



Plant potential in the pipeline

An international group of scientists will today reveal how plants can provide alternative sources of raw materials for our future energy, fuel and everyday products. The FP6 EPOBIO project is releasing its first series of reports on the endless possibilities of plants.

The renewable revolution

EPOBIO Director Professor Dianna Bowles said “Two key threats to society are our dependence on finite fossil fuels and climate change. Plants have the potential to provide us with everything now made using petroleum. In this way, we can create a sustainable society for the future and address immediate concerns such as rising energy costs, security of supply and our impact on the environment.”

The EPOBIO project, funded under the European Commission’s ‘Integrating and strengthening the ERA’ programme of FP6, provides the science to support policy decisions to realise the economic potential of sustainable resources from non-food crops. With dwindling fossil fuel resources, supply issues and the environmental impact of carbon dioxide emissions, alternative materials are required to sustain our lifestyles.

The reports issued today present detailed analyses of plant-based products in areas which offer the greatest benefit to society and could be achieved in as little as 10-15 years time. The project focuses on three ‘flagship’ areas - biopolymers, plant oils and the use of plant cell walls in biorefining.

Key issues highlighted in the reports are:

Biopolymers - the need for alternative sources of natural rubber:

- natural rubber is a strategic commodity, irreplaceable by synthetic alternatives for many of its applications, e.g. heavy duty tyres for SUVs, trucks and aeroplanes.
- the incidence of allergic reactions to proteins in natural rubber (latex) is increasing. Natural rubber is used to make protective medical products, posing a potential risk to both patients and medical workers.
- the rubber tree, *Hevea brasiliensis*, is at risk from a fungal disease which has already decimated large-scale rubber production in South America.
- future shortages in supply are predicted
- the rubber-producing shrub, guayule, can be grown in Europe as an alternative source of non-allergenic natural rubber.

Plant oils - the potential of producing lubricants from plants:

- plant oils have similar structures and properties to mineral oils and can be used as replacements in many applications which now use mineral oil.
- wax esters have excellent properties as lubricants but their use has previously been limited by the high cost of extraction from jojoba seeds.
- the low cost production of wax esters from the non-food oil crop *Crambe abyssinica* will provide a sustainable supply of lubricants to use in engine, transmission and hydraulic fluids.

Plant cell walls - the potential of using plants as an energy and industrial feedstock supply:

- biofuels, power, chemicals, materials and fibres can be all made from plants rather than oil in integrated processing systems called biorefineries.
- the use of plant material reduces greenhouse gas emissions while guaranteeing security of supply.
- plant material and processing methods need to be optimised so that material can be more easily extracted in order to increase yield and quality of the end products and reduce energy and chemical inputs.

The use of plants in these ways can contribute to a number of EU policies including climate change targets to reduce greenhouse gas emissions, the expansion of the use of biofuels and the delivery of sustainable development. New opportunities for the agriculture sector, in the context of the reformed and market-focussed CAP, will help the economic stability of agriculture, support the rural infrastructure and provide new job and income opportunities.

EPOBIO involves an international partnership between experts in plant science, environmental impact assessment, economic analysis and social expectations. Through the production of these and future reports, EPOBIO will establish the evidence-base required for the successful development of bio-based, renewable products to benefit society.

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Editor Notes:

1. Full versions of the reports and executive summaries are available to download from www.epobio.net, along with further supporting information and images.
Biopolymers flagship report - Alternative sources of natural rubber
Plant Cell Walls flagship report - Cell wall saccharification
Plant Oils flagship report - Production of wax esters in *Crambe*
2. Contact details for press information:

EPOBIO Director	Professor Dianna Bowles Director, CNAP, University of York	e-mail: djb32@york.ac.uk tel: +44 (0)1904 328780
EPOBIO Co-ordinator	David Clayton CNAP, University of York	e-mail: dc530@york.ac.uk tel: +44 (0)7795 315069
Biopolymers report author	Dr Jan van Beilen University of Lausanne, Switzerland	e-mail: vanbeilen@biotech.biol.ethz.ch tel: +41 (0)44 6333444

website: www.epobio.net
email: info@epobio.net
tel: +44 (0)1904 328761

Biopolymers project leader	Professor Yves Poirier Director, Department of Plant Molecular Biology, University of Lausanne, Switzerland	e-mail:yves.poirier@unil.ch tel: +41 (0)21 692 42 22
Plant Cell Walls report author	Dr Ralf Möller Max-Planck-Institute of Molecular Plant Physiology, Germany	e-mail: moeller@mpimp-golm.mpg.de tel: +49 (0)331 567 8263
Plant Cell Walls project leader	Professor Markus Pauly Max-Planck-Institute of Molecular Plant Physiology, Germany	e-mail: Pauly@mpimp-golm.mpg.de tel: +01 517 353 433
Plant Oils report author	Dr Anders Carlsson Swedish University of Agricultural Sciences	e-mail: anders.carlsson@vv.slu.se tel: +46 (0)40 415561
Plant Oils project leader	Professor Sten Stymne Department of Crop Science, Swedish University of Agricultural Sciences, Sweden	e-mail: sten.stymne@vv.slu.se tel: +46 (0)40 415519

3. EPOBIO stands for “realising the Economic Potential of sustainable resources - BIOproducts from Non-Food Crops.”
EPOBIO is an international project to realise the economic potential of plant-derived raw materials and establish the priorities for bioscience research in order to deliver bio-based products for the market place in 10-15 years. The EPOBIO project involves a consortium of 12 European and US partners and is led by the Centre for Novel Agricultural Products at the University of York, UK. The project is funded as part of the European Commission’s Sixth Framework Programme, receiving €1.4 million with co-operation from the United States Department of Agriculture.
4. EC-US Workshops of the Taskforce on Biotechnology Research during 2004 and 2005 prioritised key scientific themes (EPOBIO flagship themes) and technologies requiring the focus of international collaborations for delivery.
5. CNAP, the Centre for Novel Agricultural Products, is a research centre in the Department of Biology at the University of York and was established through a benefaction from the Garfield Weston Foundation and funding from UK Government. The University of York was awarded a Queen’s Anniversary Prize for Higher and Further Education in 2006 for its work in CNAP. The aim of CNAP’s research is to realise the potential of plant- and microbial-based renewable resources through gene discovery to make products needed by society. CNAP research in plant and microbial sciences is supported by the UK Research Councils, particularly the Biotechnology and Biological Sciences Research Council (BBSRC), as well as the DTI and DEFRA, and funding from European and US organisations.
6. For general enquires about EPOBIO, please contact Dr Louisa Wright on +44 (0)1904 328802 or +44 (0)7795 315036, e-mail: lw15@york.ac.uk. For general enquiries about the University of York, please contact David Garner on +44 (0)1904 432153, University of York Communications Office.