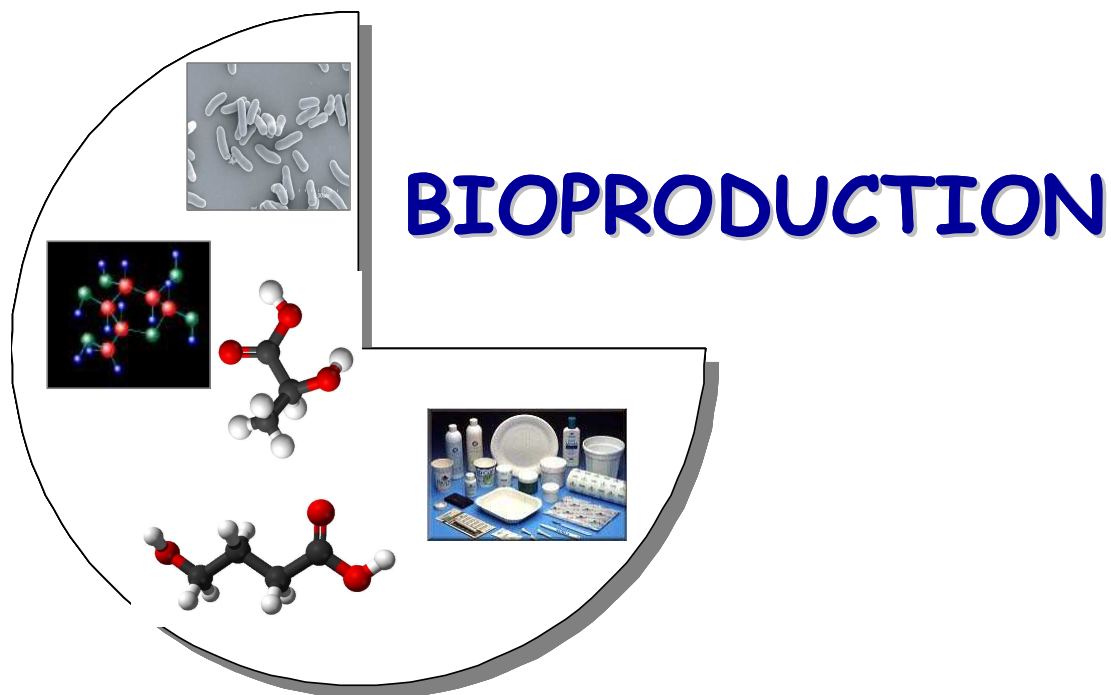




CLOSING EVENT

INTEGRATED PROJECT

"SUSTAINABLE MICROBIAL AND BIOCATALYTIC
PRODUCTION OF ADVANCED FUNCTIONAL
MATERIALS"



BIOPRODUCTION

December 10th, 2010

**Procter & Gamble BIC center,
Strombeek-Bever (Brussels, Belgium)**

Technical Theme:

"Benefits from biotechnology towards sustainable solutions to industrial processes"

Summary of BIOPRODUCTION IP

Industrial biotechnology, alternatively known as “**white biotechnology**”, is the modern use and application of biotechnology for the sustainable processing and production of chemicals, materials and fuels. Biotechnology uses enzymes and microorganisms to make products in sectors such as fine and bulk chemicals, pharmaceuticals, food and feed, paper and pulp, textiles, energy, materials and polymers.

The BIOPRODUCTION IP integrated the scientific activities and complementary skills of more than one hundred researchers coming from 14 EU-countries working in the field of industrial biotechnology.

The present IP has built an industrial R&D platform in **sustainable production of functional bioproducts** (e.g., lactic acid- and PHA-based polyesters, chitosan and alginate biopolymers, polysaccharide-based biosurfactants, chiral (*R*) hydroxyalkanoic acids and other biobased building blocks) entirely made from **renewable sources**. The project focused on the utilization of a combination of renewable (agri)industrial sources and wastes as raw materials and **biological processes** (fermentation, biocatalysis) for the production of high-added value specialty bioproducts for “**niche**” applications. In line with these objectives and with the notion of small-scale, advanced, highly-responsive flexible manufacturing facilities for the production of new, low-tonnage, high-added value products (“**factories of the future**”) developments and radical innovations over the following fields were pursued:

- **Novel biocatalysts:** exploration of native/manipulated microorganisms for the low-cost production of a wide spectrum of enzymes with tailored substrate specificity, thermal stability and optimum pH. Use of bioinformatics in design of specific enzyme targets. Improvement of enzyme stability and catalytic efficiency using immobilization technologies. Biocatalysis in organic media.
- **Advanced fermentation and bioproduction processes** for enhancing naturally occurring pathways to generate intermediates and PHA biopolymers and for the exploitation of cheap nutrients (e.g., renewable and waste carbon sources) and/or improvement of product yield through genetic modifications of bacterial strains and/or the implementation of integrated bioreactor configurations.
- **Bio-based building blocks:** design of clean process alternative for the production of pure L-(+)-isomer of lactic acid based on zero-cost recycled paper sludge (RPS) substrate and sustainable biotechnological process for the production of novel chiral (*R*) hydroxyalkanoic acids, exhibiting antimicrobial, insecticidal, and antiviral activities.
- **Functional biomaterials:** Considerable commercial opportunities will result by the introduction to the market (i) of highly efficient bioactive and bio-functional alginates for chronic wounds healing, (ii) of high quality chitosan biopolymer products for healthcare nutrition and cosmetic applications, (iii) of biodegradable poly(lactic acid) (PLA) as versatile biomedical materials for surgical sutures, artificial skin, tissue scaffolds, drugs carriers, and (iv) of completely biodegradable polysaccharide-based biosurfactants that will replace the current petroleum based surface-active products in food, agriculture, cosmetic, and detergent applications.

The joint efforts and co-operation between different partners representing a variety of research fields has contributed to the wide-open dissemination of R&D results and their industrial exploitation as expressed in the notion of the ERA.

Partners Involved

The BIOPRODUCTION IP integrated the scientific activities and complementary skills of more than one hundred researchers coming from 14 EU-countries. The Consortium consists of 7 SMEs, 4 large companies, 6 research centres and 8 university departments.

Centre for Research and Technology Hellas / Chemical Process Engineering Research Institute	CERTH/CPERI		GREECE
KitoZyme SA	KitoZyme		BELGIUM
Procter & Gamble	P&G		BELGIUM
Hycail Finland Oy	HYCAIL		FINLAND
Artes Biotechnology GmbH	ARTES		GERMANY
AlgiPharma	AlgiPharma		NORWAY
Companhia Petroquímica do Barreiro S.A.	CPB		PORTUGAL
University of Newcastle, Newcastle upon Tyne	UNEW		UK
BIOMEDAL S.L.	BIOMEDAL		SPAIN
BIOPOLIS S.L.	BIOPOLIS		SPAIN
IMenz Bioengineering BV	IMenz		THE NETHERLANDS
BASF	BASF		UK
The Centre for Process Innovation	CPI		UK
DWI an der RWTH Aachen e.V.	DWI/RWTH		GERMANY
Deutsches Wollforschungsinstitut an der RWTH Aachen e.V.	DWI/RWTH		GERMANY
Istituto di Ricerca Protos	PROTOS		ITALY
Consejo Superior De Investigaciones Científicas - Centro De Investigaciones Biológicas	CSIC-CIB		SPAIN
Instituto de Ciencia e Tecnologia de Polimeros	ICTPOL		PORTUGAL
Food & Biobased Research/ Stichting Dienst Landbouwkundig Onderzoek	DLO		THE NETHERLANDS
Institute of Chemical Technology Prague	ICT Prague		CZECH REPUBLIC
Technical University of Denmark	DTU		DENMARK
Université de Strasbourg	UDS		FRANCE
University of Stuttgart	UST		GERMANY
Universidad del Pais Vasco	UPV/EHU		SPAIN
Royal Institute of Technology (Kungliga Tekniska Högskolan)	KTH		SWEDEN
University of Liege	Ulg		BELGIUM

Event Agenda

Conference Opening

- 09:00-09:30 Welcome from P&G representative
Welcome from EC representative
Welcome from project Coordinator
Overview of the BIOPRODUCTION IP

SESSION I: MICROBIAL AND ENZYMIC PROCESSES

Chair:

- 09:30-09:50 Alginate epimerases – production of enzymes with highly repetitive structure in the yeast *Hansenula polymorpha*
ARTES Germany
- 09:50-10:10 Production of novel robust biocatalysts for enzymic degradation of PHAs
CSIC-CIB Spain, *UPV/EHU* Spain, *BIOMEDAL* Spain
- 10:10-10:30 Bio-production of polyesters and co-polyesters
ICTPOL Portugal, *CERTH/CPERI* Greece, *BIOPOLIS* Spain, *UDS* France, *ULG* Belgium
- 10:30-11:00 *Coffee Break and Poster Session*

SESSION II: DIGITAL BIOPROCESSES

Chair:

- 11:00-11:20 From sequence to function: molecular modeling and design of biocatalysts
UST Germany, *DLO* The Netherlands
- 11:20-11:40 Microbial production of biopolymers: In-silico modeling, monitoring, optimization and control
CERTH/CPERI Greece, *UNEW* UK, *CPI* UK, *ICT-Prague*, Czech Republic, *ICTPOL* Portugal

SESSION III: LUNCH AND POSTER SESSION

11:40-14:00 *Poster Session - Lunch Break*

SESSION IV: INTERMEDIATES - BIOBASED BUILDING BLOCKS

Chair:

- 14:00-14:20 Lactic Acid Production from Refuse Paper Sludge
ICTPOL, Portugal, *IMenz*, The Netherlands, *DTU*, Denmark
- 14:20-14:40 Cyclic and linear building blocks from renewable resources by biocatalytic routes.
DLO The Netherlands, *DWI/RWTH* Germany, *UPV/EHU* Spain

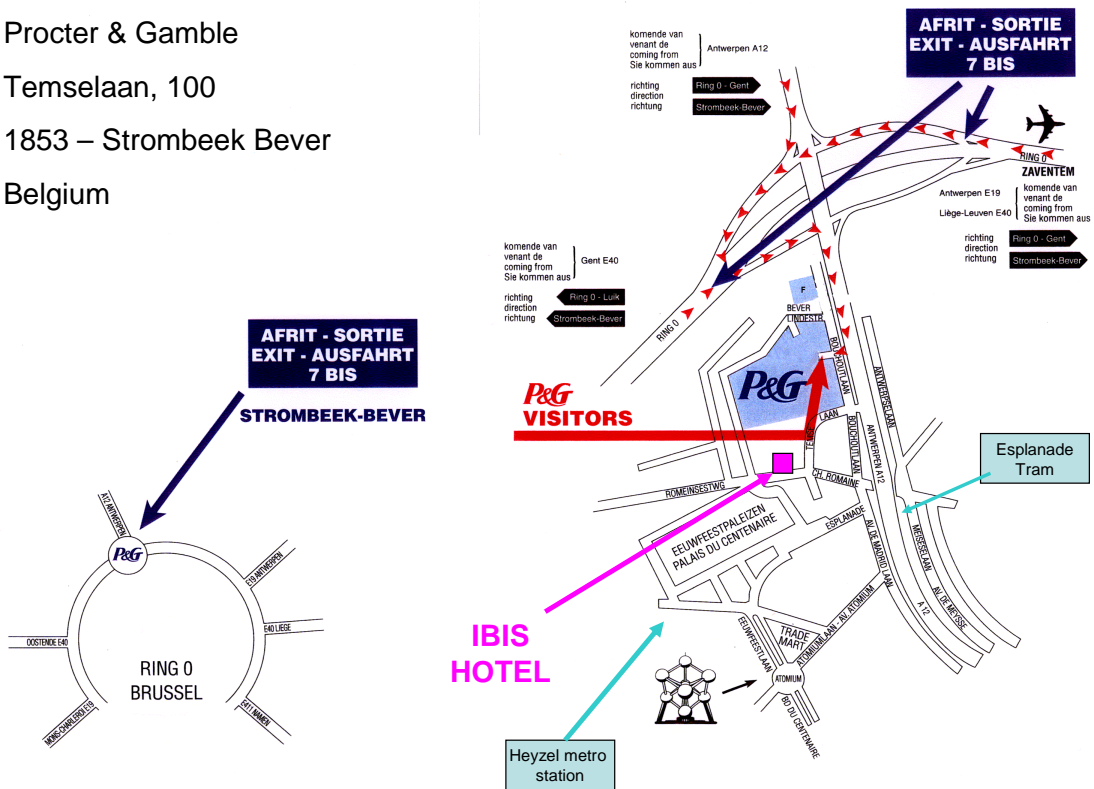
SESSION V: ADVANCED FUNCTIONAL BIOMATERIALS

Chair:

- 14:40-15:00 Chitosan and its derivatives: Synthesis, characterization and applications
KitoZyme Belgium, DWI/RWTH Germany, UDS France
- 15:00-15:20 Design and tailoring of alginates with reference to medical and pharmaceutical applications
AlgiPharma Norway, ARTES Germany, IMenz The Netherlands
- 15:20-15:50 **Coffee Break and Poster Session***
- 15:50-16:10 SFAE as novel bio-based non-ionic surfactants for laundry applications
P&G, Germany, PROTOS, Italy, CPI UK, DWI/RWTH Germany, DLO The Netherlands
- 16:10-16:30 On the synthesis of functional polyesters
DWI/RWTH Germany, DLO The Netherlands, BIOMEDAL, CERTH/CPERI Greece, KTH Sweden, DWI/RWTH Germany
- 16:30-17:00 Conclusions –Conference Closing**

Venue of the Event - Maps

Procter & Gamble
Temselaan, 100
1853 – Strombeek Bever
Belgium



Accommodation

We recommend Hilton Brussels City Hotel, located in Place Rogier 20, 1210 Brussels. Room reservation can be made using following link:

http://www.hilton.com/en/hi/groups/personalized/BRUPMHI-GPROM-20101207/index.jhtml?WT.mc_id=POG

A bus transfer is offered from the Hilton Hotel to the premises of P&G.

Registration

Please provide registration information (Full name, Organization, Address, Country, e-mail) to Dr. Sophia Parouti:

e-mail : parouti@cperi.certh.gr

Tel. : (+30) 2310 498179

There is no registration fee.