MANIFESTO FOR BIOTECHNOLOGY 2001

'The science of biotechnology is likely to be, to the first half of the 21st century, what the computer was to the second half of the 20th century'

The Right Honourable **Tony Blair MP** *Prime Minister*

Xenova Group plc

British Biotech plc

Photonica

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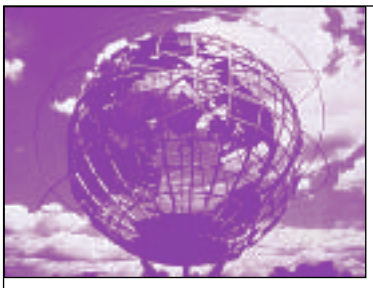
The Benefits of Biotechnology

'50% of the world's diseases still have no cure. Yet, over the next twenty years, biotechnology will offer us ways of heading off the mass-killers in our society such as cancer, heart disease and diabetes'.

Dr Paul Drayson *Chairman and CEO of PowderJect Pharmaceutical and Chairman of the BIA*

- **The BIA is committed to ensuring that the enormous potential of developments in biotechnology is fulfilled.**
- **The BIA represents companies working in every application of biotechnology, including pharmaceuticals, environmental biotech and crops and food.**
- **We aim to communicate biotech's benefits to wider society.**
- **In June 1999, the BIA published a Code of Best Practice to ensure consistency in the way in which biotechnology companies communicate information about new developments to a range of stakeholders including patients.**

Biotechnology is an innovative science that will benefit human beings and the environment. Advances in biotechnology will revolutionise the way disease is prevented, diagnosed and treated. Biotechnology is already helping to increase standards of healthcare, improve food production, make industrial processes more environmentally friendly and clean up pollution.



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Summary

Courtesy of Birkbeck College
Senate House, headquarters of the federal
University of London

1. Realising Biotech's Potential

- The UK biotech industry is among the strongest in the world, and significant advances have been made, but future growth is likely to be hampered by lack of investment and heavy tax liabilities.
- The UK sector needs a 'soft loans' scheme like that pioneered in Germany, where private funding is matched by Government investment.
- New companies who have floated on the Stock Exchange need help to compete in a global market.

2. Research Without Fear: Animal Testing

- Employees and shareholders of companies which carry out legitimate animal testing of medicines must be protected from harassment; without this, the UK faces losing its science base to other markets and life-saving medical research will be delayed.
- Intimidatory and violent behaviour such as threatening letters and protests outside people's homes must be outlawed.

3. Educating the Future: Encouraging a UK skills base for biotech

- The biotech industry needs world-class university research on which to build its products.
- The industry needs high-quality, well-trained science graduates and postgraduates to maintain the sector and move it forward.

4. Cell Nuclear Replacement (CNR)

- Stem cell research using cell nuclear replacement (CNR) has enormous potential for the future treatment of degenerative diseases such as Parkinson's.
- The BIA supports the UK ban on human reproductive cloning and calls for this ban to be extended throughout Europe.

5. Gene Patenting

- Without patents there would be no new medicines, since no company could afford to carry out expensive research and development without protection from plagiarists.
- Patent law should not discriminate against inventions resulting from genetics research.
- The primary objective of patenting is to encourage invention, innovation and the development of business and industry whilst allowing wider audiences to benefit from the new knowledge. A patent does not confer any right of ownership on the thing being patented.

6. Taking Research Forward: Bio Manufacturing

- After the discovery stage, bio companies need to manufacture and develop products.
- Unless the bio development stage is encouraged, the UK bio sector will disappear.
- The Government needs to halt the loss of pharmaceutical manufacturing from the UK.

MEDICAL ADVANCES

What can it do?	How does it work?	Where does it lead?
Improve quality of life through better diagnosis of disease	Biotechnology can detect the genes which dictate a person's predisposition to certain diseases.	This could provide an early warning system that can help that person avoid the risk factors which might bring on the disease as well as indicate the point at which treatment, if needed, will be most effective.
Enable life-saving medicines and diagnostic processes to be developed	Biotechnology is critical to the production of many lifesaving medicines as well as playing an important part in the research process for discovering new medicines and diagnostics.	These days, most discovery, testing and manufacture of medicines now involves biotechnology.
Help people with diabetes	Biotechnology was used to provide insulin for diabetics by injecting the gene for insulin into bacteria, turning them into insulin producers. This allowed insulin to be collected and purified for use by diabetic patients.	Other hormones and medicinal substances are now being produced in this way.
Treat heart disease patients	Biotechnology has enabled people suffering from heart disease to benefit from new heart valves. These are transplanted from specially bred pigs.	
Prevent rabies	Biotechnology has been used to create a vaccine which can mimic the effect of the rabies virus.	This stimulates an animal into creating antibodies which confer immunity.
Make safer vaccines	Biotechnology vaccines are made solely of antigen – a foreign substance that provokes a response from the immune system.	By isolating antigens and producing them in the laboratory, it is possible to make new vaccines which do not transmit the virus itself.
DNA testing	Biotechnology was used to develop DNA testing to establish paternity by comparing the DNA patterns of the mother, child and alleged father.	By eliminating the matching sequences of the mother and child from the child's DNA fingerprint, a comparison can be made between what is left and the DNA fingerprint of the alleged father. DNA testing was used to develop the genetic fingerprinting techniques used for identifying individuals, particularly in the fight against crime.
Biotech Biocatalysts	Biocatalysts make complex chemicals which are widely used in many current drugs and which are expected to play a major part in drug development.	Drugs will become more targeted on specific diseases with fewer side effects. In addition, the cost of the drug will be very low.

Introduction

UK Biotechnology

Biotechnology is science's new frontier. As Prime Minister Tony Blair said in a recent speech to the BIA, 'Biotechnology will be as important to the first half of the 21st century as computers were to the second half of the 20th century.'

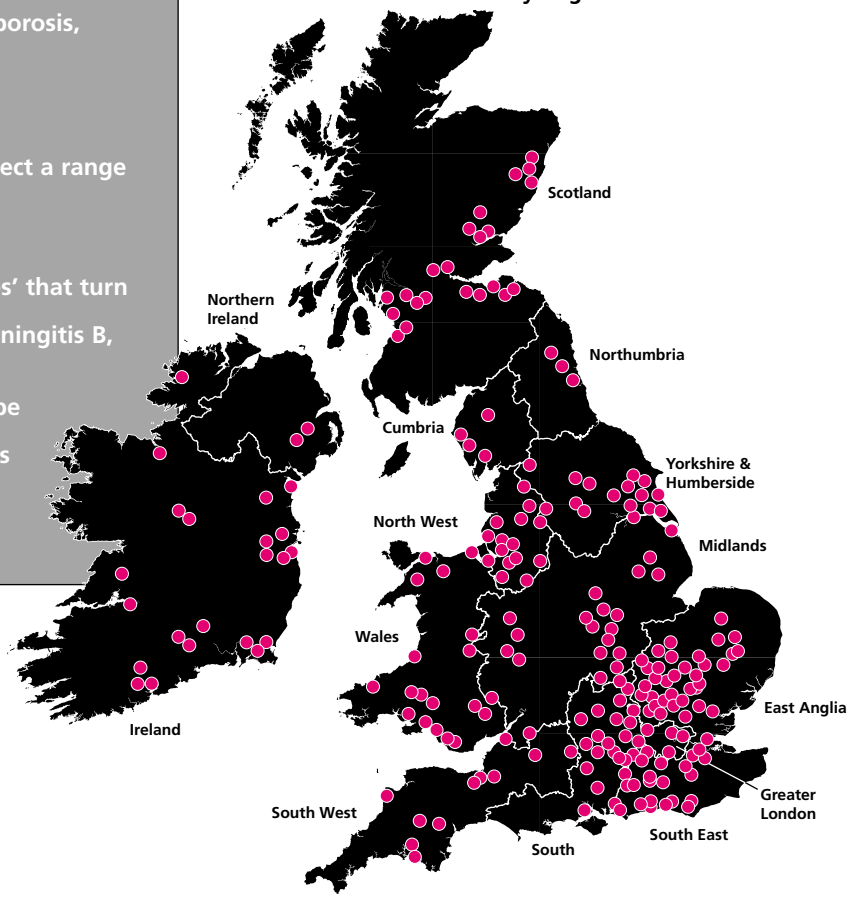
Scientific Advances

Biotech can improve food production and it can help to clean up our environment. But it is in medicine that the full potential is being realised today. In the past few months alone, the number of breakthroughs in the medical field has been increasing.

Recent developments in biotechnology include:

- A new diagnostic test for osteoporosis,
- A potato vaccine for hepatitis B,
- A simple blood test that can detect a range of cancers,
- The discovery of 'virulence genes' that turn harmless bugs into the killer Meningitis B,
- Stem cell research offers the hope of cures in degenerative diseases like diabetes and Parkinson's Disease.

Distribution of biotech companies in the UK by Region 1999



Economic Importance

Biotechnology is recognised as the next wave of the knowledge economy – the market in Europe alone is expected to be worth over US$100 billion by 2005. Britain is a leading centre of bioscience research in Europe, building on the nation's world class science base and successful pharmaceutical industry. The biotechnology industry is one of the fastest growing industries in the UK, with employment expanding at over 20% annually. By 2005, there could be as many as three million employed in Europe in biotech and associated companies: 'high skilled, wealth creating jobs'. The biotech industry has the potential to provide employment for millions of people in the UK, making it one of the most important emerging markets of our generation.

In all, the UK bioscience sector currently accounts for:

- **Almost a quarter of the European industry,**
- **Over half of publicly quoted European bioscience companies.**

Three-quarters of the biotechnology drugs in late stage clinical trials in Europe are produced by British companies. The giants of UK biotechnology, like Celltech, dominate the continent. It is vital that investment and careful regulation allow us to maintain our lead in this area.

Courtesy of The Stock Exchange

1. Realising Biotech's Potential

'The UK biotech sector is a success story, but we need a level playing field. To continue that success we need the same investment and tax incentives that other countries are giving to their own biotech sectors.' – **Daniel Abrams,** *Chief Financial Officer, Xenova Group and Chairman of the BIA Finance and Taxation Committee*

A successful biotech sector needs the following:

- **A strong scientific research base,**
- **Mechanisms for business start-up and finances to develop such businesses, land and planning consent,**
- **Flexible rental agreements,**
- **Incentives for employees and senior managers to prevent 'brain drain',**
- **Vocal Government support.**

Scientific research must lead to marketable products. Bringing products to market involves clinical trials (which involve animal testing), manufacturing and marketing.

The early stages of development, such as research and development, trials and manufacturing, must be supported.

Helping Start Up Companies

The BIA is calling for a 'soft loans' scheme similar to that pioneered by the German government, in which the government provides the initial seed capital to start-up companies plus long-term loans. A similar scheme would be welcomed by the UK industry, and would be a 'kick-start' to the growth and profitability of the sector.

Policy Recommendation

- **Under this scheme, venture capitalists would put up money for young companies, thereby providing due diligence to support Government loans. Government would match with soft loans structured to produce up to 3:1 matching of venture capitalist funds.**
- **Biotechnology is already a highly-regulated industry. These existing regulations will help the Government to ensure that the scheme is credible and reliable.**

The size of the government support must be sufficient to ensure that international biotech investors will choose the UK.

The aim of the 'soft loans' scheme is to create a UK biotech sector that is world-class, creates substantial wealth for the economy and is a major employer. Without such help at these early stages of the sector, this is unlikely to happen.

Helping companies grow in a global market

It is not just start-up companies which require help. Even companies who make it past the start up stage and manage to float on the Stock Market find themselves struggling to compete as a small new entrant to a complex and well-established marketplace. This prevents them carrying out fully effective research and development, and inhibits the growth of the sector. It is often five or ten years after they are first listed on the Stock Exchange before a company can start to generate positive revenues from its business. During this period, many companies need to raise further capital to finance vital research. To help such companies survive during this crucial period, the BIA wishes to see the following:

Policy Recommendation

- **Extended tax capital gains tax taper relief for investors after one year in new capital issues.**
- **The recently-introduced Capital Gains Tax taper relief scheme, available to employees of a company, should be extended to include private investors participating in a Placing or Public Offer capital raising exercise by a biotechnology company.**
- **This concession would be available to private investors in technology funds which in turn invest in listed biotechnology companies.**

This scheme would be an incentive to private investors to hold the shares for at least a mid-term period in order that they can access the taper relief on the Capital Gains Tax liability (thereby reducing the rate from 40% to 10% over a four-year period). Such a scheme would revitalise investment in the sector and increase liquidity. It would also create a more stable shareholder base.

Attracting and Retaining Key Employees

1. Reduction of National Insurance Contributions on Stock Options

Most UK biotech companies cannot afford to pay their managers salaries which compete with those which they could earn in the US. To make up for this discrepancy, companies often grant stock options in lieu of portions of salary. However, such stock options carry a heavy tax liability both for the employer and the employee which can negate the advantage of being able to pay non-cash remuneration.

The charge made on employers to pay National Insurance on employee stock options gives rise to a liability which may hang over the company's head for many years. Recently, companies have been allowed to cap their liability to that indicated by their 7 November 2000 share price. However, this means that they must immediately make an up-front payment. The result is that companies will have to pay National Insurance Contributions on options that may never be exercised, either because the employee leaves or the company fails. In addition, the sharp fall in biotech share prices since 7 November means that even this measure is problematic.

Policy Recommendation

- **The liability for National Insurance Contributions on employee stock options should be re-assessed to take account of the recent fall in the stockmarket value of such shares.**

2. Taxation of employee share options

Share options are an important incentive within the biotech industry and enable UK companies to compete internationally. While existing tax-privileged schemes offer a favourable tax treatment, those schemes are excessively restrictive. In particular, the restriction of the Enterprise Management Incentive Scheme to smaller companies, and the limit of £30,000 for options under the Company Share Option Plan impose restrictions which do not reflect the requirements of the growing biotech company. The additional burden of National Insurance Contributions, referred to above, make it particularly important that companies should be able to offer more generous options under approved schemes, where NICS are not payable.

Policy Recommendation

- **The limit of £30,000 under Company Share Option Plans should be increased, and the time limits on the exercise of options relaxed.**

ADVANCES IN FOOD PRODUCTION

What can it do?	How does it work?	Where does it lead?
Reduce pesticide use in food production	Biotechnology can be used to make plants resistant to disease, enabling production of better quality food.	By selecting plants that show natural resistance to a particular disease and carefully breeding them, new plants can be produced that are immune to disease in their natural habitat.
Improve the flavour and keeping qualities of food	Biotechnology can build on the knowledge of traditional plant breeders to produce enzymes which can be used to produce food which doesn't need to be enhanced with chemical flavours or preservatives.	Bread baking, beer brewing and wine fermentation have involved biotechnology for thousands of years – modern methods used in biotechnology are adding to this knowledge in a more precise and targeted way.

2. Research Without Fear

Animal Testing

'At HLS we have proudly and overtly demonstrated we shall not be intimidated. But in so doing we have placed our hopes in the belief that the government will protect its citizens and enable them to go about their jobs, free from the fear for their lives generated by a small bunch of extremists.

Brian Cass, *Managing Director, Huntingdon Life Sciences, a BIA member.*

Courtesy of RDS Understanding Animal Research in Medicine

The BIA supports the commitment by industry, scientists and government towards the principle of the 'three R's': Reduction, Refinement and Replacement, which aim to reduce the number of animals used in medical research, limit as far as possible the degree of pain, suffering and distress they may experience, and to work towards the replacement of animals in testing procedures.

Without animal testing we would not have any new treatments for disease. Despite this fact, a number of biotechnology companies have suffered harassment and even physical attacks by animal extremists. The BIA supports the right of every citizen to protest in a non-violent, democratic way. However, the tactics used by animal rights extremists recently have gone far beyond the bounds of legitimate protest.

Why do we use animals in medical research?

The use of animals in medical research has allowed researchers to make great advances in our understanding of human health and disease and develop new treatments. Animals are needed to examine possible effects occurring in the whole body, rather than in isolated cells or cultures.

What has animal testing achieved?

Without animal testing we would not have organ transplants or bone marrow transplants, for example, or treatments for epilepsy. Animal testing has also played a vital role in progress towards treatments for cancer. Stopping animal testing will halt progress towards cures for diseases such as cancer, Alzheimer's disease and diabetes.

The law on animal testing

Animal testing is required by law. The Government demands the safety testing of medicines on animals under the 1986 Animal (Scientific Procedures) Act. This law is widely regarded as the strictest law on animal testing in the world and grants permission to conduct research using animals only where there are no alternatives.

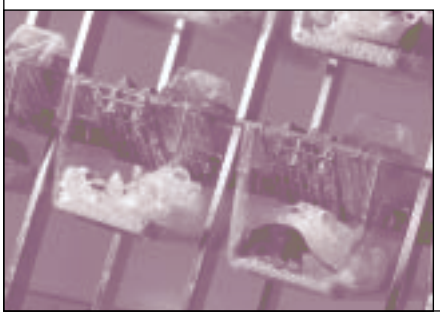
The 1986 Act aims to ensure that studies are well designed so that as few animals as possible are needed. In addition to controlling the use of animals it ensures that the principles of good animal welfare are closely observed in the rearing and handling of all animals used for research purposes. Home Office inspectors are empowered to make regular spot checks of all premises carrying out animal testing in order to ensure that welfare standards are maintained.

Recent Developments

The BIA welcomes the Government's recent actions, such as tabling an amendment to the Criminal Justice and Police Bill to allow private addresses of directors at serious risk of violence to be kept on a secure register. We welcome the statements from parliamentarians of all parties condemning violent animal rights activism and recognising the importance to human health of research using animals.

However, although important changes have been made, a number of issues still need to be addressed.

It is common for activists to purchase one or two shares in a company which gives them rights of access for inspection purposes to certain books, registers and documents for restricted periods during business hours. There is an obligation to particularise other directorships. This means that an individual who holds a number of directorships may be traced to their home address using the publicly-held details of their other companies.



Courtesy of Huntingdon Life Sciences

Local police forces often lack the resources to police animal rights activism effectively. In addition, many local forces lack the authorisation to pursue activists across county borders.

Policy Recommendation

- **Steps must be taken to ensure that directors' addresses cannot be accessed in this way by those who intend to harm or intimidate them.**
- **Shareholders' home addresses should not be made available to the general public.**
- **Protests at people's homes should be banned.**
- **Existing legislation covering incitement and conspiracy to harass should be reviewed to ensure that it covers the tactics used by animal rights activists.**
- **It should be an offence to organise a campaign purely in an attempt to cause the demise of a perfectly legitimate business.**
- **Policing of animal rights protests should cross county boundaries.**
- **Central funding is needed to help local police forces tackle animal rights activism.**

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3. Educating the Future:

Encouraging a UK skills base for biotech

The competitive strength of the UK bioscience industry depends on its people. Highly-skilled individuals create intellectual property and build the biotech applications of the future. They are also vital to the success of the bioscience sector, which needs such people to drive its growth. The excellence of the research in UK universities attracts investment and technology transfer from the university to industry. This in turn creates jobs and allows the sector to grow.

Young scientists entering the biotech industry need practical skills as well as scientific ones, including IT competence, communications ability and presentation skills. To ensure that biotechnology in the UK is successful and achieves future growth, it needs the following:

- **A university science base of global quality.**
- **A willingness from the universities to understand the needs of the bioscience sector and to respond to and fulfil those needs.**
- **Research Councils need to be able to identify key areas of research that are of relevance to the industry and to encourage such research.**
- **Appropriately-trained graduates who are also committed to lifelong learning.**

Industry has difficulty in recruiting enough high-quality researchers. Many graduates and postgraduates lack training in practical skills which are essential in industry. In addition, there is a shortage of individuals with the regulatory skills required by the sector, such as patent professionals, technology transfer executives and clinical trial managers. Whereas the USA, Canada and Germany have an immigration policy which allows their industries to recruit such people from elsewhere, UK companies can find it difficult to recruit skilled individuals from outside the country.

Courtesy of Cantab Pharmaceuticals plc

Policy Recommendation

SCHOOLS

- Current schemes to encourage qualified science graduates to enter teaching should be maintained.
- Industry and Government should review the provision of careers advice to schools relating to science careers.

UNIVERSITIES

- The DfEE should continue to encourage universities to work closely with industry to identify their needs and requirements in designing/amending courses. Flexibility of course design is important.
- Industry and academia need to increase their skills and competence sharing schemes.
- The Government should provide further long-term support for Higher Education Institutions, including the provision of up-to-date equipment in university laboratories.
- There needs to be more industry-specified modular courses developed by a consortium of universities. These courses would be available to the employees of small and medium-sized businesses, who could access them to keep their training and knowledge up to date.
- Government, industry and the research community should investigate the viability of the establishment and maintenance of whole animal pharmacology courses in the UK.

INDUSTRY

- There needs to be a further review of the immigration regulations inhibiting the employment by the industry of overseas specialist R&D experts in the UK.
- Current schemes which encourage links between industry and universities should be reviewed and simplified to ensure their greater effectiveness.

3. Cell Nuclear Replacement (CNR)

The recent free vote by the House of Commons and the House of Lords to allow stem cell research into degenerative diseases to take place was a breakthrough for scientific research and offers hope to thousands of people suffering from degenerative disorders such as Parkinson's Disease and diabetes.

Stem cell research offers new opportunities for the treatment of a wide range of degenerative diseases, but research with very early stage human embryos will be needed to make these new therapies a reality for patients. The aim of such research is to find ways of reprogramming cells **without** using human eggs and embryos. Research on human embryos using cell nuclear replacement will be needed to test if the patients' own cells can be 'reprogrammed' and so avoid the problem associated with immune rejection. Embryo research already takes place under strict regulatory conditions in the UK, including reviews of all research proposals by the Human Fertilisation and Embryology Authority.

The BIA and the UK biotech industry is totally opposed to human reproductive cloning.

Policy Recommendation

- **We fully support the UK government's plan to introduce further legislation to strengthen the UK's existing ban on human reproductive cloning, and we call on governments across Europe to do the same.**

4. Gene Patenting

'Patents promote the development of cures for diseases' – **Andrew Sheard,** *Chairman of the BIA's Intellectual Property Committee.*

What is a patent?

A patent can be obtained by an inventor to protect his or her invention from unlicensed commercial competition. To be patentable an invention has to be **novel**, involve an **inventive step**, be **industrially applicable**, and be something whose patentability is not contrary to statute. For example, statute does not permit inventions whose exploitation is contrary to morality to be patented. The "protection" conferred by a patent is merely the right to stop others commercialising the invention without permission. A patent does not confer any right of ownership on the thing being patented.

The importance of patents

The patent system is fundamental in fostering the motives necessary for the advancement of technology – the development of scientific advance into benefits for patients and other consumers. The system encourages developments which will bring medical and therapeutic benefits and, eventually, improve the quality of human life.

If patents were not available, drug companies would be unable to make the major investment – estimated at £340 million per drug – to develop new cures.

Encouraging public information

Patents force information to be made publicly available and allow it to be used in related research. Without patents, the work of scientists would not be protected, encouraging a culture of secrecy within the scientific community.

Can patents be applied to genes?

Genes *in situ* in the body are not patentable, but artificial copies of genes isolated from the body may be – but only when, or if, they meet the requirements of novelty, inventive step and industrial applicability.

Without an effective patent system, fewer medical advances would reach patients.

ENVIRONMENTAL ADVANCES

What can it do?	How does it work?	Where does it lead?
Improve the sustainability of industrial processes by making them more efficient.	Microorganisms and enzymes can catalyse many important chemical reactions producing higher yields using less energy and generating less waste.	A greener chemical industry with opportunities for creating new compounds with improved or novel properties through bioinformatics.
Reduce industrial pollution	Bioreactors, biofilters, reedbeds, etc convert liquid, solid and gaseous industrial emissions to harmless products.	An immediate decrease in emissions of many of the most ubiquitous pollutants (such as VOCs) from existing industrial plant.
Clean-up the legacy of industrial activity	Brownfield sites can be returned to the land stock by stimulating environmentally-friendly degradative processes	An ecologically sound, sustainable method of recovering land for most purposes
Clean-up oil spills	Naturally occurring microbes can degrade oil spills, protecting natural ecosystems	At Bulwell bay in Pembroke, bioremediation was used as the first line of defence against oil from the Sea Empress disaster. The sheltered shore in this area would have prevented dispersion of the oil by the natural movement of the sea
Avoid the use of hazardous chemicals	Enzymes have replaced cyanide and formaldehyde in the manufacture of indigo dye, the world's largest dye product.	New methods enable indigo to be made from glucose, similar to way it is produced naturally in plants
Reduce water consumption	Developments such as membrane bioreactors enable the construction of efficient, fully-enclosed, small-footprint industrial and domestic waste water treatment plants	Water consumption by industry can be greatly reduced by on-site recycling. Odourless, enclosed sewage treatment works can be sited nearer to housing.
Detect toxic chemicals or biological contamination	Enzyme, antibody or microbial biosensors enable chemical or biological contamination to be detected and mapped enabling precision remedial action.	Optimal management of, for example, contaminated land

What about making drugs available to the developing world?

Patents allow inventors of drugs limited control over their invention for a limited period, but they are not a block to the availability of drugs in the developing world. Without patents, we would not have the cures for AIDS and other diseases which are now being made available. Drug delivery in poor countries needs to take place in a wider context of improvements to the social and healthcare systems in those countries. The BIA is keen to take part in the debate on the implications of intellectual property law in the developing world, and how expensive, high-technology drugs can be made available to the poorest and neediest.

Policy Recommendation

- **The patent system should not discriminate against inventions relating to human genetics.**

Taking Research Forward

Bio-manufacturing

Research and development in industry leads to the development of products which need to be manufactured on a larger scale and brought to the market. Manufacturing, and the associated process and analytical development skills, are critical to the successful commercialisation and timely development of biotechnology products. There is a danger that biotech products which have been researched in the UK may be manufactured elsewhere, losing a considerable part of the value and employment chain from the UK. Furthermore, this represents an area of biotechnology where the UK has leading capabilities in industry and academia. Properly harnessed, these capabilities can underpin a growing, international business with major export potential servicing other countries' biotechnology research centres.

Policy Recommendation

- **Government should encourage investment in the large-scale manufacturing of biotech products that are available under contract arrangements.**
- **Further commitment is needed to the training and development of individuals with expertise in process and analytical skills which are critical for excellence in biotech manufacturing.**
- **There is a need to expand the underpinning training programmes in the UK for manufacturing technologies, especially for operations to pharmaceutical standards and levels of compliance.**
- **Small startup biotech companies should be helped to understand, plan for and address their manufacturing needs in a timely way.**

Small early-stage biotech companies have particular difficulty during the manufacturing stage. Biopharma goods are often costly, and are difficult to manufacture. The manufacturing process is especially critical to the safety of biotech products, and the long timescale of investment in biotech manufacturing can delay commercialisation of the product.

Policy Recommendation

- **Industry and Government should work together to create two or three UK Centres focused on biotech development and manufacturing.**

These Centres would be supported by industry and the universities, and would be helped by Government grants or loans, together with tax incentives and assistance towards running costs. The Centres would link up individuals with process and analytical skills in order to help manufacture products to the first clinical trials stage, and provide process research and development.

- **Government should offer grants or loans to help early-stage UK biotech companies address their early process development and manufacturing needs.**
- **These funds could be matched with company funds to focus on building UK centres of manufacturing excellence.**

Government support for early-stage biotech manufacturing encourages companies to plan and invest appropriately for the success of their business. Such support energises the market and encourages investment, and also enables new companies to learn by doing. In addition, such a schemes would enable an industry-government partnership on biotech manufacturing. Industry would action any Government schemes and would conduct regular national manufacturing needs surveys.

Conclusion

UK Biotech: a World-class Sector in 2010?

'Britain started this industry in the early 1980s. My vision for 2005 is for the UK to be the life sciences hub of Europe, and the bridge between the European and US healthcare markets. Britain already leads Europe in the application of the biosciences. Britain must also lead in the ethical debate of its use.' – **Dr Paul Drayson,** *Chairman of the BIA*

The enormous importance of biotechnology lies in its ability to increase our understanding of living organisms in their healthy and unhealthy state, and the way in which they interact with other organisms and with the environment. Biotechnology is above all a science about the understanding of natural processes, and the use of such processes to help human beings and the environment.

Biotechnology has led to a much improved understanding of the biological interactions that are involved in the treatment of disease, in food production and industrial production. It has opened up the possibility of designing more sustainable solutions that will have significantly less impact on the environment than previous industrial processes.

50% of the world's diseases still have no cure. Yet, over the next twenty years, biotechnology will offer us ways of heading off the mass-killers in our society such as cancer, heart disease and diabetes. Illnesses as feared by our generation as polio and diphtheria were feared by our grand-parents. Thanks to biotechnology, we are now developing vaccines against AIDS and malaria.

Biotechnology is also a potent new weapon against degenerative diseases like Alzheimer's and Parkinson's that currently cost the NHS hundreds of millions of pounds in long-term care. So not only can people expect to live longer, they will also lead healthier lives.

UK scientists and companies are in the vanguard of the biotech revolution. But to harness the full potential of this new technology for the benefit of human beings and the environment, the sector needs to work with the media, the public, the financial community and policy-makers to publicise the benefits of biotechnology and to put in place the kind of financial and legislative measures which will allow it to flourish.

The BIA and our members have the opportunity to make Britain the life sciences hub of Europe, to fight back against the killer diseases that have plagued mankind for centuries and to offer future generations the prospect of an active old age. To do this, we will need to gain the public's support, and we recognise that our priority is to earn that support.

About the BIA

The BioIndustry Association (BIA) is the trade association for innovative, emerging small to medium sized enterprises (SMEs) in the UK's bioscience sector.

Established in 1989, the BIA's mission is to encourage and promote a thriving, financially sound sector of the UK economy, built upon developments across the biosciences, to create economic growth, employment and an expanding skills base. There are over 550 bioscience companies operating in the UK employing over 40,000 people.

The BIA has over 350 members, the majority of which are involved in realising the human health benefits that biotechnology promises. It represents the interests of these innovative companies to a broad section of stakeholders from patient groups to politicians, advancing its members' interests nationally and internationally to maintain a healthy UK bioscience sector.

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