



## 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.*

The word biology is relatively young; it dates from 1802. After a lag time during which it was synonymous (in the eyes of non-biologists) with activities like butterfly hunting, we now find ourselves surrounded by terms like bio-ethics, bio-informatics and biotechnology. Biology is everywhere now, even computers are said to have viruses and clones. Undoubtedly it is a virtue of biotechnology that ethics has been brought to the attention of the public. Ethics is, as everybody now knows, concerned with what we ought or ought not to do.

Much of the ethical discussion concerns the transformation of crop plants or animals with foreign DNA. Whatever their outlook, it is widely held by the public that consumers ought to have the freedom to choose between alternatives. This is addressed by labelling rules. Another ethical aspect, earlier in the

production chain, that also vies for attention concerns companies which induce farmers to use only their products, e.g. seeds and herbicides. Companies of course, want to earn back the money they invested; at least their shareholders require them to do so. However, it would be quite unsatisfactory if there were a special ethics for business, allowing companies to recover invested money as quickly as possible, preferably with a profit. Rumours that companies behave like this make people uneasy; they make people rebel. Further rumours of information 'smoke-screens' exacerbate the situation. It all provides an atmosphere conducive to the acceptance of dubious

experimental results. It also provokes discussion between deaf people. It is known by now that knowledge in itself does not lead automatically to acceptance. Yet transparency is the only way to convince consumers that they are taken seriously.

The policy of E.I.B.E. is to provide the best possible means -to students as well anybody else- of developing an independent and balanced view about biotechnological issues. The views may be different. But real discussions are no problem.

**Jan Frings**  
NEDERLAND

## Swiss and German teachers meet in Überlingen

About 15 teachers from Germany and Switzerland recently attended an in-service training course at the Jörg-Zürn Technical High School in Überlingen on Lake Constance. Organised by E.I.B.E. in June, this was the first in-service training course on biotechnology in the school for representatives of both countries.

During the two days the participants gained much hands-on experience of E.I.B.E. programmes under the enthusiastic guidance of John Schollar (NCBE, The University of Reading, UK) and Wilbert Garvin (The Queen's University of Belfast, UK). They also learned about achievements and problems in Swiss schools and about social issues surrounding developments in biotechnology from Kirsten Schlüter

*Photo (copyright by German magazine CLB Chemie in Labor und Biotechnik): Dr. Anna Sternicka (Poland), Prof. Dr. Kurt Frischknecht (Switzerland) and Prof. Dr. Raytcho Dimkov (Bulgaria) learning about some of the E.I.B.E. teaching materials.*



(ETH, Zurich) and Esther Schärer (Nestlé Foundation, Vevey) In the ensuing discussions participants agreed E.I.B.E. should continue their effort to raise awareness of biotechnology among teachers in both countries.

New E.I.B.E. members from Bulgaria, Czech Republic, Estonia and Poland

came also to Überlingen as observers. These representatives were encouraged by their experience of the course to organise similar events in their own countries.

**Ognian Serafimov**  
Jörg-Zürn-Gewerbeschule, DEUTSCHLAND

**The Ninth European Congress on Biotechnology** took place in Brussels from the 11th -15th July 1999. This famous congress was organised by the Branche Belge de la Societe de Chimie Industrielle on behalf the European Federation for Biotechnology and a consortium of Belgium-based non profit organisations. It was supported by the Commission of the European Communities and by the Minister for Economy for the Brussels Region.

Eminent scientists mostly from the industrialised world attended this congress to exchange information about different areas of application and research in biotechnology. Symposia were organised on: agriculture and food, the environment, animal and human health, chemical manufacturing as well as on social and economic dimensions of biotechnology.

Horst Bayrhuber from the Institute for Science Education in Kiel/Germany and John Grainger from the NCBE, The University of Reading/UK were invited to organise a session about E.I.B.E.'s work in biotechnology. Participants in E.I.B.E. were invited to present various aspects: Laurence Simonneaux gave a lecture about her research on students conceptions on cloning before and after the birth of *Dolly*; Corinna Höble presented the results of her research on school students' moral judgement of gene technology; Maria Sáez talked about the evaluation of E.I.B.E. units in Spain and John Grainger talked about the network of academe/industry links with education in the UK.

After the presentations an interesting discussion took place reflecting the interest of delegates in two main aspects:

- the experiences of E.I.B.E. members when combining descriptive and normative dimensions of biotechnology in biology teaching;
- the implementation and evaluation of the E.I.B.E. units in different European countries.

There was a consensus that the education of biology teachers should not only consider scientific knowledge but also philosophical aspects of biotechnology.

**Horst Bayrhuber and Corinna Höble**  
IPN, Kiel DEUTSCHLAND

**Y Touring** is a professional theatre company for young people. Through high quality theatrical productions, the company helps create a greater awareness and understanding of sensitive, contemporary concerns that affect our lives.

Between 1995 and 1998 Y Touring Theatre Company commissioned, developed and produced a trilogy of plays about contemporary biotechnology.

### **The Gift**

*by Nicola Baldwin is a play addressing contemporary issues in genetics.*

*The Gift* tells the story of two generations of the Kay Family's struggle and eventual victory over an inherited terminal disease in an entertaining and deeply moving way.

1998 - 16 year old Annie Kay is destined to be a great football player when she is struck down by a long term genetic illness. Her 14 year old brother Ryan fights for the right to be tested for the illness.

2028 - 16 year old Mark a fast rising tennis star discovers that he was selected at conception by his father Ryan a commercial geneticist.

### **Pig in the Middle**

*by Judy Upton is a play about xenotransplantation.*

Sixth former Gemma and sixteen year old Ryan meet at the local renal unit whilst undergoing dialysis. Despite their differences (Ryan is mad keen on football and clubbing, while Gemma would rather spend her free time helping out at the local animal sanctuary and sabotaging fox hunts) romance blossoms. That is until Ryan is offered the opportunity to be one of the first patients to benefit from a new treatment, a kidney from a pig.

### **Cracked**

*by Nicola Baldwin is a play about mental illness.*

Toni is a bright and gregarious teenager whose descent into depression is triggered by the pressures of family and school. She develops an obsession with troubled rock star Mickey Mitch and turns to self-harm for release of feelings that she cannot understand. Toni's condition goes unrecognized by family and friends. Distraught, she eventually runs away from home and is found sleeping rough and contemplating suicide.

Fortunately, Toni has the support of a close friend, Joe, and a sympathetic doctor, Mary, who struggles to convince her that her inner turmoil is part of a depressive illness.

*Cracked* is written for young people aged 14-19 years and aims to develop an awareness of depression as a treatable mental illness and to reduce the associated stigma experienced by sufferers.

Each play is followed by a live debate involving the audience and the cast who stay in character to field questions. Each play is supported by a resource pack, written in consultation with scientists, doctors, and patients.

The trilogy has been universally acclaimed both by the worlds of science and the arts for their artistic achievement as first class dramas and as a ground breaking model for future dramas that bridge the worlds of science and the arts.

### **Developments**

As a result of the success of the original projects, the John Innes Centre and the Teacher Scientist Network approached Y Touring to develop and produce a Theatre of Debate project about genetically modified (GM) food. Y Touring commissioned Jonathan Hall to write *Sweet as you are*. The drama centres around two people and the influence they have on a person undecided about many things in life, not just the question of GM food. The production of *Sweet as you are* by won a coveted Scotsman Fringe First Award for an outstanding production of a new play at the 1999 Edinburgh Festival.

### **The Future**

Y Touring are currently developing a three part *Theatre of Debate* programme on potential uses of cloning technology, for 14 plus and the public, consisting of a play to be written by Jonathan Hall, a debate and an education pack. The new production will have its premiere in Autumn 2000

*If you would like to find out more about Y Touring's work and in particular have a look at our online resources for The Gift, point your browsers to:*  
<http://www.ytouring.org.uk>.

*Our address is:*

*Y Touring,  
Islington YMCA, 10 Lennox Rd,  
Finsbury Park, London N43W.  
Tel: 02072725755, Fax: 02072728413.  
Email: [Nigeltownsend@ytouring.org.uk](mailto:Nigeltownsend@ytouring.org.uk)*

*Needless to say we are always interested in exploring any ways of touring Europe or developing new partnership projects with other organisations or individuals.*

**Nigel Townsend**  
Y Touring, UK

# The Task Group on Public Perceptions of Biotechnology

The Task Group exists to promote public understanding and informed public debate of modern biotechnology in Europe. It has a very broad membership, including scientists, industrialists, environmentalists, journalists and others with an interest in communicating about biotechnology with the general public. The interesting perspective of our Task Group is that it is independent of all particular interests, and does not seek to promote any particular point of view about biotechnological applications.

The Task Group undertakes many activities designed to improve the quality of public debate about modern biotechnology in Europe with the support of the European Commission DGXII. We produce several publications, organise training workshops and conferences, etc.

Our publications are designed to provide concise, objective overviews of particular issues for the benefit of the non-specialist. Below you will find a list of our most recent publications.

- 1.\* *Ethical Aspects of Agricultural Biotechnology* report. ISBN 90-76110-05-0. 64pp.
2. Handbook *Biotechnology for non-specialists* Second Edition. An updated listing of selected public information materials, organisations contactable for information, web sites, etc. for those seeking information on biotechnology. July 1999. ISBN 90-76110-06-9. 368pp.
- 3.\* *Environmental Biotechnology*. Briefing paper 4, Second Edition, January 1999. 4pp.
- 4.\* *Biotechnology Legislation in Central & Eastern Europe*. Briefing paper 9, June 1999. 4pp.
5. *New paradigm: New policies healthcare and the new genetics in Britain and Germany*. Seminar report 27-29 November 1998 at Hinxton Hall. A report highlighting the discussions held during a seminar on what needs to happen if the promise of genetic medicine is to be fulfilled. These countries have very different methods of organising health care delivery for their citizens and this provided a vital stimulus to the debate, challenging assumptions and questioning traditional ways of thinking. July 1999. ISBN 0-9533596-0-6. 29pp.
- 6.\* *Focus on Future Issues in Biotechnology*. Workshop report 7-9 April 1999 at Killiney Bay, Dublin. This report presents and further develops the statements produced by the participants during a three-day think tank on future issues in biotechnology and its potential contributions to a more sustainable agriculture. ISBN 90-76110-08-5. 10pp.
- 7.\* *Dialogue in Biotechnology*. A workshop report (20 April 1998) on best practices in conducting public dialogues. ISBN 90-76110-04-2. 12pp.
- 8.\* *Public Opinion about Biotechnology: a Survey of Surveys*. A collation of public opinion surveys on biotechnology. It is intended as a reference guide to the public opinion survey information that is available in European and other countries. To be updated in 2000. ISBN 90-76110-03-4. 54pp.

\* These reports are available and downloadable for free from our website.

Available from the EFB Task Group on Public Perceptions of Biotechnology Secretariat:

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Website: <http://www.kluyver.stm.tudelft.nl/efb/home.htm>

If you have any further queries, please contact:

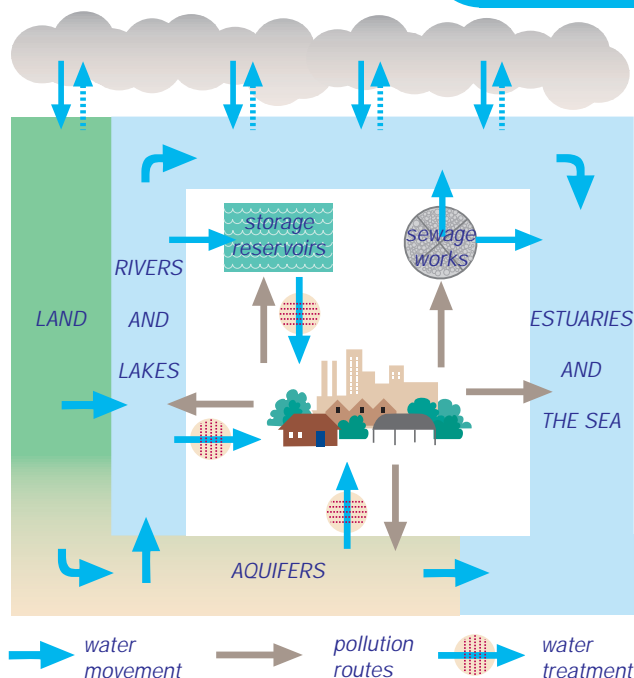
**Ana Maria Bravo-Angel**

*Task Group on Public Perceptions of Biotechnology, NEDERLAND*

Unit 17, Fig. 2 illustrates the routes of pollution arising from increases in population and industrialisation which affect the basic water cycle.

## Biotechnology: Past and Present extract from Unit 17

If you want to know more about E.I.B.E. units have a look under the address: <http://www.eibe.org>



### **The role of environmental biotechnology**

Environmental biotechnology is the application of biotechnology for the protection and restoration of the environment. As with other applications of biotechnology, use was being made of 'environmental biotechnology' long before the term came into use. Systems for the purification of water by filtration and the treatment of sewage on a municipal basis were developed in the second half of the 19th century by civil engineers but it was not fully realised that microbiological processes were involved until the 1930s. Gradually mechanical engineers increasingly worked in collaboration with biologists in the true interdisciplinary spirit of biotechnology to develop improved biological systems for dealing with the increasing volume of polluted water produced by society and industry and to meet their ever-growing demands.



# Teaching biotechnology - the science/humanity split and E.I.B.E.

During E.I.B.E.'s evaluation of our own progress and on the basis of research (Michael, Grinyer and Turner, 1997), it has become increasingly apparent that introducing a balanced content of biotechnology is difficult, even when ostensibly suitable educational material is at hand. There are probably many individual, institutional and cultural reasons for this, but one significant reason appears to be located in the disciplinary split between science and the humanities. On one hand, many science teachers are diffident about crossing the boundaries of the science of biotechnology and teaching the social, ethical and legal implications of it. On the other, many humanity teachers do not appear naturally inclined to tackle what they perceive as

scientific texts. Of course, the debate about how much science people (students and teachers) need to know in order to understand salient issues continues to be a subject of controversy amongst educationalists and those wishing to promote the Public Understanding of Science. But in the meantime, E.I.B.E. has an immediate problem - how to ensure that the educational units they have produced for use by all teachers get used by humanity teachers? This problem extends beyond our immediate concerns and has wider educational and democratic consequences.

A subgroup of E.I.B.E. members with an interest in expanding the focus of biotechnology education into areas of social and ethical concerns are currently

setting up workshops with humanity teachers. These will take place in different European countries in order to explore how teachers can best utilise, or adapt the units for their own teaching and student needs. The results from these workshops and their evaluation promises to offer some concrete understandings of the problem. The results are scheduled to be available by the end of 2000. Thus far, we expect comparative information from England, France, Italy, Denmark, Sweden, Holland and the Czech Republic. In addition to these activities the group is also exploring ideas of improved ways of integrating biotechnology and the humanities, for example, through drama and language school projects.

Michael, M., Grinyer, A., Turner, J. (1997) *Teaching Biotechnology: Identity in the context of ignorance and knowledgeability*. Public Understanding of Science. 6 1-17. The Science Museum, London, UK

Jill Turner  
*The Queen's University of Belfast, UK*

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