In the past 10 years the European Initiative for Biotechnology Education (EIBE) has successfully promoted the treatment of biotechnical topics in lessons at compulsory schools in the E.U. and eastern Europe. Comprehensive lesson units for 20 biotechnology topics were developed by this network encompassing more than 40 experts from 28 institutions and 17 countries. The units were tested in the countries involved and used in national and international teacher training courses. The most important pre-requisites were, thus, created for the dissemination and implementation of the materials. It was shown that the suggestions for instruction were most suitable for conveying a basal understanding for biotechnological topics, for soliciting a balanced, founded judgement about controversial problems connected with biotechnology.

The materials are available in various European languages on the internet (www.eibe.org) and can be downloaded free of charge. As the demand for the materials is increasing, it will be possible to access them after the initiative's funding by the European Commission ends at the end of 2000.

The experts involved in EIBE would like to thank the European Commission for its generous support and intensive efforts to promote biotechnology in teaching. As biotechnology is rapidly developing, and new biotechnological topics and problems will dominate public debates, further support of the pedagogical accompaniment of this development is important and necessary. The experts involved in the network plan to continue their cooperation with new focal points. In their countries they will continue to try to find understanding for biotechnology and direct the public to an impartial opinion. They are also available as consultants for syllabus commissions, for school administrations and for teachers.

I would like to thank everyone involved for their active and very successful work over the past 10 years, especially Mrs. Renate Glawe, IPN, Kiel, and Dr. Caroline Shearer, N C B E, Reading, for their unflagging efforts concerning the organization EIBE and the publication of the teaching materials on the internet.

Horst Bayrhuber
IPN, KIEL, EIBE Coordinator

European Initiative for Biotechnology Education

The European Initiative for Biotechnology Education (E.I.B.E.) seeks to promote skills, enhance understanding and facilitate informed public debate through improved biotechnology education in schools and colleges throughout the European Union (EU). It is funded through the Biotechnology Programme of the European Commission’s Fourth Framework.

Ingvar Lindqvist prize

In 1991 the Royal Swedish Academy of Sciences instituted a prize to be given to teachers of natural sciences to encourage new ideas, enthusiasm, and skilful teaching in physics, chemistry, biology and mathematics. The award is called the Ingvar Lindqvist prize after the person who took the initiative within the Academy, and who saw the need for encouragement of young students at an early stage in science.

On March 3, 2000 I was awarded this prize together with three other teachers and we all received it from H is M ajesty the K ing of Sweden. I was awarded the prize for my development of education in biotechnology in the Swedish school system at the gymnasium level and also for organising courses for science teachers. Since 1994, I have run such courses during the summer vacations. I can only accommodate 20 participants at a time on a course. This year I had more than 60 applicants, indicating that the courses have become very popular. I have had great help in running the courses from John Schollar and Dean M adden from Reading, U.K. Since 1995 they have come each year to the K ristineberg M arine Research Station with a van loaded with EIBE materials.

A special feature of the courses has been to include one or two non-science teachers who could enhance discussion of moral problems arising from new techniques being used in biotechnology.

When Sweden joined the E.U in 1995, I had the opportunity to become a member of EIBE and from then on I have used much of their materials, in my summer courses. Because of the popularity of the courses, the use of EIBE material has spread over Sweden. I have also used the materials in my ordinary teaching in the gymnasium.

As a result of EIBE I have gained much knowledge in biotechnology and also many new ideas, and this has been of great importance for my teaching and also for my recognition for the Ingvar Lindqvist award.

Elisabeth Strömberg
SVERIGE
On 7 April, 50 teachers from different kinds of lycées (general, technical and professional) met in the agreeable surroundings of Bischenberg which is in the wine country on the outskirts of Strasbourg. This meeting was presided over by the Rector of the Strasbourg Academy assisted by Madame Rose Aimée Lupon and Monsieur Michel Gavrilovic (Regional Inspectors), Madame Baumert (Inspector for Technical Education), and Monsieur Michel Clerc (national co-ordinator for the SMS-Biotechnology network). During the meeting two members of EIBE - Dr Jan Frings (NL) and John Watson (L) - gave presentations.

Mme Kirsch, professor of scientific methods at the Louis Pasteur University of Strasbourg, lectured on the subject of Interdisciplinary teaching, its importance and the difficulties of putting it into practice. This was followed by Jan Frings who presented the aims of EIBE and what we had done to achieve our objectives. He then chose one of the EIBE units as an example - Unit 4 - Issues of human genetics. John Watson then gave a particularly lively tour of the EIBE web site (http://www.eibe.org) using the excellent projection facilities available. He finished with a detailed look at Unit 18 - The EIBE family. This unit was designed as a practical gene screening simulation but John Watson demonstrated how it could be used as an interactive over-head projector demonstration.

The teachers present were drawn from many fields: science and technology, literary subjects, languages, economics, history and human sciences. All left with a copy of the EIBE CD-ROM convinced of the quality and interest of the material. Let us hope they will be able to use these materials, after any necessary adaptations, in their teaching.

Gérard Coutouly
STRASBOURG

Spanish plans

Over the next three years, the Spanish EIBE team hopes to implement a project entitled A Study of socio-scholastic perception of Biotechnology through the Internet, with public funding from the Spanish I+D programme.

There are three objectives:

To identify, analyse and contextualise the perceptions of science teachers and students at obligatory schooling level with regard to biotechnology and its inclusion in the curriculum. This study, on socio-educational perceptions of biotechnology in the school context will help us to define criteria and norms for educational behaviour. Specifically, we hope to obtain information regarding:

• conceptual errors of a scientific-technological nature;
• ethical and moral dilemmas;
• negative and positive perceptions;
• understanding the limits and possibilities of biotechnology.

Secondly we want to increase the number of EIBE units adapted for the Spanish educational context. The three new units chosen for adaptation are the following: Transgenic Animals, The Human Genome Project and Biotechnology, past and present. With these units, the group of EIBE units in Spanish will increase to 8.

Lastly, we want to make a special effort to disseminate EIBE units that are translated in Spanish, as well as the case studies that have been produced about the project, via a web page. The aim here is to increase the implementation of biotechnological topics in secondary education both for Spanish teachers and for Science teachers of the educational systems of Latin American countries.

We hope that the web page The Biotechnology Classroom - as we shall call it- will be useful as:

• an educational and teaching resource for teachers, who may use the units they are interested in, as well as giving them the possibility of linking up with the Spanish EIBE team for advice and complementary documentation on each of the units;
• a meeting and debate forum on the teaching of biotechnology and its perception within the school context;
• a public window for the dissemination of progress and development in biotechnology education and of studies that are carried out in this field, as well as any related events;
• a reference point for the Spanish-speaking world on the teaching of biotechnology and its socio-scholastic perception.

Angela Gómez-Niño
ESPAÑA

Gérard Coutouly
STRASBOURG

http://www.eibe.org
Use of the EIBE website

May 1999 to October 2000
‘hits’: number of successful requests per month
MB data: megabytes of data downloaded per month

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The Nitrogen Cycle

Every living organism needs nitrogen.

About 80% of the atmosphere is N₂.

Plants and animals therefore depend on nitrogen compounds which arise in three main ways:

- Biological nitrogen fixation (by bacteria);
- Decomposition of organic matter by micro-organisms;
- LEACHING of ‘artificial’ fertilisers.

Animals cannot use atmospheric nitrogen.

Plants cannot use atmospheric nitrogen.

How to play the Enzyme Game

A game that explores the production and use of commercial enzymes
Xenotransplantation or xenografting is the transplantation between different species of organs, tissue or cells. Transplanting animal organs into humans could solve the problems of transplant waiting lists. But there are also a lot of associated issues to consider:

- Will animal organs (or cells) work properly in humans?
- Will they be rejected by the human immune system?
- Will new diseases pass from animals into the human population (AIDS is relevant in this context)?
- Is it right to use animals in this way?

Let us look at these questions. The major problem of all transplantation organ rejection. The immune system will reject the ‘foreign’ organ and destroy it. The rejection will be more severe when there are big genetic differences between the host and the recipient. To overcome rejection it is necessary to make genetically modified animals (mostly pigs), that have a human gene which makes the organs more ‘human’. Even then life-long medication with immune-suppression drugs is needed to help the human body accept the organ.

The risk of new infectious diseases is another important issue. To reduce this risk, source animals should be reared in conditions in which all known infectious organisms are monitored and controlled (specified-pathogen-free conditions). But that means that those animals live in a sterile surrounding and can’t live ‘free’ in the field.

That brings us to the last question: Is it right to use animals in this way? Some people will answer positively: we eat animals so we use them already. But others will have serious problems with it.

Although xenotransplantation is not yet a realistic option it could be within 10-15 years. So it is a good thing that we can discuss the problems now.

If you are interested, take a look at: www.xenotransplantatie.nl and www.biodebat.nl (in Dutch only).