



E.I.B.E.

DECEMBER 2000

NEWSLETTER N° 9

EDITORIAL

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 EU 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

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 skillful 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 His Majesty the King 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

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.

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 coopera-

tion 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, NCBE, 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

for organising courses for science teachers. Since 1994, I have run such courses during the summer vacations. I can only accommodate 20 participant 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 Madden from Reading, U.K. Since 1995 they have come each year to the Kristineberg Marine 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 EU 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

Presentation of EIBE and its educational materials to teachers in Alsace



On 7 April, 50 teachers from different kinds of lycées (general, technical and professional) met in the agreeable surroundings of Bischberg 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 carried out, the experiences implemented and the reports and articles 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



Netscape: Unit 11: Transgenic animals.

Location: http://www.eibe.org/ENGLISH/U11.HTM

life saving medicine in her milk.

Human genetics: debate of a personal dilemma

Practical Immunology

Transgenic plants I

Transgenic plants II: an ethical debate

Transgenic animals

A model European Council

The human genome project

Biotechnology and Developing Countries

Biotechnology and the environment

Biotechnology past and present

The EIBE family

Biotechnology education through drama

The enzyme game

Contents

Introduction

- Definition of genetically modified animals
- How genes are transferred to animals
- Other considerations

Disease models

- A mouse against cancer

Human food

- The somotoris salmon

Production of pharmaceutical products

- The alpha-1-antitrypsin sheep

The future

- Future plans
- New developments
- New directions

Contacts Contents Newsletter Copyright Safety Links

NEW

Prevention of environmental damage

The Nitrogen Cycle

Do you know?

- About 80% of the atmosphere is N₂.
- Every living organism needs nitrogen. It is used to synthesize proteins, nucleic acids and other important organic molecules.
- Animals cannot use atmospheric nitrogen and depend on animal or plant food sources for their supply.
- Plants cannot use atmospheric nitrogen.
- 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;
 - chemical processes for the manufacture of artificial fertilizers.

Figure 5. The Nitrogen cycle

EIBE European Institute for Biotechnology Education 2000.

Educational drama

Aims

Intrinsic:

- These are mainly to do with personal development of the player, and only a little to do with the development of dramatic skills. The central aims are for the player to develop:
 - self-confidence;
 - emotional maturity;
 - self-awareness;
 - awareness of others;
 - ability to work as part of a group;
 - communication skills.

Extrinsic:

- These concentrate on the situation, the surroundings and real life of the player. The central aims are for the player to develop:
 - insight into his/her situation and an understanding of how to change it;
 - increased knowledge/understanding of the topic (language, history, literature, politics, social studies)

Artistic:

- The central aims are for the player to:
 - gain an insight into and knowledge of the creative process in the theatre;
 - develop creative and critical skills as both player and audience.

Objectives

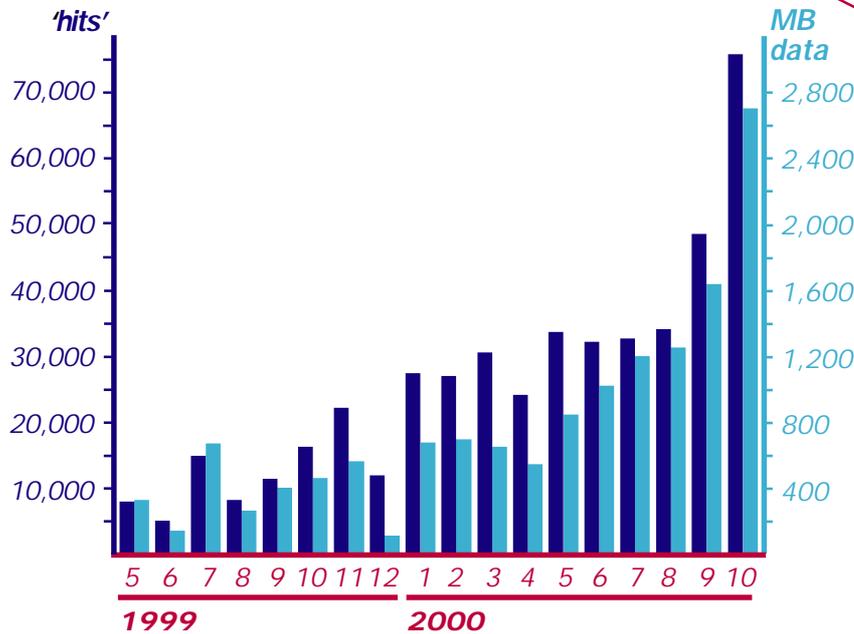
Communication:

- Producing a play challenges all the participants to clarify their own attitudes and wishes. Participants will gain a better understanding of how to:
 - understand his/her own and others' feelings, individually and as part of a group;
 - express these feelings in aspects of the play;
 - explore and enlarge upon intention;
 - understand the balance between reality

EIBE European Institute for Biotechnology Education 2000.

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



The Enzyme Game

How to play the Enzyme Game

A game that explores the production and use of commercial enzymes

Xenotransplantation

In the Netherlands as well as most other European countries, there is a shortage of human organs for transplantation purposes. Since attempts to get more donor organs by conventional means are not proving very successful, xenotransplantation has been considered as a new option. Most people however do not know what xenotransplantation is and what the benefits could be. That is why the Dutch Government has initiated a public debate about it.

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 transplantations is organ rejection. The immune system will recognise 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 surroundings 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).

Liesbeth van de Grint
NEDERLAND

E.I.B.E.

BELGIË/BELGIQUE

Prof. Dr. Vic DAMEN/ Marleen van STRYDONCK, Universitaire Instelling Antwerpen (U.I.A.), Department Didactiek en Kritiek, Universiteitsplein 1, 2610 Antwerpen, email mvstryd@uia.ua.ac.be
Dr. Maurice LEX, EC, GD XII E-1, SDME 9/38, Rue de la Loi 200, 1049 Bruxelles, Fax 0032/2/299-1860

BULGARIA

Prof. Raycho DIMKOV, University of Sofia "St. Kliment Ohridski", Faculty of Biology, Dr. Tzankov blvd. No. 8, 1421 Sofia, email ray@biofac.uni-sofia.bg

ČESKÁ REPUBLIKA

Dr. Hana NOVÁKOVÁ, Pedagogprogram co-op Pedagogická Fakulta UK, Konevova 241, 1300 Praha 3, Fax +420/2/6845071

DANMARK

Dr. Dorte HAMMELEV, Association of Danish Biologists, Sønderjyllands Alle 2, 2000 Frederiksberg, email dorte@centrum.dk, **Mrs Lisbet MARCUSSEN**, Association of Danish Biologists, Skolebakken 13, 5800 Nyborg, email lisbetma@post2.tele.dk

DEUTSCHLAND

Prof. Dr. Horst BAYRHUBER/ Dr. Eckhard R. LUCIUS/ Mrs Renate GLAWE, Institut für die Pädagogik der Naturwissenschaften (IPN) an der Universität Kiel, Olshausenstr. 62, 24098 Kiel, email bayrhuber@ipn.uni-kiel.de, lucius@ipn.uni-kiel.de, glawe@ipn.uni-kiel.de, **Dr. Ognian SERAFIMOV**, INCS-Centre of UNESCO, c/o Jörg-Zürn-Gewerbeschule, Rauensteinstr. 17, 88662 Überlingen, email joergzuern.os@t-online.de, ognian.serafimov@t-online.de, **Prof. Dr. Eberhardt TODT**, Universität Giessen, FB Psychologie, Otto-Behagel Str. 10, 35394 Giessen, email Eberhardt.Todt@psychol.uni-giessen.de, **Prof. Dr. Michael SCHALLIES**, Pädagogische Hochschule, Heidelberg, FB Chemie, Im Neuenheimer Feld 561, 69120 Heidelberg, email schallie@ph-heidelberg.de

EESTI

Prof. Dr. Tago SARAPUU, Science Didactics Dept., University of Tartu, Vanemuise 46-211, Tartu 51014, email tago@ut.ee

EIRE

Dr. Catherine ADLEY, University of Limerick, Biotechnology Awareness Centre, Dept. of Chemical and Environmental Sciences, Limerick, email Catherine.Adley@ul.ie, **Mrs. Cecily LEONARD**, University of Limerick, Dept. of Life Sciences, Limerick, email cecilyleonard@ul.ie

ELLADA

Prof. Vasilis KOULADIS/ Ass. Prof. Vasiliki ZOGZA-DIMITRIADI, University of Patras, Dept. of Education, Rion, 26500 Patras, email zogza@upatras.gr, koulaidi@upatras.gr

ESPAÑA

Dr. María J. SÁEZ, Dr. Angela GÓMEZ-NIÑO/ Rosa VILLAMANAN, Universidad de Valladolid, Dept. de Biología Celular y Farmacología, Geologo Hernandez Pacheco 1, Valladolid 47014, email mariaj@redestb.es, Angela@biocel.uva.es, rvillama@dce.uva.es

FRANCE

Dr. Gérard COUTOULY, LEGPT Jean Rostand, 18, Boulevard de la Victoire, 67084 Strasbourg Cedex, email coutouly@cybercable.tm.fr, **Prof. Laurence SIMONNEAUX**, ENFA, Toulouse, Boîte Postale 87, 31326 Castanet-Tolosan Cedex, email laurence.simonneaux@educagri.fr

ITALIA

Prof. A. BARGELLES-SEVERI/ Dr. Stefania UCCELLI/ Dr. ssa. A. CORDA-MANNINO, Centro di Biotecnologie Avanzate, Largo Rosanna Benzi 10, 16132 Genova., email dcs@ist.unige.it

LUXEMBOURG

Mr. John WATSON/ Laurent KIEFFER, European School, 23 BLVD Konrad Adenauer, 1115 Luxembourg, email krit@eursc.org, john.watson@ci.edu.lu

NEDERLAND

Dr. David J. BENNETT, European Federation of Biotechnology Working Party on Education, Cambridge Biomedical Consultants, Oude Delft 60, NL-2611 CD Delft, email erf.cbc@stm.tudelft.nl, **Dr. Fred BRINKMAN**, Hogeschool Holland, Communication Project, P.O. Box 261, 1110 AG Diemen, email f.brinkman@hsholland.nl, **Drs. Liesbeth van de GRINT**, email lvdgrint@bio.vu.nl, **Dr. Jan F.J. FRINGS**, Pr. Marijkelaan 10, 7204 AA Zutphen, email j.frings@hccnet.nl, **Dr. Ana-Maria BRAVO-ANGEL**, Secretariat of the Task Group on Public Perceptions of Biotechnology, Oude Delft 60, NL-2611 CD Delft, email erf.cbc@stm.tudelft.nl

RZECZPOSPOLITA POLSKA

Dr. Anna STERNICKA, Uniwersytet Gdanski, Wydział, Al. Legionów 9, 80952 Gdansk, bioas@univ.gda.pl

SCHWEIZ

Dr. Kirsten SCHLÜTER, Höheres Lehramt Mittelschulen der Universität Zürich, Winterthurerstr. 30, CH-8033 Zürich, email kschluet@hlm.unizh.ch

SVERIGE

Mrs. Margareta JOHANSSON, Föreningen Gensyn, P.O. Box 37, 26821 Svalöv, email henrik.johansson@mbox372.swipnet.net, **Dr. Elisabeth STRÖMBERG**, Östrabogymnasiet, Kämpogatan 36, 45181 Uddevalla, email es@ostrabo.uddevalla.se

THE UNITED KINGDOM

Dr. John GRAINGER/ Mr. John SCHOLLAR/ Dr. Caroline SHEARER, National Centre for Biotechnology Education, The University of Reading, Whiteknights, P.O. Box 228, Reading RG6 6AJ, email j.m.grainger@rdg.ac.uk, j.w.schollar@rdg.ac.uk, c.shearer@rdg.ac.uk, **Mr. Wilbert GARVIN**, email wilbert@leaghand.fsnet.co.uk, **Dr. Jill TURNER**, The Medical Biology Centre, Queen's University of Belfast, 97 Lisburn Road, Belfast BT9 7BL, email jill.turner@queens-belfast.ac.uk, **Dr. Paul WYMER**, 6 Park Way, Whetstone London N20 0XP, email paul.wymer@virgin.net, **Dr. Jenny LEWIS**, University of Leeds, Centre for Studies in Science and Mathematics Education, Leeds LS2 9JT, email j.m.lewis@education.leeds.ac.uk, **Mr. Adam HEDGECOE**, University College London, Dept. of Science and Technology Studies, Gower Street, London WC1E 6BT, email a.hedgecoe@ucl.ac.uk

E.I.B.E. co-ordinator

Prof. Dr. Horst BAYRHUBER, Institut für die Pädagogik der Naturwissenschaften (IPN) an der Universität Kiel, Olshausenstr. 62, 24098 Kiel, Deutschland. Tel.: +49-431-880-3129, Fax: +49-431-880-3132 email: bayrhuber@ipn.uni-kiel.de

E.I.B.E. secretariat

Renate GLAWE, IPN an der Universität Kiel, Deutschland. Tel.: +49-431-880 5132, Fax +49-431-880 3132, email glawe@ipn.uni-kiel.de

E.I.B.E. Editorial Board: **Paul Wymer, Horst Bayrhuber, Jan Frings, Ognian Serafimov.**

Designed and typeset by: **Caroline Shearer, NCBE, Reading, UK.**

Reproduction from E.I.B.E. Newsletter is permitted for educational purposes with reference to the source.