Program

Enzyme Engineering XXIV

September 24 - 28, 2017
Pierre Baudis Congress Center
Toulouse, France

Conference Co-Chairs

Pierre Monsan
Toulouse White Biotechnology, France

Magali Remaud-Simeon
LISBP-INSA, University of Toulouse, France

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Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

Enzyme Engineering Steering Committee

Previous conferences in this series:

Enzyme Engineering
August 9-13, 1971
New England College, Henniker, New Hampshire
Conference Chair:
L.B. Wingard, Jr., SUNY Buffalo

Enzyme Engineering II
August 5-10, 1973
New England College, Henniker, New Hampshire
Conference Chairs:
L. B. Wingard, Jr., University of Pittsburgh
E. K. Pye, University of Pennsylvania

Enzyme Engineering III
August 3-8, 1975
Reed College, Portland, Oregon
Conference Chairs:
E. K. Pye, University of Pennsylvania
Howard H. Weetall, Corning Glass Works

Enzyme Engineering IV
September 25–30, 1977
Bad Neuenahr, W. Germany
Conference Chairs:
G. Manecke, der Freie Universität Berlin
L. B. Wingard, Jr., University of Pittsburgh

Enzyme Engineering V
July 29-August 3, 1979
New England College, Henniker, New Hampshire
Conference Chairs:
Howard H. Weetall, Corning Glass Works
G. P. Royer, University of Delaware

Enzyme Engineering VI
September 20-26, 1981
Kashikojima, Japan
Conference Chairs:
S. Fukui, Kyoto University
I. Chibata, Tanabe Seiyaku Co.

Enzyme Engineering VII
September 25-30, 1983
White Haven, Pennsylvania
Conference Chair:
Allen I. Laskin, Exxon Research & Eng. Co.

Previous conferences in this series:

Enzyme Engineering VIII
September 22-27, 1985
Elsinor, Denmark
Conference Chair:
Klaus Mosbach, University of Lund

Enzyme Engineering IX
October 4-9, 1987
Santa Barbara, California
Conference Chairs:
Harvey W. Blanch, University of California, Berkeley
Alexander M. Klibanov, Massachusetts Institute of Technology

Enzyme Engineering X
September 24-29, 1989
Kashikojima, Japan
Conference Chair:
H. Okada, University of Osaka

Enzyme Engineering XI
September 22-27, 1991
Kona, Hawaii
Conference Chairs:
David A. Estell, Genencor
Douglas S. Clark, University of California, Berkeley

Enzyme Engineering XII
September 19-24, 1993
Deauville, France
Conference Chairs:
Daniel Thomas, University of Technology of Compiègne
Marie Dominique Legoy, University of Technology of Compiègne

Enzyme Engineering XIII
October 15-20, 1995
San Diego, California
Conference Chairs:
Jon Dordick, University of Iowa
Alan Russell, University of Pittsburgh

Enzyme Engineering XIV
October 12-17, 1997
Beijing, China
Conference Chairs:
Yao-Ting Yu, Nankai University
Gao-Xiang Li, Academia Sinica

Previous conferences in this series:

Enzyme Engineering XV
October 10-15, 1999
Kailua-Kona, Hawaii
Conference Chairs:
David Anton, DuPont
Frances H. Arnold, California Institute of Technology
Robert Kelly, North Carolina State University

Enzyme Engineering XVI
October 7-12, 2001
Potsdam, Germany
Conference Chairs:
Frieder W. Scheller, University of Potsdam
Christian Wandrey, Research Center Jülich
Oreste Ghisalba, Novartis Pharma AG

Enzyme Engineering XVII
November 9-14, 2003
Santa Fe, New Mexico
Conference Chairs:
Stephen Benkovic, Pennsylvania State University
Chi-Huey Wong, Scripps Research Institute
Jeffrey Moore, Merck & Co., Inc.
Birgit Kosjek, Merck & Co., Inc.

Enzyme Engineering XVIII
October 9-14, 2005
Gyeong-ju, Korea
Conference Chairs:
Hak-Sung Kim, KAIST, Korea
Ji-Yong Song, LG Life Sciences, Ltd, Korea
Tae-Kwang Oh, Korea Research Inst.of Biosciences & Biotech, Korea
Moon-Hee Sung, Kookmin University, Korea

Enzyme Engineering XIX
September 23-28, 2007
British Columbia, Canada
Conference Chairs:
Romas Kazlauskas, University of Minnesota
Stefan Lutz, Emory University
David Estell, Danisco/Genencor

Enzyme Engineering XX
September 20-24, 2009
Groningen, the Netherlands
Conference Chairs:
Dick Janssen, University of Groningen
Oliver May, DSM Pharmaceutical Products
Andreas Bommarius, Georgia Institute of Technology

Previous conferences in this series:

Enzyme Engineering XXI
September 18-22, 2011
Vail, Colorado
Conference Chairs:
Lori Giver, Codexis
Steve Withers, University of British Columbia

Enzyme Engineering XXII
September 22-26, 2013
Toyama, Japan
Conference Chairs:
Yasuhisa Asano, Toyama Prefectural University
Jun Ogawa, Kyoto University
Yoshihiko Yasohara, Keneka Corp.

Enzyme Engineering XXIII
September 6-11, 2015
St. Petersburg, Florida, USA
Conference Chairs:
Jon Dale Stewart, University of Florida
Robert DiCosimo, DuPont Industrial Biosciences

PIERRE MONSAN TO RECEIVE THE 2017 ENZYME ENGINEERING AWARD

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Since 1983 the Enzyme Engineering Award has been presented at ECI's biennial International Enzyme Engineering Conference. The 2017 Award will be presented at the 24th Enzyme Engineering Conference in Toulouse, France. This award recognizes outstanding achievement in the field of enzyme engineering, through basic or applied research in academia or industry.

The 2017 Enzyme Engineering Award, presented in the name of Engineering Conferences International and Genencor, will be awarded to **Professor Pierre Monsan**.

Professor Pierre Monsan earned his engineering degree in Biological Chemistry (1969) from the National Institute for Applied Sciences (INSA), University of Toulouse, France, as well as his Doctor-Engineer Degree (1971) and his PhD degree (1977). He obtained a Lecturer position in the Department of Biochemical Engineering at INSA in 1969, and was promoted Assistant Professor in 1973 and Full Professor in 1981.

He founded one of the very first French start-up companies, BioEurope, focusing on the field of Biocatalysis in 1984. In 1993, BioEurope merged with the Solabia Group. He returned to INSA to create the Gilbert Durand Bioengineering Center and to start a new research group focusing on enzyme molecular engineering with Prof. Magali Remaud-Simeon. He was appointed Professor at Ecole des Mines Paris in 1993. He was involved in the creation of BioTrade in 1996 and of GeniBio in 1998. From 1999 to 2004 he headed the Department of Biochemical Engineering at INSA. He was elected member of the French University Institute (IUF) in 2003 and re-elected in 2008. He founded Toulouse White Biotechnology (TWB) in 2012 with a €20m grant from the French Government. He is presently Professor Emeritus at INSA and Director of TWB.

Professor Monsan has made many significant contributions to the field of enzyme engineering. His early work was on enzyme immobilization and enzyme reactor development. He elucidated the mechanism of action of glutaraldehyde, one of the most widely used reagents for enzyme covalent binding. In the late 70s, he was one of the very first researchers to use enzymes in non-aqueous

media to “transform” hydrolytic enzymes into synthetic enzymes for ester, amide and glycosidic linkage synthesis. His group at INSA has made very significant contributions to the field of glucansucrases, including:

(i) the isolation of totally original genes which enable such enzymes to catalyze the synthesis of oligosaccharides, polysaccharides and glucoconjugates using the simple sucrose molecule as an α-D-glucosyl moiety donor,
(ii) the deciphering of their molecular mechanism of action, demonstrating that the mechanism previously accepted was wrong,
(iii) the molecular engineering of glucansucrases to create totally new regioselective synthetic pathways, and
(iv) the application of these enzymes to the synthesis of prebiotic oligosaccharides (e.g., BioEcolia®, 200 t/y) for dermocosmetic use.

Professor Monsan is the author of more than 240 publications, 3 books and 65 patents. Also, he is Chairman of the French Federation of Biotechnology and a member of:

- the French Academy of Technology,
- the French Academy of Agriculture,
- the “College of Fellows” of the American Institute for Medical and Biological Engineering (AIMBE),
- the Executive Board of the European Federation of Biotechnology.

ENZYME ENGINEERING AWARDEES

with

a list of conference sites

1971 - Henniker, New Hampshire, USA

1973 - Henniker, New Hampshire, USA

1975 - Portland, Oregon, USA

1977 - Bad Neuenahr, Germany

1979 – Henniker, New Hampshire, USA

1981 – Kashikojima, Japan

1983 – White Haven, Pennsylvania, USA - **ICHIRO CHIBATA**

1985 – Helsingor, Denmark - **KLAUS MOSBACH**

1987 – Santa Barbara, California, USA - **EPHRIAM KATCHALSKI-KATZIR**

1989 – Kashikojima, Japan - **SABURO FUKUI**

1991 – Kona, Hawaii, USA - **ALEX KLIBANOV**

1993 – Deauville, France - **MALCOLM LILLY**

1995 – San Diego, California, USA - **MARIA-REGINA KULA** and **CHRISTIAN WANDREY**

1997 – Beijing, China - **HARVEY BLANCH**

1999 – Kona, Hawaii, USA - **CHI HUEY WONG**

2001 – Potsdam, Germany - **HIDEAKI YAMADA**

2003 – Santa Fe, New Mexico, USA - **JON DORDICK** and **DOUG CLARK**

2005 – Gyeongju, Korea - **DEWEY RYU**

2007 - Harrison Hot Springs, British Columbia, Canada - **FRANCES H. ARNOLD**

2009 – Groningen, The Netherlands - **SAKAYU SHIMIZU**

2011 – Vail, Colorado, USA – **DAVID ESTELL**

2013 – Toyama, Japan – **YASUHISA ASANO**

2015 – St. Petersburg, Florida, USA – **DAN TAWFIK**

2017 – Toulouse, France – **PIERRE MONSAN**

Conference Sponsors

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Enzyme Engineering XXIV - SCHEDULE AT A GLANCE

Sun. Sept. 24	Mon. Sep 25	Tues. Sept. 26	Wed. Sept. 27	Thur. Sept. 28
	08:30 - 12:20 Session 1: Enzyme engineering and synthetic biology	**08:30 - 12:25** Session 3: Structure/activity/Dynamic /Evolution	**08:30 - 12:26** Session 5: Biocatalysis/Engineering/ Chemicals	**08:30 - 12:30** Session 6: Biocatalysis/Engineering/ Process FFH
	10:20 - 10:50 Coffee/Networking Break	**10:30 - 11:00** Coffee/Networking Break	**10:30 - 11:00** Coffee/Networking Break	**10:20 - 10:50** Coffee/Networking Break
	12:20 - 14:00 Lunch	**12:30 - 14:00** Lunch	**12:30** Free afternoon - Boxed lunch provided	**12:30 - 14:00** Lunch
	14:00 - 17:58 Session 2: Computational design/artificial catalyst	**14:00 - 18:35** Session 4: Sequence and Function-based discovery		**14:00 - 17:20** Session 7: Biocatalysis/enzyme engineering/Sustainable development
15:00 - 17:45 Conference Check-in	**15:30 - 16:00** Coffee/Networking Break	**15:30 - 16:00** Coffee/Networking Break		**15:20 - 15:50** Coffee/Networking Break
17:45 - 18:00 Welcome - Conference Chairs & ECI Liaison	**18:00 - 20:10** Poster Session	**18:35 - 20:10** Poster Session		**17:30 - 18:30** Enzyme Engineering Award
18:00 - 19:00 Plenary				
19:00 - 20:00 Dinner	**20:15** Dinner	**20:15** Dinner		**19:30** Gala Dinner

Sunday, September 24, 2017

15:00 – 17:45	Conference check-in (Pierre Baudis Congress Center, Level 1, Concorde Foyer)
17:45 – 18:00	**Welcome Remarks** (Conference chairs and ECI liaison)
18:00 – 19:00	**Plenary lecture** **Biocatalysts for a biological chemistry: Bringing new chemistry to life** Frances Arnold, California Institute of Technology, USA
19:00 – 20:00	Welcome reception (Hotel Novotel)

NOTES

- *Technical Sessions will be in Concorde 1 in the Pierre Baudis Congress Center.*
- *Poster sessions will be in the Concorde Foyer in the Pierre Baudis Congress Center.*
- *Lunches will be in Concorde 2 in the Pierre Baudis Congress Center.*
- *Dinner locations are noted in the program.*
- *The ECI office will be in the Mermoz Room (Mezzanine Level, Pierre Baudis Congress Center).*
- *Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, PDAs, watches) is strictly prohibited during the technical sessions, unless prior permission has been granted by the author and ECI.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 3-5 minutes for questions and discussion.*
- *Please do not smoke at any conference functions.*
- *Turn your mobile telephones to vibrate or off during technical sessions.*
- *Please write your name on your program so that it can be returned to you if lost or misplaced.*
- *After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.*

Monday, September 25, 2017

Session 1: Enzyme engineering and synthetic biology
Session Chairs: Bernard Hauer and Joelle Pelletier
Sponsored by L'Oreal

08:30 – 09:00	**Programmable DNA-guided artificial restriction enzymes: Discovery, engineering, and applications** Huimin Zhao, University of Illinois at Urbana-Champaign, USA
09:00 – 09:30	**Towards high-value chemicals production harnessing synthetic biology** Eriko Takano, University of Manchester, United Kingdom
09:30 – 10:00	**Discovery and engineering systems for multi-enzyme catalysis** Claudia Schmidt-Dannert, University of Minnesota, USA
10:00 – 10:20	**Enhanced biological production of industrial products through integrated approaches** Ian Fotheringham, Ingenza, Ltd., United Kingdom
10:20 – 10:50	Coffee break in the poster area *Sponsored by AB Enzymes GmbH*
10:50 – 11:20	**Designer enzymes for industrial applications** Daniela Grabs, Arzeda Corporation, USA
11:20 – 11:40	**Using the CODEEVOLVER® directed evolution platform to create improved enzymes for molecular diagnostics** Vesna Mitchell, Codexis, Inc., USA
11:40 – 12:00	**Bio-Isobutene production: When the key enzymes are nowhere to be found** François Stricher, Global Bioenergies, France
12:00 – 12:20	**Aviation biofuels: How are enzymes deemed to play a critical role in the development of sustainable solutions?** Olivier Rolland, Boeing, France
12:20 – 14:00	Lunch

Session 2: Computational design/artificial catalyst
Session Chairs: Stefan Lutz and Anu Koivula

14:00 – 14:30	**Computational design of reprogrammed and new protein functions** Tanja Kortemme, University of California, San Francisco, USA
14:30 – 15:00	**"Bio" catalysis for energy: Enzymes, artificial enzymes and bioinspired catalyst** Marc Fontecave, Collège De France, France

Monday, September 25, 2017 (continued)

15:00 – 15:30	**Design and evolution of artificial enzymes** Don Hilvert, ETH-Zurich, Switzerland
15:30 – 16:00	Coffee break in the poster area
16:00 – 16:30	**Artificial (METALLO-) enzymes: Design and application** Gérard Roelfes, University of Groningen, Netherlands
16:30 – 17:00	**Computer-aided engineering of enzymes for in vitro and in vivo production of novel precursors** Isabelle André, LISBP-INSA, France
17:00 – 17:10	Stretch break
17:10 – 17:22	**Enzyme activity by design: An artificial rhodium hydroformylase for linear aldehydes** Amanda Jarvis, University of St. Andrews, United Kingdom
17:22 – 17:34	**Reaction dynamics analysis of an E. coli protein translation system by computational modeling** Tomoaki Matsuura, Osaka University, Japan
17:34 – 17:46	**Computationally designed libraries expand the functional scope of enzymes** Olga Khersonsky, Weizmann Institute of Science, Israel
17:46 – 17:58	**Novel quantum mechanics based engineering approach enables transaminase to convert bulky ketone substrates** Pravin Kumar, Quantumzyme LLP, India
18:00 – 20:10	Poster Session / Social hour
20:15	Dinner at Hotel Mercure

Tuesday, September 26, 2017

Session 3: Structure/activity/Dynamic /Evolution
Session Chairs: Claudia Schmidt Dannert and Huimin Zhao

08:30 – 09:00	**Evolution of protein dynamics over 3.5 billion years at the heart of enzyme catalysis and regulation** Dorothee Kern, Brandeis University, USA
09:00 – 09:30	**The fourth dimension: Accounting for dynamics when engineering enzymes** Joelle Pelletier, University of Montreal, Canada
09:30 – 10:00	**KnowVolution: Redesigning enzymes for innovations** Ulrich Schwaneberg, RWTH Aachen, Germany
10:00 – 10:15	**Directed evolution of a fluorinase for improved fluorination efficiency on a non-native substrate** Huihua Sun, Metabolic Engineering Research Laboratory (MERL), Singapore
10:15 – 10:30	**Engineering enzymes, pathways, and microbes through the use of an automated organism engineering foundry** Brynne C. Stanton, Ginkgo Bioworks, USA
10:30 – 11:00	Coffee break in poster area *Sponsored by the Japanese Society of Enzyme Engineering*
11:00 – 11:30	**Structure and function of lytic polysaccharide monooxygenases (LPMOS) and other redox enzymes involved in biomass processing** Vincent G. H. Eijsink, Norwegian University of Life Sciences, Norway
11:30 – 11:50	**Lessons from data-driven stabilization of industrial enzymes** Jens E. Nielsen, Novozymes, Denmark
11:50 – 12:05	**Redesign of water networks for efficient biocatalysis** Per-Olof Syrén, KTH Royal Institute of Technology, Sweden
12:05 – 12:25	**Behind the scenes: Science that drives Illumina's sequencing chemistry** Amirali Kia, Illumina Inc., USA
12:30 – 14:00	Lunch

Session 4: Sequence and Function-based discovery
Session Chairs: Uwe Bornscheuer and Isabelle André

14:00 – 14:30	**Discovering novel carbohydrate-active enzymes** Bernard Henrissat, AFMB – CNRS, France
14:30 – 15:00	**In silico methods in enzyme screening and gene expression** Yasuhisa Asano, Toyama Prefectural University, Japan

Tuesday, September 26, 2017 (continued)

15:00 – 15:30	**Biological diversity and chemical knowledge as driving forces in enzyme engineering** Bernhard Hauer, University of Stuttgart, Germany
15:30 – 16:00	Coffee break *Sponsored by Quantumzyme LLP*
16:00 – 16:30	**Microfluidic droplets as tools for high-throughput biology: Enzyme evolution, recruitment and discovery based on catalytic promiscuity** Florian Hollfelder, University of Cambridge, United Kingdom
16:30 – 17:00	**High-throughput functional metagenomics for the discovery of glycan metabolizing pathways** Alexandra Tauzin, LISBP/INSA University Toulouse, France
17:00 – 17:30	**Experiment-based computational method for proper annotation of the molecular function of enzymes** Véronique De Berardinis, Genoscope, CEA, France
17:30 – 17:35	Short break
17:35 – 17:47	**Characterization, metagenomic screening and engineering of bacterial nitroreductases for biomedical research applications** David Ackerley, Victoria University of Wellington, New Zealand
17:47 – 17:59	**Metagenomics and sequence similarity networks expose cryptic sequence space to enable enzyme discovery and enhance engineering strategies** Janine Copp, University of British Columbia, Canada
17:59 – 18:11	**New enzymes acting on bioactive compounds and unique catalysis** Michihiko Kobayashi, The University of Tsukuba, Japan
18:11 – 18:23	**Refining and mining the phylogeny of Glycoside Hydrolase Family 74 via structure-function analysis** Gregory Arnal, University of British Columbia, Canada
18:23 – 18:35	**New glucose isomerase - fit for biorefinery challenge** Klara Birikh, MetGen, Finland
18:35 – 20:10	Poster session / Social hour
20:15	Dinner at Hotel Mercure

Wednesday, September 27, 2017

Session 5: Biocatalysis/Engineering/Chemicals
Session Chairs: Daniela Grabs and Yasuhisa Asano
Sponsored by Givaudan Schweiz AG

08:30 – 09:00	**Expanding substrate scope and altering stereopreference of enzymes through advanced protein engineering** Uwe Bornscheuer, Greifswald University, Germany
09:00 – 09:30	**Engineering biocatalytic nanoreactors** Stefan Lutz, Emory University, USA
09:30 – 10:00	**Computational library design and screening: Creating elephant paths in enzyme evolution** Dick Janssen, University of Groningen, Netherlands
10:00 – 10:15	**Recognition of l-β-homomethionine by methionyl-trna synthetase** Giuliano Negro, Ecole Polytechnique, Université Paris-Saclay, France
10:15 – 10:30	**Enzyme evolution and engineering using insertions and deletions** Stephane Emond, University of Cambridge, United Kingdom
10:30 – 11:00	Coffee break in the poster area *Sponsored by Novozymes*
11:00 – 11:30	**Carboxylation of phenols and asymmetric nucleophile addition across C=C bond** Kurt Faber, University of Graz, Austria
11:30 – 11:50	**Biocatalysis: We create chemistry - with a little help from enzymes** Kai Baldenius, BASF SE, Germany
11:50 – 12:02	**Enzymatic glycosylation of Ellagic acid** Maude Brossat, L'Oréal Research & Innovation, Advanced Research, Aulnay-sous-Bois, France
12:02 – 12:14	**Engineering of haloalkane dehalogenase enantioselectivity towards βbromoalkanes: Open-solvated versus occluded-desolvated active sites** Radka Chaloupkova, Masaryk University, Czech Republic
12:14 – 12:26	**Engineering the substrate scope of the Fe(II) dependent halogenase WelO15** Sabrina Hoebenreich, Fachbereich Chemie Philipps-Universität Marburg, Germany
12:30	Free afternoon – Boxed lunches will be distributed at check-in area (special needs lunch request must show card distributed at check-in the receive special lunch)
13:15	Meet tour buses in front of Hotel Mercure

Wednesday, September 27, 2017 (continued)

18:00	Bus from Citi De L'Espace tour returns
19:00	Buses from Albi and Carcassonne tours return
19:01	Dinner on your own in Toulouse (many restaurants and outdoor cafes in Capitole)

Thursday, September 28, 2017

Session 6: Biocatalysis/Engineering/Process FFH
Session Chairs: Dick Janssen and Maude Brossat

08:30 – 09:00	**Accessing new and improved enzymes for unnatural glycoside synthesis and cell surface antigen removal through metagenomics, gene library synthesis and directed evolution** Steve Withers, University of British Columbia, USA
09:00 – 09:30	**Oxidoreductase reactions for cosmeceutical production from soy bean products** Byung-Gee Kim, Seoul National University, Korea
09:30 – 10:00	**Engineering chitin deacetylases for the biotechnological production of patterned chitosans** Toni Planas, IQS Universitat Ramon RUll, Barcelona, Spain
10:00 – 10:20	**Enabling brighter living by enzyme engineering: From structure inspired trial and error to structure guided design** Jan Metske Van der Laan, DSM Food Specialties, Netherlands
10:20 – 10:50	Coffee break in the poster area
10:50 – 11:10	**Glucan dendrimer for carbohydrate drugs** Takashi Kuriki, Ezaki Glico Co., Ltd., Japan
11:10 – 11:30	**Genomic characterization and gene regulation optimization to further improve an enzymatic mix used as feed additive** Olivier Guais, Adisseo France SAS, France
11:30 – 11:42	**Bacillus subtilis cell factory converting phytic acid into scyllo-inositol, a therapeutic agent for Alzheimer's disease** Ken-ichi Yoshida, Kobe University, Japan
11:42 – 11:54	**New insights in bacillus subtillis levansucrase mechanism and applications** Agustin Lopez Munguia, IBt-UNAM, Mexico
11:54 – 12:06	**Harnessing a versatile robust lactonase for biotechnological applications** David Daudé, Gene&GreenTK, France
12:06 – 12:18	**Synthetic biology of modular enzymes: From enzymes to enzybiotics** Yves Briers, Ghent University, Belgium
12:18 – 12:30	**Chemo-enzymatic hybrid process for production of monatin, a high intensity sweetener** Yasuaki Takakura, Ajinomoto Co., Inc., Japan
12:30 – 14:00	Lunch

Thursday, September 28, 2017 (continued)

Session 7: Biocatalysis/enzyme engineering/Sustainable development
Session Chairs: Magali Remaud-Simeon and Byung-Gee Kim

14:00 – 14:30	**Enzymatic biomass utilization and modification** Anu Koivula, VTT Technical Research Centre of Finland Ltd, Finland
14:30 – 15:00	**Directed evolution of a Swiss knife ligninase: The unspecific peroxygenase** Miguel Alcalde, Institute of Catalysis, ICP, CSIC, Madrid, Spain
15:00 – 15:20	**Soluble carbohydrate fiber production for food ingredient applications** Robert DiCosimo, DuPont Industrial Biosciences, USA
15:20 – 15: 50	Coffee Break
15:50 – 16:10	**End of life of plastics: enzyme-catalyzed biodegradation or recycling** Alain Marty, Carbios, France
16:10 – 16:30	**Finding the right molecule - knowledge-driven enzyme discovery** Wolfgang Aehle, BRAIN AG, Germany
16:30 – 16:42	**Increased trans-glycosylation activity of hexosaminidases for synthesis of human milk oligosaccharides** Jan Muschiol, Technical University of Denmark, Denmark
16:42 – 16:54	**Understanding and manipulating non-templated peptide bond formation by macrocyclase enzymes** Clarissa Czekster, University of St Andrews, United Kingdom
16:54 – 17:06	**Enzyme shielding in a soft organo-silica layer – pharma/biopharma applications** Yves Dudal, INOFEA AG, Switzerland
17:06 – 17:18	**New application of transglucosidase with α-glucosidase inhibitor in the digestive tract** Yoshihiko Hirose, Enzyme Application Consultant, Japan
17:20 – 17:30	**Presentation of Enzyme Engineering Award to Pierre Monsan**
17 :30 – 18 :30	**Enzyme Engineering Award Lecture**
18 :30 – 18 :40	**Announcement of winners of Student Poster Competition**
18 :40	**Closing Remarks by Conference Chairs**
19:20	Buses leave for Gala Dinner (in front of Mercure Hotel)
19:45	Gala Dinner at Musée des Abattoirs

Poster Presentations

1. **Engineering of camel chymosin for improved cheese properties**
   Christian Jäckel, Chr. Hansen A/S, Denmark

2. **Expanding the repertoire of sortases applicable for advanced protein engineering**
   Martin Schatte, RWTH Aachen, Germany

3. **Synthetic enzymes for synthetic substrates**
   Doris Ribitsch, ACIB GmbH, Austria

4. **Less is more: Hydrolysis of polyesters is enhanced by a truncated esterase**
   Doris Ribitsch, ACIB - Austrian Centre of Industrial Biotechnology, Austria

5. **Absorbance-activated-droplet sorting for directed enzyme evolution**
   Raphaelle Hours, University of Cambridge, United Kingdom

6. **In vitro production of L-cysteine using thermophilic enzymes**
   Kohsuke Honda, Osaka University, Japan

7. **Machine learning to engineer antibody frameworks for developability**
   Claes Gustafsson, ATUM, USA

8. **Effects of antioxidant bienzyme conjugate in rats with endotoxin shock model after different regime of administration**
   Alexander V. Maksimenko, Russian Cardiology Research and Production Complex, Russia

9. **Spray congealing for immobilization of biocatalysts**
   Udo Kragl, University of Rostock, Germany

10. **Oxygen supply to biocatalytic oxidations**
    Mafalda Dias Gomes, Technical University of Denmark (DTU), Denmark

11. **In silico enzyme engineering - successful stories and future outlook**
    Maria Fatima Lucas, Zymvol, Spain

12. **Engineering and preclinical evaluation of a human enzyme immune checkpoint inhibitor for cancer therapy**
    Everett M. Stone, University of Texas at Austin, USA

13. **Engineering of carbohydrate oxidoreductases for sensors and bio-fuelcells**
    Clemens Peterbauer, University of Natural Resources and Life Sciences Vienna, Austria

14. **Functional transitions in enzyme evolution: Balancing stability, folding and catalytic specificity**
    Bert van Loo, University of Münster, Germany

15. **Enzymes involved in polyunsaturated fatty acid saturation metabolism in lactic acid bacteria and its application for functional lipid synthesis**
    Jun Ogawa, Kyoto University, Japan

16. **An endoglucanase, GsCelA, from Geobacilus sp. undergoes an intriguing self-truncation process for enhancing activity and thermostability**
    Tuan-hua David Ho, Academia Sinica/Institute of Plant and Microbial Biology, Taiwan

17. **The enzyme mechanism of a de novo designed and evolved aldolase**
Cathleen Zeymer, ETH Zurich, Switzerland

18. **Hydrogen bond networks facilitate the conversion of aliphatic aldehydes in the charged active site of S. cerevisiae transketolase**
Stefan Robert Marsden, TU Delft, Netherlands

19. **Engineering a robust cyclohexanone monooxygenase for the production of methyl propanoate**
Elvira Romero, University of Groningen, Netherlands

20. **Engineer flexible loops for improved enzyme thermostability**
Haoran Yu, University College London, United Kingdom

21. **Two strategies to engineer flexible loops for improved enzyme thermostability**
Haoran Yu, University College London, United Kingdom

22. **Eicosapentaenoic acid conversion by cytochrome P450 BM-3 and its mutants to bio-active epoxide derivatives**
Michiki Takeuchi, Kyoto University, Japan

23. **Development of rapid immunoasssay using nanoluc-derived peptide tags**
Yuki Ohmuro-Matsuyama, Tokyo Institute of Technology, Japan

24. **Novel biocatalytic modules for the cell-free conversion of cellodextrins to glucaric acid**
Kerstin Petroll, Macquarie University, Australia

25. **Hyperthermophilic archaea as a source for novel enzyme discovery**
Haruyuki Atomi, Kyoto University, Japan

26. **Disruptive mixed in vitro-in silico approach for protein engineering and screening**
Frederic Cadet, PEACCEL - Protein Engineering ACCELerator, France

27. **Successful examples of the application of novel iterative trainable algorithms to guide rational mutation strategies for enzyme engineering: From prediction to lab testing to algorithm retraining**
Alvaro Olivera-Nappa, University of Chile, Chile

28. **Multiple reactions for the asymmetric synthesis of unusual amino acids**
Makoto Hibi, Toyama Prefectural University, Japan

29. **Laboratory-directed evolution as a tool for anticipating insecticide resistance**
Galen J. Correy, Australian National University, Australia

30. **Engineering the substrate scope of the Fe(II) dependent halogenase WelO15**
Sabrina Hoebenreich, Philipps-Universität Marburg, Germany

31. **Entropy and water dynamics in enzymatic polycyclization reactions**
Charlotte Lydia Maria Kürten, KTH-Royal Institute of Technology, Sweden

32. **Production of medium chain fatty acid by Yarrowia lipolytica: Combining molecular design and TALEN to engineer the fatty acid synthase**
Coraline Rigouin, LISBP, INSA, CNRS, INRA, Université de Toulouse, France

33. **Computational design of catalytically active TIM barrel xylanases**
Rosalie Lipsh, Weizmann institute if science, Israel

34. **Engineering biofilm-blocking enzymes**
Shereen Asha Murugayah, University of Otago, New Zealand

35. **Rapid enzyme stabilization by computationally designed libraries of HMF oxidase**
Caterina Martin, University of Groningen, Netherlands

36. **The pyrroloquinoline-quinone (PQQ)-dependent quinohemoprotein pyranose dehydrogenase from Coprinopsis cinerea (CcPDH), belonging to the AA12 family, drives lytic polysaccharide monooxygenase (LPMO) action**
Aniko Varnai, NMBU, Norway

37. **Substrate-based protein engineering of a flavoprotein oxidase for improved alcohol over-oxidation**
Mathias Pickl, University of Graz, Austria

38. **Using strucutral information for predicting NAD(P)(H) cofactor specificity, while unveiling the responsible molecular determinants, in enzymes with unknown structure**
Tiago Resende, University of Minho, Portugal

39. **Production of rhamnolipids-producing enzymes of Pseudomonas in E. coli and structural characterization**
Qingxin Li, ASTAR, Singapore

40. **Microbial production of rhamnolipids from isolate pseudomonas sp. —A mono-rhamnolipid producer**
Hui Qing Chong, Institute of Chemical and Engineering Sciences, Singapore

41. **Enzymatic esterification of lactones in aqueous buffer**
Lucas Hammerer, ACIB/University of Graz, Austria

42. **Peptidase-lipase bifunctional enzyme expressed in pichia pastoris**
Hamilton Cabral, School of Pharmaceutical Sciences of Ribeirão Preto, Brazil

43. **Microbial production of lipopeptides as biosurfactants for varied applications**
Jin Chuan Wu, Institute of Chemical Engineering and Sciences, Singapore

44. **Switching the cofactor specificity of an imine reductase**
Bettina M. Nestl, Universitaet Stuttgart, Germany

45. **Generation of new imine reducing enzymes - expansion of the imine reductase sequence space**
Maike Lenz, Universitaet Stuttgart, Germany

46. **Broadening the substrate scope of strictosidine synthases by site-directed mutagenesis**
Elisabeth Eger, University of Graz, Austria

47. **Enzymatic synthesis of glucan dendrimer for pharmaceutical applications**
Michiyo Yanase, Ezaki Glico Co., Ltd., Japan

48. **How the α-substititionof substrate affects the specific activity and stereoselectivity of carbonyl reductase**
Xi Chen, Tianjin Institute of Industrial Biotechnology, Chinese Academy of Sciences, China

49. **Rieske non-heme dioxygenases: Versatile biocatalysts for the generation of vicinal Cis-Diols**
Julia M. Halder, Universitaet Stuttgart, Germany

50. **Structure and function of unusual Rieske-type oxygenases from human microbiota involved in carnitine metabolism**
Yun-Bin Han, Shanghai Institute for Advanced Immunochemical Studies (SIAIS), ShanghaiTech University, China

51. **Crystal structure of a novel (R)-selective amine transaminase and approaches to broaden its substrate scope by rational engineering**
Aline Telzerow, Graz University of Technology, Austria

52. **Design of novel enzymed-catalyzed reactions linked to protein sequences for finding enzyme engineering targets**
Jasmin Hafner, Swiss Federal Institute of Technology (EPFL), Switzerland

53. **Enhancement of activity and thermostability of a Geobacillus endoglucanase via a unique self-truncation process**
Mei-huey Wu, National Cheng Kung University, Taiwan

54. **Computational protein design to accelerate the conception of fine-tuned biocatalysts**
Sophie Barbe, LISBP INSA/INRA, France

55. **PockeMO - the structure of a robust polycyclic ketone monooxygenase as a scaffold for engineering biocatalysts active on bulky substrates**
Maximilian Josef Ludwig Johannes Fürst, University of Groningen, Netherlands

56. **Engineering the enantioselective reduction of citral isomers in NCR ene reductase**
Nico Kreß, University of Stuttgart, Germany

57. **Functional metagenomic screening approach for discovery of new glycoside phosphorylases**
Spencer S. Macdonald, University of British Columbia, Canada

58. **Site-directed mutagenesis of structural hot spots for enhanced solubility of deoxyxylulose phosphate pathway enzymes**
Xixian Chen, Biotransformation Innovation Platform (BioTrans), Singapore

59. **Metabolic design of Escherichia coli for muconic acid production**
Ryosuke Fujiwara, Kobe university, Japan

60. **Docking and molecular dynamics approach for enzyme selection for α, β-reduction of enoate moiety: Toward renewable production of adipic acid**
Jaeho Shin, Chalmers University of Technology, Sweden

61. **Microbial platform to synthesize chorismate derivatives via metabolic engineering approach**
Shuhei Noda, RIKEN, Japan

62. **An extracellular protein expression system in Escherichia coli implies potential application**
Qingsheng Qi, Shandong University, China

63. **Engineering DNA polymerases for application in DNB-based sequencing technology**
Yue Zheng, University of Copenhagen, China

64. **Enhancement of lipase selectivity by site directed mutagenesis**
Katja Zorn, Universität Greifswald, Germany

65. **Metabolic engineering of S. pombe via CRISPR-Cas9 genome editing for lactic acid production from glucose and cellobiose**
Tsutomu Tanaka, Kobe University, Japan

66. **Identification of keratinolytic function in Chryseobacterium camelliae Dolsongi-HT1 isolated from Green Tea**
Eun-Mi Kim, Amorepacific, South Korea

67. **Sortase A-assisted metabolic enzyme ligation in Escherichia coli**
Takuya Matsumoto, Kobe University, Japan

68. **Discovery, characterization and engineering of bacterial thermostable cellulose-degrading enzymes**
Marianne S. Jensen, Norwegian University of Life Sciences - NMBU, Norway

69. **Optimizing the phosphorus cycle in the sugar beet production process by phytase supplement**
Wei Long, RWTH Aachen University, Germany

70. **Critical role of metals in biochemical properties of xylose isomerase**
Misun Lee, University of Groningen, Netherlands

71. **Development of a novel homogeneous immunoassay using mutant beta-glucuronidase**
Jiulong Su, Tokyo Institute of Technology, Japan

72. **Stereodivergent cyclopropanation of unactivated alkenes with heme proteins**
Anders M. Knight, California Institute of Technology, USA

73. **Rational enhancement of the enantioselectivity of Candida antarctica lipase B in kinetic resolution of N-(2-ethyl-6-methylphenyl) alanine**
Liangyu Zheng, Jilin University, China

74. **Characterization of a glucose-tolerant β-1,4-glucosidase BglC from Cytophaga hutchinsonii**
Xuemei Lu, Shandong University, China

75. **Computational redesign of transaminase active site**
Elisa Lanfranchi, University of Groningen, Netherlands

76. **Engineering bacterial nitroreductases for anticancer gene therapy and targeted cell ablation**
Abigail V. Sharrock, Victoria University of Wellington, New Zealand

77. **Simultaneous randomisation of eight key active site residues in E. coli NfsA to generate superior nitroreductases for prodrug activation**
Kelsi R. Hall, Victoria University of Wellington, New Zealand

78. **Use of positive selection methods for discovery and improvement of nitroreductase enzymes for cancer gene therapy**
Michelle H. Rich, Victoria University of Wellington, New Zealand

79. **Development of a selection to recover improved DNA ligase enzymes during directed evolution**
Katherine J. Robins, Victoria University of Wellington, New Zealand

80. **Engineering the indigoidine-synthesising enzyme BpsA for diverse applications in biotechnology**
Alistair S. Brown, Victoria University of Wellington, New Zealand

81. **Engineering a lipase for organic cosolvent resistance - How do current directed evolution approaches compete with the potential that nature offers?**
Ulrich Markel, RWTH Aachen University, Germany

82. **Enzymatic synthesis of cyclic imino acids**
Ryoma Miyake, Mitsubishi Chemical Corporation, Japan

83. **Metabolic engineering of Saccharomyces cerevisiae to harness natures valuable compounds**
Christian Nyffenegger, Evolva Biotech A/S, Denmark

84. **The angle of a side-chain decides regio- and enantioselectivity in Alcohol Dehydrogenase A**
Thilak Reddy Enugala, Uppsala University, Sweden

85. **Directed evolution of artificial metalloenzyme – in vivo catalysis**
Shreyans Chordia, University of Groningen, Netherlands

86. **Exploring the promiscuity of LmrR as a scaffold for artificial metalloenzymes**
Cora Gutiérrez, University of Groningen, Netherlands

87. **A fluorescent hydrogel-based flow cytometry screening platform for hydrolytic enzymes**
Volkan Besirlioglu, RWTH Aachen University, Germany

88. **Discovery and development of novel glucanotransferases for healthier foods**
Tim Börner, Nestlé Research Centre, Switzerland

89. **Engineering 2'O-mRNA methyltransferases for industrial biocatalysis**
Pierre-Yves Colin, University College London, United Kingdom

90. **Engineering better quorum quenching enzymes**
Thomas James Wiggins, University of Otago, New Zealand

91. **Effect of additional domains on the elongation mechanism and fructosyl linkage specificity of the multidomain levansucrase LevS**
Flor de María García-Paz, Instituto de Biotecnología, Mexico

92. **Papaya lipases heterologous expression: Towards structure and function relationship**
Georgina Sandoval, Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco A.C. (CIATEJ), Mexico

93. **A novel atomistic motional correlation method combined with thermodynamics to delineate the intricate mechanism of substrate specific catalysis: Enzyme engineering perspective**
Naveen Kulkarni, QUANTUMZYME LLP, India

94. **Molecular cloning and Biochemical properties of GH-16 β-agarase from Gilvimarinus agarolyticus JEA5**
Youngdeuk Lee, Korea Institute of Ocean Science & Technology, South Korea

95. **Biochemical properties of a novel neoagarotriose-producing β-agarase from Gilvimarinus agarolyticus JEA5**
Eunyoung Jo, Korea Institute of Ocean Science & Technology, South Korea

96. **Recombinant protein production in Escherichia coli by combining of signal peptide originated from Bacillus subtilis**
Chulhong Oh, Korea Institute of Ocean Science & Technology, Korea University of Science and Technology, South Korea

97. **A newly identified glutaminase-free L-asparaginase (L-ASPG86) from the marine bacterium Mesoflavibacter zeaxanthinifaciens**
Su-Jin Lee, Korea Institute of Ocean Science & Technology, South Korea

98. **Synergistic effect of acetyl xylan esterase on xylanase reaction originated from Ochrovirga pacifica**
Sachithra Amarin Hettiarachchi, Korea Institute of Ocean Science & Technology, Korea University of Science and Technology, South Korea

99. **Development of screening method for the selection of mutants to improve the substrate specificity of Pyrococcus furiosus thermostable amylase**
Nan-Young Lee, Chungnam National University, South Korea

100. **Improving bread quality using Deinococcus geothermalis glycogen branching enzyme**
Eun-Ji Park, Chungnam National University, South Korea

101. **Improving activity of an N-glycosyltransferase using a medium throughput HPLC assay**
Timothy G. Keys, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

102. **FireProt: Web server for automated design of thermostable proteins**
Radka Chaloupkova, Masaryk University, Czech Republic

103. **CAVERDOCK: A new tool for analysis of ligand binding and unbinding based on molecular docking**
Radka Chaloupkova, Masaryk University, Czech Republic

104. **HotSpot Wizard 3.0: Automated design of site-specific mutations and smart libraries**
Radka Chaloupkova, Masaryk University, Czech Republic

105. **Marine DNA polymerases as tools for next generation molecular diagnostics solutions**
Yvonne Piotrowski, University of Tromsø, Norway

106. **Multifunctional enzyme engineering by computational design for lignocellulosic valorization**
Claire Dumon, INRA-INSA, France

107. **Construction of a secondary metabolite deficient penicillium chrysogenum strain as a generic production host for secondary metabolites**
Fabiola Polli, University of Groningen, Netherlands

108. **Glycodiversification: Glycosynthases towards variation of flavonoid glycosides**
Marc Richard Hayes, Heinrich-Heine-University Düsseldorf, Germany

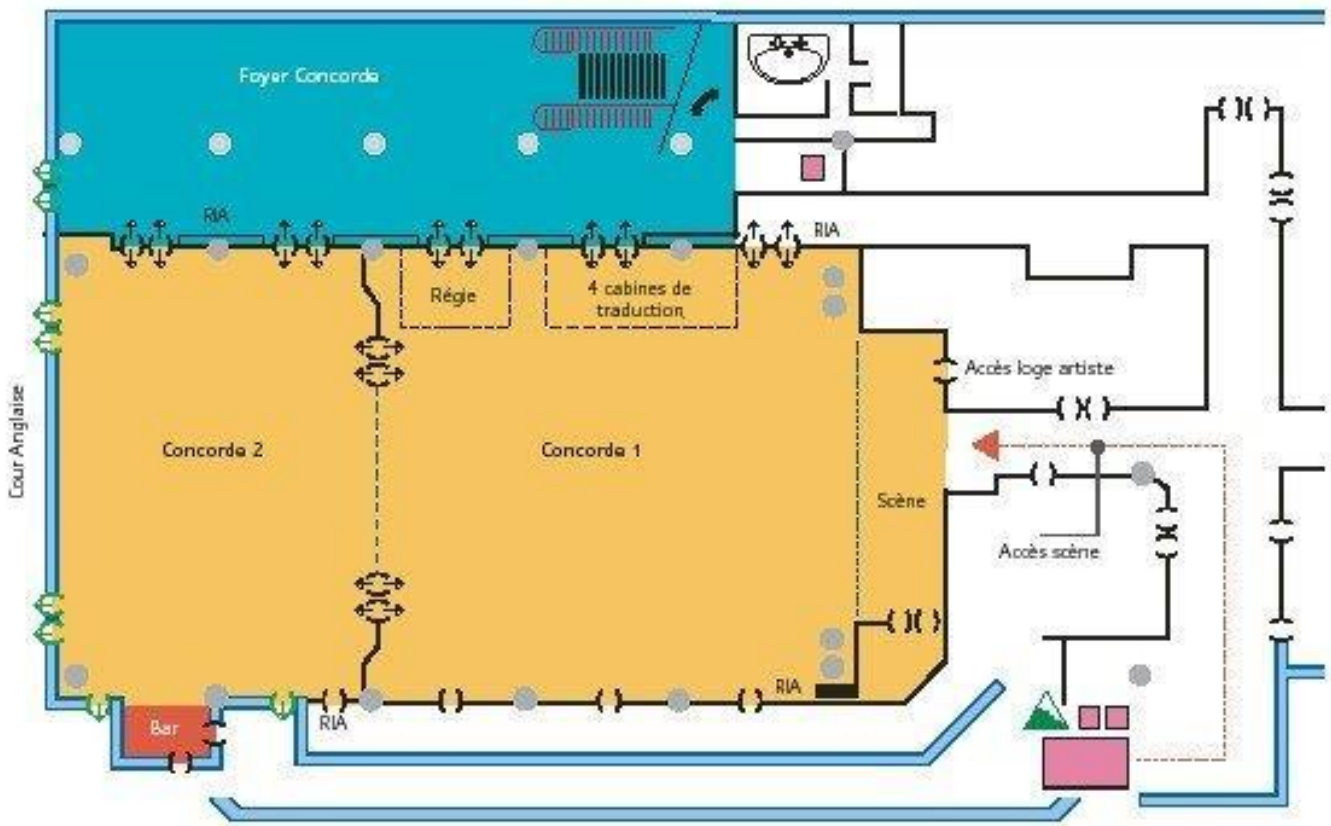
109. **Protein engineering of Candida rugosa lipase**
Satoru Ishihara, Amano Enzyme Inc, Japan

110. **Artificial ligninolytic secretome by S. cerevisiae: Building a white-rot yeast**
David Gonzalez-Perez, Institute of Catalysis and Petrochemistry (CSIC), Spain

111. **Exploring donor substrate promiscuity of a Thermostable Transketolase by directed evolution**
Thangavelu Saravanan, Groningen University, Netherlands

112. **Tailored biosynthesis of plant-derived ginsenoside Rh2 in yeast via repurposing a key promiscuous microbial enzyme**
Yan Feng, Shanghai Jiao Tong University, China

Pierre Baudis Congress Center – Level 1



ACCESS MAP

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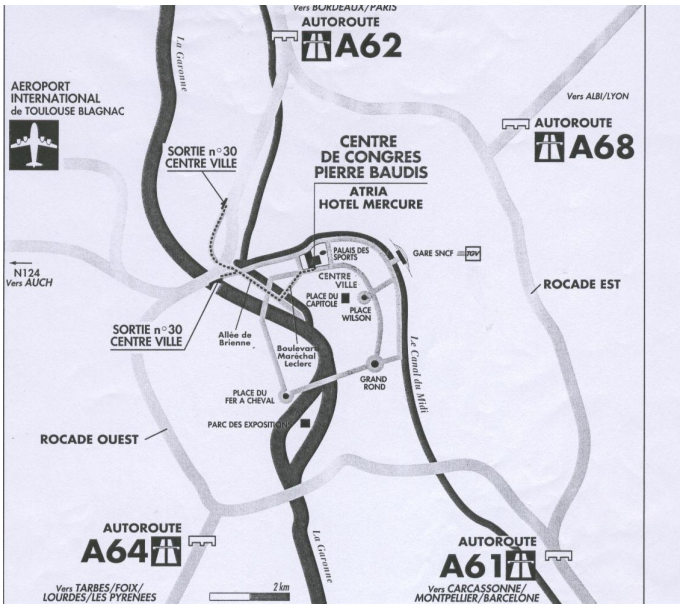

Direct access by the Toulouse ring road, exit n°30 to the town centre.

GETTING THERE

- The Conference Center border a 17 acre park set around a Japanese garden.
- Adequate parking facilities : 1000 places under the Conference Center ; 400 more on the Place de l'Europe, and neighbourhood further 200 in the nearby Arnaud Bernard .