Biotechnology clusters

In the age of globalization of everything, biotechnology can not and is not being left out. The products of the biotechnology industry, namely drugs, agricultural and veterinary products, products for the chemical industry and many others, are sold worldwide. However, even though the market is global, as with all high-tech industries, biotechnology is practised essentially in three geographical clusters: North America, Europe and Japan. There are many reasons for this phenomenon, and if clusters within these regions where biotechnology flourishes are included, then some common themes emerge about the conditions that seem to be conducive towards the development and nourishment of a biotechnology company.

Today, there is nothing new about the idea of clusters and the principles that emerge by reviewing successful biotechnology clusters are no longer surprising. The reason this issue is of significant current interest is that several locations outside of the traditional clusters, including whole countries, are looking to invest in the knowledge and high-tech society of the future. They wish to do so because everybody recognizes, or should recognize, that our society is now technology driven, and that new technologies have an enormous impact on society as well as on wealth. Hence, new knowledge generation and subsequent commercialization is in everybody's interest. Consequently, cities, counties, regions and whole countries are looking at successful high-tech clusters for new ideas and recipes. And nobody more actively than the New Techno-Europe of the 5th Framework Programme of the European Union, of the Euro, of the new biotechnology patent directive, home of the largest pharmaceutical companies of the world.

So, what makes a cluster successful and what are the Europeans doing about it? The US leads the world in biotechnology success, as measured by their performance and output. The original clusters in the US that are regularly examined and analysed include Boston, San Diego, Seattle and San Francisco. In all these instances, major academic institutions are at the heart of these clusters. These areas also usually have a number of high-tech industries and a famous business school is often located nearby. Furthermore, there is a high concentration of capital in the form of venture capitalists and other types of investors who roam these areas for investment opportunities. The starting point of these clusters is often easy to see, especially in the case of the biotechnology industry, where it is possible to find out exactly when a company was established. When companies such as Amgen, Genentech, Biogen, Alza, Genzyme and others were founded, the universities, business schools and other industries were already present, and the biotechnology venture capitalists came in to support their work. The key point is that these clusters did not happen overnight and they were not planned. Other clusters were planned such as the Research Triangle Park (NC, USA), but this still took a number of years to evolve and mature to become world-famous. Ultimately, these clusters succeeded because they had access to world-class science from other major institutions nearby and because their participants persevered. This highlights another key observation concerning these clusters, namely that they did not form through design or systematic effort, but rather through years of successful development.

These two points, namely that biotechnology clusters in the US did not become successful overnight, and that they have emerged through perseverance rather than through original planning, need to be taken into account when considering the artificial, concerted efforts to emulate similar clusters elsewhere, especially in Europe. Of course, there are numerous efforts under way in both North America and Europe to create new clusters in other places that are not necessarily blessed with all the ingredients that characterized the original US clusters and to spread the excitement and return that biotechnology can bring.

Europe, for many reasons beyond the scope of this Editorial, did not produce the same success in corporate biotechnology as the US, even though some of the same ingredients were present, such as the leading academic institutions.

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 1359-6446/99/$ – see front matter PII: S1359-6446(99)01368-9

However, Europe is currently catching up with the US and one area in which the Europeans are very active is in the establishment of biotechnology clusters. This is mostly seen as a national affair, with the European Union providing extensive financial support for transnational efforts. At a national level, the UK, Germany, Ireland and France may be seen as leaders in establishing a variety of biotechnology support and cluster-oriented schemes. These schemes aim to provide initial funds for entrepreneurs, to establish links with universities, to educate scientists about business plans, to offer tax-relief and other incentives, and to do whatever possible to help convince people that biotechnology is happening where they are.

This is excellent news. The success of Germany's BioRegios, of the UK's Link and other programmes, of Ireland's BioResearch Ireland efforts, of Switzerland's Priority Biotechnology Programme and others point the way. With the realization that overnight success is impossible and that perseverance is critical, these and other efforts have great chances to emulate their US counterparts in the near future and this will be good for all.

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