consolidation had some positive results, he says: talent is much easier to find now compared to five years ago, and the remaining companies have absorbed the assets of those that failed.

Learning the hard way

Public money is harder to come by in parts of the United Kingdom such as Cambridge, and some put a Darwinian spin on that fact. "It's not made easy here. If you do start up here, you've done it the hard way and you know how to go on," says Jeff Solomon, CEO of the Eastern Region Biotechnology Initiative in Cambridge, which facilitates networking in the Cambridge area. Companies "have been left to get on with it, and they have," says Will West, CEO of one-year-old CellCentric, Cambridge, UK. "Only strong things have survived." As in Germany, the failures have fertilized the industry with more seasoned management, says David Chiswell, chairman of the Bioindustry Association (BIA), a London-based UK trade group.

Nationally, the United Kingdom offers some advantages over other European countries, say UK developers, including R&D tax credits. "You often get 40% to 50% of costs returned to you in tax credits," says Chiswell, who also chairs two start-ups. The government often matches angel investors, he adds, and encourages universities to commercialize their research. The country has more "flexible" employment regulations than elsewhere in Europe, says Solomon. In some countries an employer might have to pay nine months severance to lay someone off, which is an unattractive proposition to a cash-starved start-up, he says.

The Swiss government also takes a more hands-off approach to biotech development. By law the government cannot directly invest in companies, says Thomas Meier, CEO of Santhera, formed last summer by the merger of Swiss and German companies. As a result, "we learned to work with very little money in the beginning," which served them well during the contraction of funding several years ago, he says. Basel's biotech development group, BioValley, encouraged Meier to start a company in the late 1990s, after he had returned from postdoctoral research in the United States. The group gave him tips on how to proceed and offered a network of distinguished scientists, he says.

Meier chose to remain in Basel after the merger, as opposed to moving to Heidelberg, because Switzerland combines pharmaceutical expertise with a good location, he says. "I thought recruiting clinical development specialists would be easier," he says. Roche and Novartis are both headquartered in Basel. The city is also near to both France and Germany, providing access to chemists and biologist from the universities in Freiburg and Straussburg. All in all, he says, "if I would have to start another company, I would choose between Switzerland and the United Kingdom."

Another major cluster, the so-called Medicon Valley, made up by Denmark and Sweden, has reached critical mass but suffers a bit from lack of international recognition, says Stephan Christgau, chief operating officer of Osteologix, Copenhagen, Denmark. Safety and toxicology, pharmacokinetics, clinical trials, regulatory affairs and consultancy services are all within a one- or two-hour drive, he says, and the region combines good universities and hospitals with an industrial base and a tradition of collaboration.

Closing the gap

Despite Europe's active biotech clusters, some despair over the state of the industry compared to biotech in the United States. Despite having more companies than the US biotech industry, European biotech supports only half the number of employees, has half the revenues, and one-fifth the venture funding on average, according to a 2005 study by trade group Europa Bio. "I think we can't be very positive about the future," says Laurens Theunis, manager of the group's emerging enterprises council. "We have to work on a lot of things to close the gap."

Several factors make it harder for UK and European biotechs to raise as much money as their US counterparts. European investors tend to focus on shorter-term advantage, says Chiswell. US companies get more money by going public because the financial markets are much larger, he says. In the United Kingdom, when a company does go public, preemption rights for existing investors bar it from issuing more than 5% of new shares without consulting shareholders, compared to 20% in the United States.

These problems have to be addressed by individual countries and the continent as a whole, says Theunis. The European Union (EU) has established common rules for conducting clinical trials, and creates a framework for establishing other regulations, such as for intellectual property rights. But European countries still don't speak a common language or have a common market. "We're pushing hard to have a pan-European stock exchange," Chiswell says, but regional interests make that a challenging task. Europa Bio is working to get start-ups a privileged tax status and is evaluating ways to improve the financial environment, for example by optimizing the investment policy of the European Investment Fund, says Theunis.

Some see the industry as being held back by a cultural antipathy to the idea of doing business. "In Europe if you say, I want to make money, you're a bad guy," says Theunis. "I think CEOs here sometimes are too much concerned about the science and not the business. They should be willing to accept they're just like a shoe factory."

Others see disparities as evidence of Europe's late start, and dispute a significant cultural effect. "As Europeans we should oid comparing ourselves to peers in the US," says Meier, who adds that he finds investors willing to look beyond national borders. The biotech industry emerged in Europe over a decade after it did in the United States, says Christgau, and is accordingly behind. "Cultural issues may be real, but one should not make too much of that," he says. "There are entrepreneurs here; companies start up every day."

Biotech in Asia

Off to an even later start are the countries of Asia and the Pacific. Of these, Japan has the most developed biotechnology followed by Singapore, Taiwan, China, India, and Australia. In one of the most concerted efforts to grow a biotech industry, Singapore has adopted a three-pronged strategy. To grow and attract a pool of scientific talent, the government established the Agency For Science, Technology And Research (A*STAR), similar to the US NIH, which will help organize and fund biomedical research. The EDB helps local companies and develops plans and policies to attract multinational pharmaceutical companies. Bio*One, the EDB's investment arm, supplies equity capital.

Slow and steady are Singapore's watchwords, says Beh Swan Gin, director of biomedical sciences for the Singapore EDB. "We've focused on making sure companies are well positioned for long-term growth," he says. "We don't want premature companies that will starve for financing." This long-term view is one of Singapore's advantages, says Jan-Anders Karlsson, CEO of S*BIO, founded in 2000 by Bio*One and Chiron. "We have this longer-term commitment compared to venture capitalists in the US," he says. Singapore has no native biotech talent and just a small number of young biotechs, he says, but for first movers, that means easy access to the scientists that have relocated to Singapore.

None of the Asian clusters will immediately challenge the major hubs in size, but they may be able to compete regionally, says BIO's Ruffin. Some may attract companies specializing in stem cells or diseases more prevalent in the region he says. Such proximity makes clinical development more cost effective. The downside of these areas for a global company is that 40% to 50% of its market will still be in the United States, he points out, although some companies are overcoming this distance through partnerships, collaborations, and second locations. "The challenges are not insurmountable."

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