

Making money from microbes

David Onions

● Making money out of microbiology is not new. It has been suggested that the origins of the earliest fermented beers range back as far as 5,000 years. Like the other staples arising from microorganisms, bread, wine and cheese, beer played an important part in early economies. In the last century, microbiology underwent two revolutions and in both cases the scientific developments and social benefits were dependent on interaction between scientists and new industries. Now in the midst of the second revolution, recombinant DNA, some of the features that have led to successful commercialization of scientific ideas are becoming apparent. These have included:

- The availability of venture capital
- Flexible employment contracts permitting staff of academic institutions to play a leading role in the formation of companies
- A scientifically driven and flexible regulatory environment
- A culture of enterprise.

It is no accident that the biotechnology revolution started in the USA and particularly in California where all of these elements have combined with outstanding success. In other countries where one or more of these elements has been lacking, progress has been delayed, despite the presence of world-class academic research. In Germany the 'gene laws' and rigid academic contracts inhibited biotechnology company development until the second half of the 1990s. In 1996 the German government initiated a programme to create one of the world's leading biotech sectors by 2000. While this policy resulted in a burst of company formation, rising from 225 in 1999 to 370 by 2001, the hasty creation of so many companies has inevitably led to failure of some and by 2002 the number had fallen to 360.

In the UK, the availability of start-up venture capital was certainly a problem in the 1980s and until recently entrepreneurial activities were viewed with some disquiet by the academic community. Nevertheless, the UK now has a thriving biotech industry with two primary centres in the London, Cambridge, Oxford triangle and a second one based around the biomedical universities in Scotland. A notable feature of the Scottish development has been the involvement of Enterprise Scotland, a government agency that has assisted in the creation of a receptive environment for biotechnology. One of the innovations in Scotland has been the establishment of Intermediary Technology Institutes aimed at fostering the transfer of academic activities into new industries.

Biotechnology is becoming one of the leading industries of the first half of this century. In the US biotechnology already generates annual revenues of 26 billion Euros and employs 142,000 people, many of them with backgrounds in microbiology. Europe lags



behind, but revenues increased by 10% in 2002 to 7.6 billion Euros while employment slipped a little to 33,000. While the focus of microbiology remains on the healthcare and food industries, new microbiological applications are emerging. Microbiology has been playing an increasing part in environmental remediation and the first steps have been made in applying the science to nanotechnology. Despite the setbacks that have been encountered, gene therapy will evolve as an adjunct therapeutic modality for cancer treatment and as a treatment for some genetic diseases.

In this edition of *Microbiology Today*, the experiences of microbiologists who have had the courage to start new companies and the experiences of scientists involved in public policy and safety provide a valuable insight into the commercialization of microbiology. Microbiology has a claim to be one of the major beneficial influences on societies in the last century. Technological change is often the driving force of social change and in this century microbiology will continue to transform lives in ways yet to be imagined. Continued success will depend upon public understanding and acceptance of our discipline, and upon synergistic and equitable arrangements between academia and industry.

● David Onions is Professor of Veterinary Virology at The University of Glasgow and was a founder of Q-One Biotech which was recently acquired by BioReliance.
Tel. 0141 946 9999
email d.onions@bioreliance.com

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Further reading

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