

Profile – Børge Diderichsen

Børge Diderichsen (Fig. 1) is the President of the European Federation of Biotechnology (EFB) and Vice President at Novo Nordisk (Denmark). After a master's degree in biochemistry, followed by a Ph.D. in microbiology, both from the University of Copenhagen, he joined Novo Industry as part of a small team of researchers who were to examine whether genetically modified organisms (GMOs) could be used in the production of insulin and industrial enzymes. Since then he has played an important role in Novo Nordisk's efforts to resolve many of the problems that arise in connection with the production of GMOs and was a pioneer in bringing some of the first industrial enzymes from GMOs onto the market. Diderichsen has many honorary titles and has served on a large number of boards and commissions. Most recently he was invited to join the Commissioner's Advisory Group for Life Sciences, Genomics and Biotechnology for Health corresponding to the 6th Framework Programme. For more than 20 years he has contributed to the public debate concerning genetic engineering and ethics, biotechnology and society, conditions for universities and public research among others. He has been a major force in reforming the EFB, of which he was elected president in January 2002.

What made you pursue a career in science?
For as long as I can remember, I have been interested in nature – the forest, its trees and animals, the sea and the sun, the wind and the waves. Like many other boys, curious and inquisitive, I did some primitive experiments to find out how things work. One day, when I was about 14 years old (in 1966), I came across a book on science. With simple illustrations, it showed that something invisible, yet with convincing semiotics, determined the properties of life. I still remember those colourful pages that first showed me a DNA molecule. I learned the full meaning of this mysterious abbreviation by heart, and enjoyed impressing my friends and scaring old aunts with my profound knowledge of the secrets of life. This fascination remained. It was an assumed



Fig 1. Børge Diderichsen.

fact, not to be questioned later, that I was going to study molecular genetics.

Who awarded you your first grant and what was it for?

As a Master of Science student at the Institute of Microbiology in Copenhagen, at the time headed by the renowned Professor Ole Maaløe, I isolated a novel mutant, *relB*, of the bacterium *Escherichia coli*. Brian F.C. Clark, then and now professor at Aarhus University, found me worthy to receive an EMBO short term fellowship to study this mutant with Professor Robert Lavallé in Bruxelles. This was the beginning of a long friendship that brought me back to Bruxelles to do my Ph.D. Brian Clark later became a mentor and a good friend, and today is a key figure in the European Federation of Biotechnology (EFB).

Explain what the EFB is and what it aims to do

The EFB (<http://www.efbweb.org>) was founded in 1978 to serve biotechnologists throughout Europe and beyond. The aims of the EFB are to advance the responsible use of biotechnology, to provide a forum for interdisciplinary and international collaboration, to improve scientific education and to facilitate informed

dialogue between scientists and the public. In short, our mission is to promote the safe, sustainable and beneficial use of Nature's resources through the application of knowledge in life sciences, engineering and technology. Membership of the EFB is open to individuals as well as to institutions. Since our new membership programme was introduced with our new statutes from July 2001, we have registered 2400 personal members, with ~100 more joining each month.

At present the EFB has eight sections each of which deals with a specific topic: applied biocatalysis, microbial physiology, biodiversity, agri-biotechnology, applied functional genomics, environmental biotechnology, pharma medical biotechnology and biochemical engineering science. In addition, several interdisciplinary 'task groups' have been established. One of these groups, 'Public Perceptions of Biotechnology', prepares general information about the applications of biotechnology, thus contributing to public debate on ethical and safety issues relating to biotechnology. Another group focuses on international issues and develops strategic and professional relations with areas outside Europe. Also in this regard, the EFB benefits from its good relations with the General Directorate Research at the European Commission. At present our main focus is on China, in relation to which we have initiated the 'European Focus on Biotechnology in China (EFBIC)'. With this project funded jointly by the EC and China, we aim to further professional contact and exchanges between European and Chinese scientists and to strengthen high-level strategic relations.

The EFB also arranges congresses and workshops including 'The European Congress on Biotechnology'. The next one will be held in Basel, August 24–29, 2003.

What is the role of biotechnology in modern society?

At the core of the applications of biotechnology is the principle of working in harmony, rather than in conflict, with Nature. Biotechnology can supplant technologies that pollute the biosphere or

deplete finite resources. However, academia, industry, government and the public need to work together to help fulfil its potential for industrial sustainability. The EFB is determined to do its part to see that this happens.

What do you think are the three major issues that the EFB should prioritize?

The three major global issues for which biotechnology could or should have an important role are climatic changes, sustainability and human health. It is the EFB's vision to help societies in the developed as well as the developing world to deal with the following three global issues, which are already related to actual and real threats to prosperity and health:

- Disappearance of arable land owing to reconfiguration of climatic patterns, rising temperatures and sea levels, regional droughts, flooding and erosion.
- Poverty increasing in regions that don't have the resources and the technology to cope with changes in the environment. Consequently millions of people will try to escape worsening living conditions seeking shelter in richer parts of the world.
- Detrimental effects on the health of humans, animals and plants being affected by changing living conditions, overpopulation, pollution and changing life styles.

What are the bottlenecks to solving these three issues?

Biotechnology offers a variety of approaches to deal with the consequences of global warming as well as the need to develop sustainable solutions and improve human health. To achieve this it is particularly important to:

- Improve ways of handling the huge amount of data to enable us to understand life processes, whether they relate to the metabolism of individual cells, development of diseases in the human body or the ability to assimilate nutrients, water and energy from the environment.
- Gather systematic information on biodiversity, biological resources and long-term patterns of responses to changes in the environment to understand the bio-complexity of ecosystems.
- Apply new knowledge and technologies to address major problems caused by pollution, unsustainable use of

resources, climatic changes, malnutrition and changing life styles as well as ensuring more growth with less waste in less affluent regions.

The Sections and Task Groups of the EFB are committed to connecting scientific knowledge and technological skills with EFB's vision that biotechnology can help society come to grips with global issues.

Tell me about the 'Ask the scientist' project that the 'Public Perceptions of Biotechnology' task group has set up.

The group, of which David Bennett (Delft, The Netherlands) is one of the key driving forces, launched its redesigned website in April 2002 including the 'Ask the Scientist' e-mail enquiry service. The original website (designed for scientists, lecturers and other professionals) had become increasingly used in recent years by school and higher education students, teachers, journalists and members of the general public.

The 'Ask the Scientist' section of the new website enables enquirers to send a question (related to one of the various areas covered by biotechnology) by e-mail that is then answered by scientific experts from throughout Europe. At the outset, 150 members of EFB and the European Molecular Biology Organisation volunteered to reply to enquirers, more joining later. Their responses to our request were enthusiastic – "This is the only way to go", was a typical reply. Enquirers can use any of the main European languages and each question will be answered in that language. Questions range across the whole of the life sciences and their applications. After six months up and running, 'Ask the Scientist' has proved to be a successful experiment that will certainly continue to be expanded.

Which aspect of all the EFB projects is closest to your heart?

At present I am concerned about how better relations between Europe and other, in particular less rich, regions of the world can be developed to share our global heritage and make the best possible use of biotechnology. For that purpose we have established a "Task Group on International Relations (TGIR)" headed by Brian Clark, which, as its first major activity, is managing a project funded by the European Commission to facilitate

collaborations between China and the EU in the field of biotechnology. This project called EFBIC (European Focus on Biotechnology in China) was launched only this year but has already given rise to important new initiatives. Based on this promising experience we are currently considering setting up similar projects with other regions, such as Latin-America, and would therefore welcome contact with scientists who have the appropriate background and enthusiasm for such endeavours.

Using EFBIC as a platform, we are also discussing whether the EFB, together with other respected organisations, could launch a new initiative, tentatively called 'Global Responsibilities in Life Sciences and Applications'. The purpose of this would be to share knowledge and technology in the life sciences and take the initiatives necessary to help less-developed regions overcome the obstacles they face through the use of biotechnology. In short, we want to ensure sustainable growth as well as to help cross the global divide in the application of biotechnology and access to its products.

Such an initiative would be in line with 'Life Sciences and Biotechnology: A Strategy for Europe Action Plan' recently published by the European Commission. We therefore hope that the EFB in this and other regards can build on our excellent relations with the European Commission and help its visions for biotechnology to be put into practice.

What do you predict will be the next milestone in biotechnological research?

The next major milestone will be reached when developmental processes in animals or plants have been understood, and to some extent can be controlled. This will have profound consequences for the prevention and treatment of diseases, for sustainable agriculture and for the use of plant material for a plethora of new purposes to the benefit of man and environment. Although there will be plenty of ethical dilemmas along the way, that we must face in an open, informed and respectful manner, the common goal must be to make better use of Nature's resources to create a better future for mankind.

Børge Diderichsen was interviewed by Suzanne Berry, Editor *Trends in Biotechnology* (suzanne.berry@eslo.co.uk).