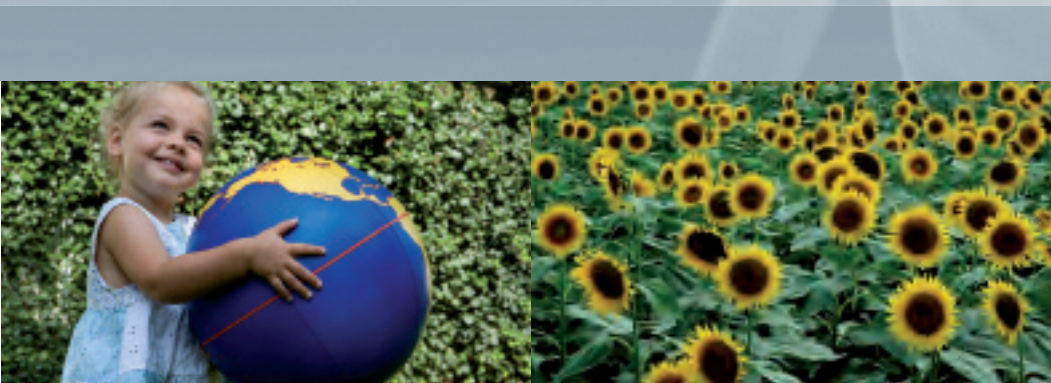


# interACTS

Volume 2 • no. 2 • 2007

interACTS is the official newsletter of Advanced Chemical Technologies for Sustainability (ACTS)



**Biomass: a battle we need to win**

**Second Phase ACTS Plan:  
ACTS means Business**

**Public-private partnership is necessary  
for successful innovation**

**ACTS**



## Welcome to interACTS!

This is already the third edition of interACTS, the official ACTS newsletter designed to keep you informed about the latest developments in Advanced Chemical Technologies for Sustainability (ACTS).

In the current issue you will find an outline of the main focal points of the Second Phase ACTS plan. This report aims to translate the formulated ACTS strategy into an output-driven plan for the near future of ACTS. If you are interested in receiving a hard copy of this Second Phase Plan please let us know.

An interesting interview is published with two key partners of the CatchBio consortium, our latest public-private initiative in the area of biomass conversion into usable and sustainable end products. CatchBio stands for Catalysis for sustainable chemicals from Biomass and has a total budget of 29 million euros. Of this amount, the government's SmartMix programme contributed more than 16 million euros. We are very proud to be able to start this groundbreaking programme.

In addition to this I would also like to draw your attention to the launch of the first call for proposals of the ACENET international cooperation programme. The topic of which is 'Innovative, sustainable catalytic processes with better energy and carbon efficiency'.

Last but not least you will find useful information on deadlines and coming events of the eight ACTS programmes.

Please do keep us informed with your suggestions for improvement via [interacts@acts.nl](mailto:interacts@acts.nl)

Dr Louis B.J. Vertegaal  
DIRECTOR ACTS & NWO CHEMICAL SCIENCES

## Bert Weckhuysen and Hans Gosselink on CatchBio

BY ELSKE KOOPMAN

**Bert Weckhuysen (38) is heading up the new research programme CatchBio. Hans Gosselink (53) is innovation manager for the programme. CatchBio is the acronym for Catalysis for sustainable chemicals from Biomass and develops new catalysts and the associated chemical processes for making fuels and chemicals from biomass.**

**The project is an initiative of the Dutch Institute for Catalysis Research (NIOK), of which the Utrecht professor Weckhuysen is the scientific director. Gosselink works at Shell Global Solutions in Amsterdam as Regional Manager Innovation & Research. Weckhuysen and Gosselink together with many other Dutch catalysis researchers wrote the CatchBio proposal. Via the government's SmartMix programme that led to a subsidy of more than 16 million euros. With the participant's contributions the total budget is 29 million euros.**

**Colofon** • interACTS is the official newsletter of Advanced Chemical Technologies for Sustainability (ACTS) – Volume 2 nr 2 2007  
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Are you interested in receiving interACTS or do you want to give suggestions? Please send an email to [interacts@nwo.nl](mailto:interacts@nwo.nl).

# Biomass: a battle we need to win



CatchBio



**CatchBio** Catalysis for sustainable chemicals from Biomass

**Size** M€ 29

**Duration** 2007-2015

## Aim

Biomass is the sustainable alternative for fossil fuels. CatchBio aims to develop clean and efficient processes for biomass conversion into cheap biofuels, chemicals and pharmaceuticals and will contribute to the reduction of greenhouse gas emissions.

## Partners

Utrecht University, University of Amsterdam, Delft University of Technology, University of Twente, Leiden University, Radboud University Nijmegen, Eindhoven University of Technology, University of Groningen, Energy Research Centre of the Netherlands (ECN), Wageningen Agrotechnology and Food Innovations, Shell Global Solutions, DSM Research, Dow Benelux, Sabic Petrochemicals, BASF Netherlands, Organon, Sasol Technology, Avantium, Albemarle Catalysts, BIOeCON, Hybrid Catalysis and Vibspec.

## Aim

We want to develop sustainable and efficient chemocatalytic processes based on biomass. We want to take the parts of plants not used in the food chain and convert these into products. That is more difficult than converting sugar into ethanol but we do not want to compete with the food industry', says Gosselink. 'You can see that problem in America where large 'Hummers' run on bioethanol made from corn whilst tortillas are becoming increasingly expensive. Biomass plays an important role in making our society more sustainable and we cannot lose this battle', says Weckhuysen. 'We will make catalytic tools for this and develop chemical processes around these', adds Gosselink.

## Cooperation

The 23 partners in CatchBio are six large chemical companies, two catalyst companies, eight universities, two knowledge institutes and several smaller companies. 'Hans safeguards the industrial interests and I the academic so that we maintain a balance', says Weckhuysen.

University groups have been working with the chemical industry for a long time on the development of new catalytic technologies. 'That mostly happens on a one-to-one basis and not on this scale', says Weckhuysen. CatchBio makes use of ACTS' knowledge of public-private partnerships. 'We hire in the expertise, but it is an independent programme', says the professor. The large scale offers advantages. According to Gosselink industry helps in determining the fundamental questions about biorefining.

## Passion

The two work on CatchBio in addition to their normal work. Research is a passion for both of them. They have not had an argument yet. Telephone discussions during the weekend and on public holidays have, however, taken place. Gosselink receives time

from Shell for the programme. 'Yet in this type of study you never have enough time', says Gosselink. Weckhuysen endorses that. The Belgian has now worked for seven years in Utrecht after Leuven, America and Leuven again. 'I was offered a professorship here when I was 31', says Weckhuysen. He now lives in the Netherlands and has a Dutch partner. Sometimes he misses the Belgian Sunday baker. Gosselink has worked as a researcher at Shell for 25 years. His oldest son is studying chemistry at Utrecht University and is also working on catalytic processes. His second son is studying human movement sciences and the youngest is still at high school.

## Output

Weckhuysen expects that besides many interesting research results CatchBio will also yield about 30 patents, but not immediately. 'More important still is that we make about 50 young researchers enthusiastic for biomass. They can later use this knowledge in the commercial sector'. In principle the subsidy is for a period of eight years, but the process will last for much longer.

## Everyday practice

'The developments with crude oil last already for at least fifty years. Even one hundred', adds Gosselink. Together they draw a diagram on a whiteboard with a sort of family tree. Instead of oil tankers that arrive in the harbour with the crude oil to be refined, farmers will soon have to collect biomass. Small processing plants might then be built to handle this process locally. One problem is that biomass contains a lot of oxygen that has to be disposed of. 'However, in the case of crude oil, oxygen is added to make specific basic chemicals and so the catalytic processes involved are completely different', says Weckhuysen. "Biofuels must also be usable in the current generation of engines because not everyone can or will want to buy a new car straightaway.'



Second Phase ACTS Plan:

# ACTS means Business

**In 2006, ACTS consulted its stakeholders about the course to be followed by ACTS in the period 2007–2011. This resulted in the plan for the second phase of ACTS that was adopted by the Supervisory Board in February and published in June 2007. The title, ACTS means Business, refers to the main theme for the second phase: converting knowledge into tangible contributions to innovation at companies and in society. The title also indicates that ACTS takes this task seriously. The first ACTS conference in December 2006, at which the innovation options of the ACTS programmes were presented and demonstrated, bore the same title.**

The mission of ACTS is to generate options for innovation in the areas of chemistry, life sciences and technology in which catalysis plays a key role and where a positive contribution to sustainability is the common purpose. The foundation laid by ACTS during the first phase of its existence (2002–2006) provides an excellent starting point to further extend the available knowledge, technology and expertise and to translate this into concrete contributions to economic growth and a sustainable society.

The Second Phase Plan describes how ACTS will realise a maximum amount of innovation options. ACTS also calls for the strengthening of the Innovation Lab concept. Innovation Labs stimulate the development of successful university research projects into commercial applications. ACTS will try to secure additional funding for this concept so that it can reach its full potential. Further ACTS will pay more attention to the contribution project results make to sustainability. Finally, ACTS will focus on high-quality scientific education related to the ACTS programmes and education in the area of facilitating innovations.

In the international arena European collaboration will play an important role. The cooperation built up within the ERA-NETs ACENET and ERA-IB will be used in forthcoming years to set up new joint European initiatives in the areas of applied catalysis and industrial biotechnology. For this ACTS will continue to cooperate with the European Technology Platform Sustainable Chemistry.

ACTS has set itself the objective of ensuring that the knowledge, experience, networks and expertise acquired in ACTS will be used in the future for new innovation-focussed programmes in the areas of sustainable chemistry, life sciences and technology. The CatchBio programme is the first example of this. Together with its stakeholders, ACTS will establish whether new programmes are necessary to deal with the challenges society and the chemistry sector will face in the area of sustainability over the next few decades.

The Second Phase Plan will be distributed to all stakeholders. If you wish to receive a copy, please send an e-mail request to: [acts@nwo.nl](mailto:acts@nwo.nl).



# News on the ACTS programmes



## IBOS

**The IBOS programme (Integration of Biosynthesis & Organic Synthesis) aims to realise a change of strategy in synthetic chemistry by integrating organic chemistry, modern biochemistry (e.g. enzymes) and biotechnology (e.g. pathway engineering). With this a new and sustainable future is foreseen for the more efficient industrial synthesis of increasingly complex products, together with a drastic reduction in waste products and energy consumption.**

**For further information see: [www.nwo.nl/acts/ibos](http://www.nwo.nl/acts/ibos).**

In April 2007 four research proposals were granted in the second call for proposals. Projects are collaborations between university groups with industry and were judged to be of high quality. In the call for SME proposals, which was held in parallel, five 2 year-postdoc projects were granted. In each project, an SME (Dutch acronym MKB) participates with an 'in kind' contribution of at most 22% of the total research budget (max. 67% of the total SME contribution), consisting of in-house research efforts. Due to the success of this call, a second SME call will be launched this summer. The exact deadline for submitting proposals will be announced in the call (October/November 2007).

On 27 and 28 September 2007, the 5th IBOS Conference will be held in Nunspeet.

## ASPECT

**The Advanced Sustainable Processes by Engaging Catalytic Technologies (ASPECT) programme focuses on catalytic chemical processes in bulk chemistry. Its medium and long-term ambitions are to enhance the sustainability of these processes. A joint effort between universities and industry is required to enhance sustainability.**

**For further information see: [www.nwo.nl/acts/aspect](http://www.nwo.nl/acts/aspect).**

The evaluation procedure for ASPECT's second call for proposals was concluded with the granting of two projects in addition to the eight projects that had already been granted just before Christmas. Together with the eleven projects that were granted in the first round, the ASPECT programme now has 21 projects covering all three themes of the ASPECT programme: Innovative Tools; Engineering & Efficiency Improvements and Alternative Feedstocks.

Results obtained in the project "From liquid bio feed to bulk chemicals: a rational approach based on liquid-phase in-situ spectroscopy" of Prof. Weckhuysen (UU) have led to the first patent application within the ASPECT programme. Results in the project "Spectroscopic control of heterogeneously catalyzed processes" (Bennici, Vogelaar, Nijhuis and Weckhuysen) will be published in *Angewandte Chemie* (see ACTS Output on page 9).

In June the fifth ASPECT programme meeting will take place where in-depth discussions will be held between the academic and industrial partners within ASPECT.

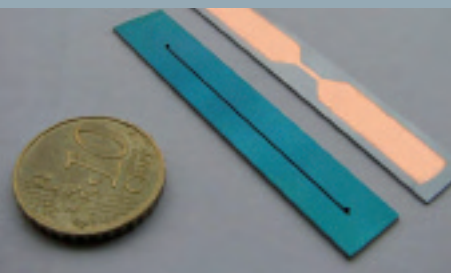
## Sustainable Hydrogen

**The Sustainable Hydrogen programme aims to develop the knowledge and technology concepts that will enable the transition from fossil fuels to renewable sources (clean fuel). The programme is divided into seven research themes, which cover both technological and non-technological issues. The first few concern the production, separation, storage, transport and conversion of hydrogen. The non-technological issues cover the societal, social, psychological, economic and governance aspects of the introduction of hydrogen into our energy systems.**

**For further information see: [www.nwo.nl/acts/h2](http://www.nwo.nl/acts/h2).**

The Sustainable Hydrogen second call for proposals is now in progress. International peers are evaluating the projects submitted. An announcement of the funded projects is expected in October 2007.

The Sustainable Hydrogen Programme Committee organised a Second Educational Workshop on 24 and 25 May 2007 in Golden Tulip De Beyaerd in Hulshorst. The ACTS Sustainable Hydrogen programme has been set up to address in an integrated manner all of the important scientific, technological and societal issues that must be solved before a 'Hydrogen Economy' can become reality. The topics of the programme therefore span a very wide range of disciplines. In this workshop tutorial lectures were given at a level adapted to a broad audience. Topics discussed were, for instance: diffusion of hydrogen into metals, hydrogen in nanostructure materials, climate change, and the commercialisation of fuel cells.



LEFT: PHOTO OF THE CHIP COMPONENTS; ONE PART HAS A FLUID CHANNEL THE OTHER A COPPER 'WIRE' THAT GENERATES AND DETECTS THE NMR SIGNALS. THESE COMPONENTS THEN NEED TO BE JOINED TOGETHER TO CLOSE OFF THE CHANNEL.



## PoaC

**The PoaC programme (Process on a Chip) aims to support new topological concepts developed for the initiation of novel production processes in the areas of food technology, chemistry and life sciences. The interdisciplinary PoaC programme forms a bridge between chemistry and microsystem technology. The programme addresses three key challenges: basic expertise, analysis on a chip, and synthesis on a chip.**

**For further information see: [www.nwo.nl/acts/poac](http://www.nwo.nl/acts/poac).**

The second PoaC call for proposals, in which approximately 10 PhD projects can be funded, is launched by the end of June 2007. The application procedure consists of a pre-proposal stage and a full proposal stage. The proposals can be submitted by tenured researchers of all Dutch universities and GTIs. The latest details on the call can be checked on [www.nwo.nl/acts/poac](http://www.nwo.nl/acts/poac).

One of the six current PoaC projects, "Versatile micro-NMR", is a collaboration between the Solid-State NMR chair of Arno Kentgens (Radboud University Nijmegen), and the recently installed personal chair Mesoscale Chemical Systems, led by Han Gardeniers (University of Twente). In this project microreactor chips will be developed in which chemical reactions can be followed on-line, using nuclear magnetic resonance. In conventional methods excitation and detection of the magnetic signals is done with a coil, which surrounds the sample. Here a different concept is studied, namely the use of a wire around which a magnetic field for excitation and detection of the resonance is generated. The field is confined to the sample area by enclosing it in a micro-Faraday cage. It is expected that this concept will allow for higher signal-to-noise ratio and improved spectral resolution, and in the end also may enable the development of a real table-top NMR system.

## B-Basic

**B-Basic (Bio-based Sustainable Industrial Chemistry) is an NWO-ACTS research consortium in which Dutch universities, research institutes and industry cooperate to achieve a sustainable future in the field of bio-based chemicals. Bio-based industrial production of chemicals, often referred to as industrial biotechnology, is the controlled use of microbial cell factories such as yeast for the efficient production of desired products, using cheap,**

**renewable feedstocks and advanced biotechnology.**

**For further information see: [www.b-basic.nl](http://www.b-basic.nl).**

The B-Basic programme held its second confidential symposium on 10 and 11 May 2007. At this meeting, PhD students and postdocs presented and discussed their results with other researchers and experts from industry. The conference was opened by a stimulating lecture on biofuels and innovation through partnerships by Peter Lednor (Shell). Cooperation between the B-Basic researchers was enhanced by means of a 'KNEX' bridge building workshop in which innovation was put into practice.

During this symposium Wouter van Winden (Delft University of Technology) and Leo Vleugels (DSM) received the Leo-Petrus Innovation Trophy. In their joint project they are developing a pioneering production method to make biodiesel out of algae that brings the financial feasibility of such a process a step closer. The winners received € 100,000 to kick off the implementation of their idea. The jury, composed of representatives from Akzo Nobel, Shell and DSM, was full of praise for the winning idea. One of their reasons for selecting this proposal was that both the product and the process are sustainable. Additionally the idea brings together expertise from different areas in a surprising way.

## ACENET

**The ACENET ERA-NET (Applied Catalysis European Network) has been set up with the aim of better structuring and enhancing the coordination and cooperation between twelve national funding and research management organisations, in ten European countries, connected with research programmes in the European research area of Applied Catalysis and related sustainable chemical research.**

**For further information see: [www.acenet.net](http://www.acenet.net).**

Two courses in the ACENET framework for transnational postgraduate courses and continuing professional development in Applied Catalysis are scheduled for the upcoming period. The Continuous Professional Development course 'Industrial catalytic processes' will take place from 15 to 20 April 2007 at the University of Bath (United Kingdom). The course is particularly interesting for chemists and chemical engineers who have 1 to 4 years experience working in catalysis and are working in industry and universities. ACENET launched its first jointly coordinated European call





for proposals in the field of Applied Catalysis on 2 May 2007. The call is entitled 'Innovative, sustainable catalytic processes with better energy and carbon efficiency' and aims to establish public-private partnerships on a European level. Researchers in catalysis are invited to tender projects provided that these have the potential for innovative, industrial application and that a minimum of three to a maximum of five eligible organisations participate in the project, with no more than one similar kind of organisation per country. Researchers of Dutch organisations (project coordinators and co-applicants) could send a brief programme outline to the VIRAN office by 29 May to obtain a letter of support of VIRAN for the event that industries within VIRAN are interested in the proposed project. The chairman of VIRAN is taking part in the Programme Committee that will advise the ACENET Executive Board about the selection of pre-proposals. More details of the call can be found on the ACENET website under the item '1st Call'.

The Irish Research Council for Science, Engineering and Technology has requested to become a partner in ACENET and to participate in the call for proposals as well. The ACENET consortium is delighted with this request and has welcomed the Irish as partner. As a result the network currently unites twelve research management and funding organisations from ten EU Member States.

## ERA-IB

**Sixteen research organisations from twelve European countries have joined forces to form the ERA Industrial Biotechnology network (ERA-IB). The cooperation must result in a harmonisation of the currently fragmented national research policies, the implementation of a joint strategy and coordination of new international research programmes in the area of industrial biotechnology. ACTS is one of the founders of ERA-IB and is also the coordinator of the project. For further information see our new website: [www.era-ib.net](http://www.era-ib.net)**

In March 2007 ERA-IB had a poster presentation at the fifth Stakeholder meeting of the European Technology Platform for Sustainable Chemistry. At this meeting, the final Implementation Action Plan was presented. The role and value of national SusChem platforms was also featured, as well as a poster session on the work of SusChem, relevant ERAnets and other Technology Platforms.

ERA-IB further intensified its collaboration with EuropaBio. The two will collaborate in areas such as making an inventory of industrial demands and wishes in the area of IB, organising workshops and outreach meetings and a European joint call for proposals.

The first ERA-IB satellite meeting will be held on Friday 19 October 2007 in Brussels, following the symposium on Renewable Raw Materials for Industry organised by the European Renewable Raw Materials Association. At this satellite meeting researchers and industrial representatives working in industrial biotechnology in Europe will get together to discuss the next steps within the ERA-NET, including plans for a joint call for proposals.

## TAIWAN

**The joint Taiwan-Netherlands programme on Catalysis aims to stimulate excellent scientific research by fostering collaborations between research groups who can mutually benefit from each other's expertise. Projects in this programme take place in both the Netherlands and Taiwan and focus on research in homogeneous, heterogeneous and biocatalysis.**

**For further information see: [www.nwo.nl/acts/taiwan](http://www.nwo.nl/acts/taiwan).**

On 9 March – immediately after the Netherlands Catalysis and Chemistry Conference NCCC VII – the kick-off meeting of the Joint Taiwan-Netherlands programme took place in Delft. All project leaders, PhD students and postdocs who will participate in the programme got together to exchange ideas and plans for the joint projects. They were welcomed by Joseph Hsu, director-general of the NSC Science and Technology division of the Taipei Representative Office of the EU and by Louis Vertegaal, director of ACTS. The programme further consisted of presentations on the three projects and visits to the labs.

The kick-off meeting marked the start of the three projects within the programme, that will take place in both the Netherlands and Taiwan. Extended stays of the researchers in the partner's lab are foreseen. Subsequent joint meetings are planned at the halfway point and at the end of the programme.

## ACTS Output

### Articles

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#### ■ Sustainable Hydrogen

C. P. Baldé, B.P.C. Hereijgers, J. H. Bitter, K. P. de Jong, 'Facilitated Hydrogen storage over supported  $\text{NaAlH}_4$ ' *Angew. Chem. Int. Ed.*, 45, 3501-3503 (2006).

M.J. van Setten, M.A. Uijttewaai, G.A. de Wijs, R.A. de Groot, 'Thermodynamic stability of boron: the role of defects and zero point motion', *Journal of the American Chemical Society* 129, 2458-2465 (2007).

#### ■ ASPECT

Simona M. Bennici, Bas M. Vogelaar, T. Alexander Nijhuis, Bert M. Weckhuysen  
'Real-time control of a catalytic solid in a fixed bed reactor based on in-situ spectroscopy', *Angew. Chem. Int. Ed.* in press.

#### ■ IBOS

Martijn Huibers, Alvaro Manuzi, Floris P.J.T. Rutjes, Floris L. van Delft, 'A sulfitylation-oxidation protocol for the preparation of sulfates', *J. Org. Chem.*, 71, 7473, (2006).

## ACTS Allocations

### ASPECT

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#### 2nd tender

Prof. dr. ir. L. Lefferts (UT), 'Oxidative dehydrogenation with  $\text{CO}_2$  as a soft oxidant'.

Dr. J. van Haveren, Prof. dr. ir. H.J. Heeres, Dr. ir. A.J.J. Straathof, Prof. dr. F. Kapteijn, Dr. U. Hanefeld  
Dr. IV Melian Cabrera, Mw. K. Djanashvili, 'Bulk Chemicals from glycerol; the development of selective oxidation and hydrogenolysis pathways'.

### IBOS

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#### SME-projects

Prof.dr. F.P.J.T Rutjes (RU), Prof.dr. J. van der Oost (WUR), Prof.dr. R. Wever (UvA) with Chiralix B.V. (Nijmegen), 'Enzymatic synthesis of enantio- and diastereomerically pure unsaturated  $\beta$ -hydroxy- $\alpha$ -amino acids and synthetic elaboration into biologically relevant derivatives'.

Dr. U. Hanefeld (TUD), Dr. R.V.A. Orru (VU) with CLEA Technologies B.V. (Delft), 'Combining Cross Linked Enzyme Aggregates with Multi-Component Reactions for the efficient preparation of fine chemicals'.

Prof. dr. F.P.J.T Rutjes (RU), Dr. F.L. van Delft (RU) with Syntarga B.V. (Nijmegen), 'Bio- and chemocatalytic approaches to potent anticancer duocarmycins'.

Prof. dr. H.J. Bouwmeester (WUR), Prof. dr. H.J. Bosch (WUR), Dr. M.C.R. Franssen (WUR) with Dafra Pharma (Turnhout), Industrial chicory as fine-chemical production platform

Prof. dr. R. Verpoorte (UL), Prof.dr. J.J. Memelink (UL), dr. A.E. Schulte (UL) with Prosenza B.V. (Leiden), 'Plants as cell factories'.

#### SME-projects

Prof. dr. I.J. van der Klei (RUG), Prof. dr. A.J.M. Driesssen (RUG), Prof. dr. J.T. Pronk (TUD), Prof. dr. ir. J.J. Heijnen (TUD), 'A cell factory for the biosynthesis of complex peptides (CELLPEP)'.

Prof. dr. F.P.J.T Rutjes (RU), Dr. M.C.R. Franssen (WUR), Prof.dr. J. van der Oost (WUR), Prof. dr. R. Wever (UvA), 'Industrially relevant heterocycles through biocatalytic cascades'.

Dr. ir. M.W. Fraaije (RUG), Dr. W.J.H. van Berkel (WUR), Prof. dr. L. Dijkhuizen (RUG), Prof. dr. N.P.E. Vermeulen (VU), 'Biocatalytic exploitation of monooxygenases (BIOMOX)'.

Prof. dr. D.B. Janssen (RUG), Prof.dr. F.P.J.T Rutjes (RU), Prof. dr. J. Tramper (WUR), 'Chemoenzymatic peptide synthesis'.

# Public-private partnership is necessary for successful innovation



Joost Holthuis is CEO of OctoPlus, a public-listed biopharmaceutical company which he cofounded in 1995. He is, amongst other things, joint chair of the board of the Netherlands Biotechnology Association (NIABA), member of the Regiegroep Chemie, member of the executive board of the foundation Top Institute Pharma, and a member of the board of the Advisory Committee Innovation Subsidy Partnership Projects of the Dutch Ministry of Economic Affairs. His academic career started in Leiden with a Master's Degree in Pharmacy in 1980. After obtaining his PhD in 1985, he worked as an assistant professor at Utrecht University and published more than 50 peer-reviewed scientific publications.

**Dr. J.J.M. Holthuis**  
CEO OF OCTOPLUS

Outstanding research is carried out in the Netherlands and knowledge is being generated in areas such as the life sciences. However, the development of new commerce, products, applications and productivity increases on the basis of new knowledge is lagging behind that of other countries and therefore needs to be improved in the Netherlands. Companies can no longer innovate alone as the technological developments are happening too quickly and no single company can keep up with all relevant developments. The future success of industry is therefore, in part, dependent on the cooperation with knowledge institutes and other companies. If we want to catch up in the Netherlands, there will need to be greater and improved cooperation between knowledge institutes, companies and the government with the purpose of making the knowledge generated applicable/market ripe as soon as possible.

That certainly does not mean that knowledge institutes need to concern themselves for example with product development, but they do have the obligation to protect the knowledge generated and to preferably make this available to Dutch companies. If the technology or product becomes a commercial success then the knowledge institutes should be rewarded for their efforts at the market rate. This reward must be seen as supplementary to adequate direct government funding used to finance independent pure scientific research.

A good partnership between the commercial sectors and knowledge institutes is in the interest of society as a whole. The government's task is therefore to support innovative entrepreneurship and the cooperation between the commercial sector and knowledge institutes, preferably with a limited set of simple instruments. These instruments should be used for a longer period of time (e.g. 5-10 years) and must be given the chance to bear fruit. Over the past five years there have been too many changes in the instruments and the policy. That a consistent policy leads to excellent results can be seen from the approach in neighbouring Belgium with the VIB (Flanders Institute for Biotechnology), which recently celebrated its tenth anniversary.



Wout van Wijngaarden has worked in the area of stimulating innovation since 1992, in both the Netherlands and abroad. He currently works for SenterNovem, an agency of the Ministry of Economic Affairs. He recently set up the Smart Mix subsidy programme together with NWO. As the manager of the Knowledge Infrastructure team at SenterNovem, his responsibilities include the innovation programmes of the Ministry of Economic Affairs that focus on public-private partnership with the knowledge infrastructure, such as IOP and BSIK.

**Ir. W.L. van Wijngaarden MBA**  
MANAGER KNOWLEDGE INFRASTRUCTURE, SENTERNOVEM

I do Agree! Public-private partnership is necessary for innovation. An innovative and healthy economy is the basis for the sustainable development of our welfare. The Netherlands will have to keep on working at maintaining and strengthening its competitive position. Competitive strength is becoming increasingly dependent on innovative capacity and the extent to which the Netherlands is able to deliver added value and quality. Essential elements for this include: a well-educated and trained workforce and high-value knowledge and skills. That is the essence of pillar 2 from the government: an innovative, competitive and entrepreneurial economy.

A good partnership and exchange between universities, knowledge centres and the commercial sector will benefit the innovative capacity of our economy. Stand-alone innovation projects are often not enough to tackle the major technological and societal issues, such as the environment, and instead parties need to join forces in 'open innovation' partnerships. This involves combining internal and external sources such as knowledge, research facilities and capital to successfully develop and market innovations. The education system (with up-to-date curricula, meeting society's needs, and with attractive career paths) is an essential part of this as well, so as to ensure that the available knowledge is fully used.

The successes of public-private partnership in open innovation can already be seen in various areas in both the Netherlands and elsewhere. Such partnerships have also been used in the Dutch chemistry sector, for example with the BSIK project B-Basic and the SmartMix programme CatchBio. The societal issues with respect to the environment demand that, particularly within chemistry, these partnerships are further intensified both now and in the future!

# agenda

28–29 June 2007

## ASPECT

5th ASPECT (closed) conference

1-5 July 2007

## GSC-3

3rd International Conference on Green and Sustainable Chemistry  
1-5 July 2007, Delft, The Netherlands  
Department of Biotechnology, Delft University of Technology  
<http://www.greenchem2007.tudelft.nl/programme.html>

2 July 2007

## ACENET

Deadline submission pre-proposals of 1st ACENET call for proposals. See for further information: [www.acenet.net](http://www.acenet.net) (under 1st Call).

1 September 2007

## Casimir

Deadline for applications  
For further information see page 5

4 September 2007

## Rubicon

Deadline submission proposals  
The Rubicon programme gives young researchers a chance to enhance their career prospects by spending up to two years at a top research institution outside the Netherlands or one year at an excellent Dutch research institution. The Rubicon programme also offers talented researchers from abroad the opportunity to obtain grants to spend one year conducting research in the Netherlands.  
See for further information: [www.nwo.nl/rubicon](http://www.nwo.nl/rubicon)

27 and 28 September 2007

## IBOS

5th IBOS (closed) conference, Nunspeet

October/November 2007

## IBOS

Deadline submission of second call for SME proposals (see text of the call to be launched this summer for the exact date)

Autumn/winter 2007

## ACENET

ACENET Education Workshop on the requirements and possibilities of distance/e-learning.

Autumn/winter 2007

## ACENET

Workshop on the possibilities for future joint activities of ACENET to contribute to the reinforcement of the position of applied catalysis in Europe.

December 2007

## ASPECT

6th ASPECT (closed) conference

December 2007

## Rubicon

Deadline submission proposals

14 December 2007

## ACENET

Deadline submission full proposals of 1st ACENET call for proposals.



## Advanced Chemical Technologies for Sustainability (ACTS)

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