

Final Program

Enzyme Engineering XX

September 20-24, 2009
Groningen, the Netherlands

Sunday, September 20, 2009

14.30 – 17.00	Registration (Academy Building) Opening Lectures (Chair: Dick Janssen)
17:00 – 17:15	Opening Remarks – Dick Janssen
17:15 – 18:00	Marcel Wubbolts (DSM Pharmaceutical Products, The Netherlands) <i>Enzyme Engineering: Innovations by Design</i>
18:00 – 19:00	Manfred T. Reetz (Max-Planck-Institut für Kohlenforschung, Mülheim, Germany) <i>Directed Evolution of Enantioselective Enzymes: Probing Protein Sequence Space Efficiently</i>
19:00 – 19:15	Welcome Address (Frans Zwarts, Dean, University of Groningen)
19:15 – 20:30	Welcome Reception (Academy Building)

Notes

- The technical sessions and poster sessions from Monday through Thursday will be held at Martiniplaza.
- Audiotaping, videotaping and photography of presentations are strictly prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected copy will be sent to all participants after the conference.

Monday, September 21, 2009

Bioinformatics and Enzyme Discovery (Chairs: Bernhard Hauer & Yasuhisa Asano)

- 08:45 – 09:30 Patricia Babbitt (University of California, San Francisco, CA, USA)
Choosing Starting Structures for Enzyme Engineering: Learning from Natural Evolution
- 09:30 – 10:00 Lawrence P. Wackett (University of Minnesota, St. Paul, MN, USA)
Enzyme Engineering for Degrading and Detecting s-Triazines
- 10:00 – 10:30 Henk-Jan Joosten (Wageningen University, The Netherlands)
3DM: A Tool for Optimal Use of Super-Family Data for Enzyme Engineering
- 10:30 – 11:00 Coffee/Tea Break
- 11:00 – 11:30 Wolfgang Streit (University of Hamburg, Germany)
Metagenomics, biotechnology with not yet-cultured microbes
- 11:30 – 12:00 Marco W. Fraaije (University of Groningen, The Netherlands)
Discovery and Redesign of Flavoprotein Oxidases
- 12:00 – 12:30 Anton Glieder (Graz University of Technology, Austria)
Engineering, Expression and Screening Enzymes from Eukaryotes Using Pichia pastoris
- 12:30 – 13:00 Nadia Skorupa Parachin (Lund University, Sweden)
Development of High-Throughput Screening Methods for Metagenome Libraries
- 13:00 – 14:00 Lunch (Martiniplaza)
- 14:00 – 16:00 **Poster Session** with Coffee/Tea
- Computational and Statistical Approaches (Chair: Andreas Bommarius)**
- 16:00 – 16:45 Richard J. Fox (Codexis, Inc., Redwood City, CA, USA)
Principles of Enzyme Optimization for the Rapid Creation of Industrial Biocatalysts
- 16:45 – 17:15 Ullrich Schwaneberg (RWTH Aachen University, Germany)
Steering Directed Protein Evolution: Strategies To Benchmark And To Manage Combinatorial Complexity Of Mutant Libraries
- 17:15 – 17:45 Paolo Braiuca (Paolo Braiuca, University of Trieste, Italy)
QSAR Computational Routes For The Prediction Of Enzyme Properties

Monday, September 21, 2009 (continued)

- 17:45 – 18:15 Denis Pompon (Centre de Génétique Moléculaire du CNRS, Gif-sur-Yvette, France)
The Function Mapping of Cytochrome P450s, an Approach to Turn Around Combinatorial Limitations in Protein Engineering
- 18:15 – 20:00 Dinner (Martiniplaza)
- 20:00 – 21:30 **Poster Session** and Social Hour (coffee, tea, drinks)

Tuesday, September 22, 2009

Structure-Based Protein Engineering and Directed Evolution (Chair: Lawrence Wackett)

- 08:45 – 09:30 Bengt Mannervik (Uppsala University, Sweden)
GSTs as a Paradigm for Enzyme Redesign and Evolution
- 09:30 – 10:00 Julie Rannes (University of Manchester, UK)
Enzyme Engineering of New Variants of Galactose Oxidase for Glycan and Glycoprotein Labelling
- 10:00 – 10:30 Claes Gustafsson (DNA2.0 Inc., Menlo Park, CA, USA)
Synthetic Genes + Design of Experiment = Bioengineering

10:30 – 11:00 Coffee/Tea Break

Emerging Applications I (Chair: Oliver May)

- 11:00 – 11:30 Michihiko Kobayashi (University of Tsukuba, Japan)
Discovery of a New Post-Translational Modification and Development of a New Expression System in Streptomyces
- 11:30 – 12:00 Zhanglin Lin (Tsinghua University, Beijing, China)
Terminal Amphipathic Alpha-Helix Induced in Vivo Formation of Active Enzyme Aggregates
- 12:00 – 12:30 Akihiko Kondo (Kobe University, Japan)
Production of Bio-Fuels and Chemicals from Biomass by Consolidated Bioprocessing Using Cell Surface Engineered Yeast Cells
- 12:30 – 13:00 Hak Sung Kim (KAIST, Korea)
Development of High-Throughput Assay Format for Evolution of Potential Therapeutic Enzymes

13:00 – 14:00 Lunch (Martiniplaza)

Innovations in Gene Synthesis, Library Generation and Screening (Chair: Marco Fraaije)

- 14:00 – 14:45 Henrik Moellgaard (Direvo Industrial Biotechnology GmbH, Cologne, Germany)
DIREVO IBT'S Highly Efficient Toolbox for Improvement of Biomass Degrading Enzymes
- 14:45 – 15:15 Jan van den Brulle (Sloning BioTechnology, Puchheim, Germany)
Slonomics - A Unique Technology for the Controlled Generation of Truly Randomized Gene Libraries
- 15:15 – 15:45 Christian Kranz (GENEART AG, Regensburg, Germany)
On the Benefit of Rationally Designed Synthetic Libraries
- 15:45 – 16:15 Coffee/Tea Break

Tuesday, September 22, 2009 (continued)

Directed Evolution (Chair: Jiri Damborsky)

- 16:15 – 17:00 Dan S. Tawfik (Weizmann Institute of Science, Rehovot, Israel)
Directed Enzyme Evolution – Beyond the Low-Hanging Fruit
- 17:00 – 17:30 Joelle N. Pelletier (Université de Montréal, Canada)
Engineering Enzymes with High Drug Resistance: Ligand Discrimination Provides Efficient Selective Markers for Mammalian Cells
- 17:30 – 18:00 Patrice Soumillon (Université Catholique de Louvain, Belgium)
Engineering a Beta-Lactamase Allosterically Regulated by Kanamycin
- 18:00 – 18:30 Wim J. Quax (University of Groningen, The Netherlands)
Lipase Enantioselectivity Engineered by Loop Engrafting and Genetic Selection
- 18:30 – 20:00 Dinner (Martiniplaza)

Wednesday, September 23, 2009

Engineering Industrial Enzymes (chair: Patricia Babbitt & Akihiko Kondo)

- 08:45 – 09:30 Philip N. Bryan (University of Maryland Biotechnology Institute, Rockville, MD, USA)
Engineering Tightly-Regulated, High-Specificity Proteases
- 09:30 – 10:00 David Estell (Genencor, Palo Alto, CA, USA)
Altering Enzyme Surfaces to Dramatically Improve Performance
- 10:00 – 10:30 Jan-Metske van der Laan (DSM Food Specialties, The Netherlands)
Biodiversity Guided Design of Food Enzymes: Opportunities and Limitations
- 10:30 – 11:00 Coffee/Tea Break
- 11:00 – 11:30 Masakazu Sugiyama (AJINOMOTO AminoScience Laboratories, Japan)
Aldolase-Catalyzed Syntheses of L-Sugars and Iminocyclitols
- 11:30 – 12:00 Theo Sonke (DSM Pharmaceutical Products, The Netherlands)
Engineering of Threonine Aldolases for Diastereoselective Carbon-Carbon Bond Formation
- 12:00 – 12:30 Yasuhisa Asano (Toyama Prefectural University, Japan)
*Enzymatic Transcrystallization of Ω -Lauro lactam to 12-Aminolauric Acid by Ω -Lauro lactam Hydrolase from *Acidovorax* sp. T31*
- 12:30 – 13:00 Karl-Heinz Maurer (Henkel AG, Düsseldorf, Germany)
Low Temperature Protease Performance in Liquid Detergents
- 13:00 – 14:00 Lunch (Martiniplaza)
- 14:00 – 16:00 **Poster Session** with Coffee/Tea
- Emerging Applications II (Chair: Karl-Erich Jaeger)**
- 16:00 – 16:45 Craig A. Townsend (Johns Hopkins University, Baltimore, MD, USA)
Structural and Mechanistic Understanding of Type I Iterative Polyketide Synthases and Their Potential for Unnatural Product Synthesis
- 16:45 – 17:15 Saulius Klimasauskas (Institute of Biotechnology, Vilnius, Lithuania)
Engineering Methyltransferase Reactions for Targeted Labeling Of Biopolymers
- 17:15 – 17:45 Magali Remaud-Simeon (Université de Toulouse, France)
Engineering Amylosucrases with New Specificities for a Programmed Chemo-Enzymatic Synthesis of Oligosaccharides Entering in Carbohydrate-Based Vaccines

Wednesday, September 23, 2009 (continued)

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| 17:45 – 18:15 | Kouichi Kuroda (Kyoto University, Japan)
<i>Construction of Whole Cell Biocatalyst for Biorefinery by Cell Surface Display of Laccase</i> |
| 18:15 – 20:00 | Dinner (Martiniplaza) |
| 20:00 – 21:30 | Poster Session and Social Hour (coffee, tea, drinks) |

Thursday, September 24, 2009

Innovations in Expression (Chairs: Philip Bryan & David Estell)

- 08:45 – 09:30 Karl-Erich Jaeger (Research Centre Juelich, Germany)
Novel Biocatalyst Expression Systems
- 09:30 – 10:00 Helmut Schwab (Graz University of Technology, Austria)
Pig Liver Esterase: An Old Enzyme Made Fit for Broad Applications by Molecular Engineering
- 10:00 – 10:30 Richard A. Gross (Polytechnic Institute of NYU, NY, USA)
Engineering Candida tropicalis for Conversions of Fatty Acids to Ω -Hydroxy Fatty Acids
- 10:30 – 11:00 Coffee/Tea Break
- Medical Applications (Chair: Bengt Mannervik)**
- 11:00 – 11:30 David Ackerley (Victoria University of Wellington, New Zealand)
Development of Novel Bacterial Nitroreductase Enzymes for Anti-Cancer Gene Therapy
- 11:30 – 12:00 Thomas Scanlon (Dartmouth College, Hanover, NH, USA)
Genetically Engineered Lysozyme for Treatment of Pulmonary Infections
- 12:00 – 12:30 Teruyuki Nagamune (The University of Tokyo, Japan)
Sortase-Mediated Site-Specific Labeling of Cell Surface Proteins on Living Cells
- 12:30 – 13:00 Stefan Lutz (Emory University, Atlanta, GA, USA)
Making The Lock Fit The Key - Engineering Kinases to Phosphorylate Nucleoside Analogs for Antiviral and Cancer Therapy
- 13:00 – 14:00 Lunch (Martiniplaza)
- Enzyme Design (Chair: Dan Tawfik)**
- 14:00 – 14:30 Bernhard Hauer (University of Stuttgart, Germany)
The Challenge of Designing Biocatalysts
- 14:30 – 15:00 Daniela Grabs (Arzeda Corp., Seattle, WA, USA)
Custom-Made Biocatalysts
- 15:00 – 15:30 Jiri Damborsky (Masaryk University, Brno, Czech Republic)
Engineering of Biocatalysts with Modified Activity, Specificity and Stability by Modification of Access Tunnels
- 15:30 – 16:00 Robertus J.M. Klein Gebbink (Utrecht University, The Netherlands)
Active-Site Selective Modification of Lipase With Organometallic Moieties
- 16:00 – 16:30 Coffee/Tea Break

Thursday, September 24, 2009 (continued)

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| 16:30 – 17:15 | Selected Oral Poster Presentations (Chair: Stephen Withers) |
| 17:30 – 18:30 | Enzyme Engineering Award Lecture (Chair: Christian Wandrey)
Sakayu Shimizu (Kyoto University, Japan)
<i>2009 Enzyme Engineering Award Lecture</i> |
| 18:30 | Conference Closure |
| 19:00 – 23:00 | Conference Dinner |

Enzyme Engineering XX Poster List

Applications in Biocatalysts, Medicine, and New Biomaterials

1. *Identification of enzymes catalyzing conversion of N^2 -Z-L-lysine into N^2 -Z-L-aminoadipic acid in *Rhodococcus sp.* AIU Z-35-1*
Kimiyasu Isobe, Iwate University, Japan
2. *Rational design of *Candida antarctica* lipase B for the ring opening polymerization of lactides*
Mohamad Takwa, Royal Institute of Technology (KTH), Sweden
3. *Development of self-sufficient Baeyer-Villiger monooxygenases*
Anette Riebel, Groningen Biomolecular Sciences and Biotechnology Institute, The Netherlands
4. *Biofuel cell with NADH oxidation*
Hidekatsu Maeda, Soka University, Japan
5. *A new method to prepare 3-hydroxypropionic acid with 3-chloropropionic acid dehalogenase from *Bacillus sp.**
Lirong Yang, Institution of Biochemical Engineering, Department of Chemical Engineering, Zhejiang University, P. R. China
6. *Functional expression of bacterial cytochrome P450s in *E. coli* for the biotransformation of daidzein to produce ortho-specific monohydroxylation*
Kim Byunggee, School of Chemical and Biological Engineering, Institute of Biochemical Engineering, Seoul National University, South Korea
7. *Design of a cytochrome P450BM3 reaction system linked by two-step cofactor regeneration*
Tsuyoshi Mouri, Department of Applied Chemistry, Graduate School of Engineering, Kyushu University, Japan
8. *Expression, characterization and application of OPMA*
Yingjiu Zhang, Key Laboratory for Molecular Enzymology and Engineering of Ministry of Education, Jilin University, P.R.China
9. *Design of new fluorescent substrates for covalent protein labeling catalyzed by microbial transglutaminase*
Noriho Kamiya, Department of Applied Chemistry, Graduate School of Engineering, Kyushu University, Japan
10. *Biotransformation of polydatin in *Polygonum cuspidatum* to resveratrol by β -glucosidase from *Penicillium decumbens**
Xin Song, Shandong University, China

- 11.** *Chemoselective lipases distinguish between alcohol and thiol substrates in transacylation reactions*
Cecilia Hedfors, Department of Biotechnology, Royal Institute of Technology, Sweden
- 12.** *Enzymatic production of dipeptide using L-amino acid α -ligase and polyphosphate kinase*
Hajime Ikeda, Bioprocess Development Center, Kyowa Hakko BIO Co., Ltd, Japan
- 13.** *Development and applications of ene reductase CodexTM Pane*
Vesna Mitchell, Codexis, Inc., USA
- 14.** *Discovery and evaluation of novel nitroreductases that can activate the anti-cancer prodrug CB1954*
Gareth Prosser, Victoria University of Wellington, New Zealand
- 15.** *Selective monoacylation of diols using CALB variants*
Anders Hamberg, KTH School of Biotechnology, Sweden
- 16.** *Development of integrated bioprocesses for optimized production of recombinant enzymes with Pichia pastoris*
Prof. Dr.-Ing. Reiner Luttmann, Hamburg University of Applied Sciences, Germany
- 17.** *Pantothenate kinase as a gatekeeper in the biotransformation of coenzyme A-based antimetabolites and protein labels*
Marianne van Wyk, Department of Biochemistry, Stellenbosch University, South Africa
- 18.** *The GH-57 family glycogen branching enzyme of Thermus thermophilus*
Marta Palomo, University of Groningen, The Netherlands
- 19.** *Penicillin acylase-catalyzed resolution of amino compounds in aqueous medium*
Vytautas Svedas, Faculty of Bioengineering & Bioinformatics, Lomonosov Moscow State University, Russia
- 20.** *Cytochrome P450 monooxygenase-catalyzed steroid hydroxylations*
Anett Kirschner, University of Groningen, The Netherlands
- 21.** *Biocatalytic preparation of (r)-2-hydroxy-propionaldehyde by Gluconobacter oxydans*
Dongzhi Wei Keliang Gao, State Key Lab of Bioreactor Engineering, East China University of Science and Technology, China
- 22.** *Miniemulsion as a green chemistry reaction media in biosynthesis of fatty acids alkyl esters*
Dragana P. C. de Barros, Institute for Biotechnology and Bioengineering, Centre for Biological and Chemical Engineering, Instituto Superior Técnico, Portugal

23. *Two novel carbonyl reductases from yeast and bacterial strains, and their application to the stereoselective synthesis of (R)-3-quinuclidinol*
Michihiko Kataoka, Graduate School of Agriculture, Kyoto University, Japan
24. *Free-enzyme catalysts for the remediation of environmental triazine contamination*
Colin Scott, Commonwealth Scientific and Industrial Research Organisation, Australia
25. *New nitrile hydratases for enantioselective biocatalysis*
Linda G. Otten, Delft University of Technology, The Netherlands
26. *An enzyme toolbox for carboligation*
Martina Pohl, University of Dusseldorf, Germany
27. *Immobilization in Lentikat® based particles: towards the production of fructose syrups*
Pedor Fernandes, IBB-CEBQ-IST, Portugal
28. *Cloning and characterization of an amino ester hydrolase from xanthomonas campestris pv. Campestris, atcc 33913 for enzymatic synthesis of ampicillin*
Janna, Blum, Michael, Ricketts, Andreas, Bommarius, Georgia Institute of Technology, United States
29. *The effect of varying substrate ratios in the penicillin g acylase catalyzed synthesis of ampicillin in systems with and without organic co-solvents*
Andria L. Deaguero, Georgia Institute of Technology, United States

Bioinformatics and Genome Mining for New Enzymes

30. *Characterization of the 4-a-glucanotransferase from Archaeoglobus fulgidus*
Hans Leemhuis, Physiology, Groningen Biomolecular Sciences and Biotechnology Institute (GBB), University of Groningen, The Netherlands

Computational and Statistical Approaches for Enzyme Engineering

31. *HotSpot Wizard: A web server for protein engineering*
Jiri Damborsky, Masaryk University, Czech Republic
32. *Molecular dynamic simulations of lipases with different force fields*
Valerio Ferrario, Universita' degli Studi di Trieste, Department of Pharmaceutical Science, Italy
33. *Change of substrate specificity of a phenylalanine ammonia lyase*
Sebastian Bartsch, Greifswald University, Germany

Directed Evolution and High-Throughput Screening

- 34.** *Design of proline-based biocatalysts for making carbon-carbon bonds*
Ellen Zandvoort, Department of Pharmaceutical Biology, University of Groningen, The Netherlands
- 35.** *SeSaM, maximizing the diversity potential of biocatalysts in directed evolution*
Alexander Schenk, SeSaM-Biotech GmbH, Germany
- 36.** *4-Oxalocrotonate tautomerase: A small promiscuous template for natural and laboratory evolution of new enzymes*
Bert-Jan Baas, University of Groningen, The Netherlands
- 37.** *Modification of the substrate specificity of a fungal oxidase*
Sandra Gerstenbruch, University of Greifswald, Germany
- 38.** *Changing the substrate specificity of aspartate ammonia lyase*
Puthan Veetil Vinod, Dept. of Pharmaceutical Biology, University of Groningen, The Netherlands
- 39.** *Efficient catalytic promiscuity for chemically distinct reactions*
Ann Babbie, Cambridge University (Department of Biochemistry), UK
- 40.** *A new recombinant expression system for Candida antarctica lipase B: from large scale production to high-throughput screening*
Cédric Montanier, UMR5504, UMR792 Ingénierie des Systèmes Biologiques et des Procédés, CNRS, INRA, INSA, France
- 41.** *High throughput screening for microbial transglutaminases using fluorescent proteins*
Jae-Hun Lee, Seoul National University, South Korea
- 42.** *Development of a HTS method for the selection of xylanase variants displaying improved hydrolytic activity on wheat straw*
Sophie Bozonnet, LISBP – INSA, France
- 43.** *Riboswitch-guided protein evolution*
Josh K. Michener, California Institute of Technology, USA
- 44.** *Development of an Enzyme-Based Multiplex Fluorescent Reporter System*
Claire Horvat, Victoria University of Wellington, New Zealand
- 45.** *Amorphadiene synthase - probing the active site with directed mutagenesis*
Magdalena Czepnik, The University of Groningen, The Netherlands
- 46.** *Increasing the activity of haloalkane dehalogenase DhaA with anthropogenic substrate 1,2-dichloroethane using methods of focused directed evolution*
Pavel Dvorak, Loschmidt Laboratories, Institute of Experimental Biology and National Centre for Biomolecular Research, Faculty of Science, Masaryk University, Czech Republic

- 47.** *Changing the substrate specificity of a plant epoxide hydrolase*
Ann Gurell, Department of Biochemistry and Organic Chemistry, Sweden
- 48.** *Development of an in vitro system for continuous directed evolution of high affinity protein ligands*
Maren Meysing, GENEART AG, Germany
- 49.** *Decreasing glucose inhibition of Trichoderma reesei Cel6A by directed evolution*
James Lavigne, Iogen Corp., Canada
- 50.** *Molecular Evolution of Transaminases for Production of Chiral Amines and Amino Alcohols*
Cha Minh, School of Chemical and Biological engineering, Seoul National University, South Korea
- 51.** *Approaches for evaluation and high-throughput evolution of bacterial nitroreductase enzymes that activate DNA-damaging prodrugs*
Janine Copp, Victoria University of Wellington, New Zealand
- 52.** *Mutations in salt-bridging residues affect regioselectivity, protein stability and hysteresis*
Diana Lindberg, Dept. of Biochemistry and Organic Chemistry, Sweden
- 53.** *Development of screening systems to investigate NRPS thiolation domain interactions*
Jeremy Owen, Victoria University of Wellington, New Zealand
- 54.** *A system for the continuous evolution of proteins in vivo*
Kathrin Brunner, GENEART AG, Germany
- 55.** *Enzymatic Resolution of α -Haloacids and Esters and their Use in the Preparative Scale Synthesis of Pharmacologically Active Compounds*
Shu-Ling Tang, University of Manchester, United Kingdom
- 56.** *Directed evolution of an anti-tumor drug (arginine deiminase) for increased activity at physiological pH*
Leilei Zhu, Jacobs Univeristy Bremen, Germany
- 57.** *Use of focused mutagenesis and Cluster-Screening for the generation of new Candida antarctica Lipase B mutants with improved properties*
Marc Struhalla, c-LEcta GmbH, Germany
- 58.** *Two screening approaches to shift the substrate specificity of P450cam by directed evolution*
Gregor Hoffmann, University of Leipzig, Germany
- 59.** *Alteration of the substrate specificity of a lipase and a glucose dehydrogenase by directed evolution*
Meike Ballschmiter, Institute of Biochemistry, Department of Biosciences, Pharmacy and Psychology, University of Leipzig, Germany

60. *Toolbox for creating tailor-made enzymes*
Henrike Brundiek, Institute of Biochemistry, Germany
61. *Engineering of a penicillin v acylase from pectobacterium carotovorum*
Remler Peter, Applied Biocatalysis Research Centre, Austria
62. *Enhancing epoxide cyanolysis by protein engineering of halohydrin dehalogenase from agrobacterium radiobacter ad1*
Marcus Schallmey, University of Groningen, The Netherlands
63. *A 10e5-fold specificity change in an nrps gatekeeper adenylation domain by directed evolution*
Florian Hollfelder, University of Cambridge, United Kingdom
64. *On the evolution of sequences specificity in dna methyltransferases*
Liat Rockah-Shmuel, Weizmann Institute of Science, Israel
65. *The thermostability enhancement of catechol 2,3-dioxygenase*
Shir-Ly Huang, National Central University & Center for Biotechnology and Biomedical Engineering, Taiwan

Engineered Enzymes for Biofuels Production

66. *Ionic Liquids as Novel Reaction Media for Biodiesel Fuel Production by Whole-cell Biocatalysts*
Kazunori Nakashima, Kobe University, Japan
67. *Directed Evolution through Rational Design: Iterative Saturation Mutagenesis for evolving Candida sp. lipase for Biodiesel Production*
Ritam Sarkar, Max-Planck-Institut für Kohlenforschung, Germany
68. *Novel Lignocellulose-Degrading Enzymes from Symbiotic Gut Protozoa of the Giant Northern Australian Termite, Mastotermes darwiniensis*
Chunhong Chen, CSIRO, Energy Transformed Flagship and Entomology, Australia
69. *Developing improved thermostable cellulases: high-throughput cellulolytic assays and protein engineering strategies*
Harshal Chokhawala, Tae-Wan Kim, Craig M. Dana, Dana Nadler, Douglas Clark, Harvey Blanch, University of California Berkeley, United States

Expression and Modification of Enzymes for Secondary Metabolites

70. *Characterization and expression profile analysis of the main cellulase in Penicillium decumbens*
Yuqi Qin, State Key Laboratory of Microbial Technology, China
71. *The use of Starch Binding Domains for expression and purification of proteins in fungal hosts*
Rachel van der Kaaij, TNO Quality of Life, The Netherlands

72. *Enzymatic Synthesis of 4-Hydroxyisoleucine with Novel Dioxygenase*
Makoto Hibi, Kyoto University, Japan
73. *Enhancement of activity of an organic solvent-stable lipase expressed by heterologous host*
Hiroyasu Ogino, Osaka Prefecture University, Japan
74. *Bioorganic synthesis of the key taxoid precursor taxadiene using a one-pot, two enzyme catalyzed reactions*
Stefan Jennewein Hans Schmeer, Fraunhofer IME, Germany
75. *Metabolic characterization of the salt stress response in Streptomyces coelicolor: Biosynthesis and transport of ectoines*
Stefan Kol, Rijksuniversiteit Groningen, Microbial Physiology, The Netherlands
76. *Chemical modification of endoinulinase by pyridoxal 5'-phosphate and ascorbic acid*
Homa Torabizadeh, University of Tehran, Tehran

Metabolic Engineering

77. *Identification of NADH kinase activity in filamentous fungi*
Gianni Panagiotou, Technical University of Denmark, Denmark
78. *Co-expression of periplasmic protein folding enzymes on antibody fragment production in Escherichia coli*
Dave Siak-Wei Ow, Bioprocessing Technology Institute, Singapore
79. *The metabolic engineering: a gel model for the functioning of enzymes inside the luminous bacterial cell*
Valentina A. Kratasyuk, Siberian Federal University, Russia

Miscellaneous

80. *Preliminary study on production and properties of acid-endurance amylase from Aspergillus sp.WL-357*
Ke Wu, Hefei University, China
81. *Alteration of the Diastereoselectivity and Nucleophile Specificity of 3-Methylaspartate Ammonia Lyase by Structure-Based Mutagenesis*
Raj Hans, Department of Pharmaceutical Biology, Groningen Research Institute of Pharmacy, University of Groningen, The Netherlands
82. *Novel tracks for explaining enantioselectivity of Candida antarctica lipase B (CALB) towards secondary alcohols*
Marianne GRABER, UMR CNRS 6250 LIENSs, Université de La Rochelle, France
83. *An effect on enzymatic activity of rare sugar producible enzyme Pseudomonas stutzeri L-rhamnose isomerase by truncating the C-terminal region*
Hiromi Yoshida, Kagawa University, Japan

- 84.** *Effects of mutations introduced into translation initiation region (TIR) of the pac gene on Penicillin G acylase production*
Özlem Akkaya, Gebze Institute of Technology, Turkey
- 85.** *A Novel Biocatalytic Route to β -Amino Acids*
O'Neill Maeve, University of Manchester, UK
- 86.** *Sortase-mediated site-specific protein-protein conjugation*
Tsutomu Tanaka, Organization of Advanced Science and Technology, Kobe University, Japan
- 87.** *Propanediol dehydrogenase, FucO, from Escherichia coli: Substrate specificity and catalysis*
Cecilia Blikstad, Dept. of Biochemistry and Organic Chemistry, Uppsala University, Sweden
- 88.** *Novel biocatalysts for asymmetric hydroamination reactions*
Bettina M. Nestl, School of Chemistry, University of Manchester, Manchester Interdisciplinary Biocentre, UK
- 89.** *From dehydrogenase to oxidase by a single Ala to Gly substitution*
Nicole Leferink, Wageningen University, The Netherlands
- 90.** *Effect of Mg²⁺ ions on kinetic and thermodynamic properties of invertases from Aspergillus niger*
Habibullah Nadeem, National Institute for Biotechnology and Genetic Engineering (NIBGE), Pakistan
- 91.** *Catalytic promiscuity in the alkaline phosphatase superfamily*
Bert van Loo, University of Cambridge - Department of Biochemistry, United Kingdom
- 92.** *A multi-component enzyme system for linoleic acid transformation to conjugated linoleic acid (CLA) in lactic acid bacteria*
Jun Ogawa, Research Division of Microbial Sciences, Kyoto University, Japan
- 93.** *Phenylalanine aminomutase – A promising tool for synthesis of enantiomerically pure β -amino acids*
Bian Wu, Wiktor Szymanski, Gerrit J. Poelarends, Ben L. Feringa and Dick B. Janssen, University of Groningen, The Netherlands
- 94.** *The potential role of phenotypic mutations in the evolution of protein expression and stability*
Moshe Goldsmith and Dan S. Tawfik, The Weizmann Institute of Science, Rehovot, Israel

- 95.** *Engineering of GFP through combinatorial mutagenesis of methionine residues based on consensus sequence*
Niraikulam Ayyadurai, Selvakumar Edwardraja, Soundrarajan Nagasundarapandian, and Sun-Gu Lee, Pusan National University, Busan, South Korea
- 96.** *Catalysis of iron core formation in pyrococcus furiosus ferritin*
Kourosh Honarmand Ebrahimi, Peter-Leon Hagedoorn, Jaap A. Jongejan, Wilfred R Hagen Delft University of Technology, The Netherlands
- 97.** *Directed evolution of lipase for stereoselective acceptance of new substrates*
Shreenath Prasad, Max-Planck-Institut fuer Kohlenforschung Kaiser-Wilhelm-Platz, Germany
- 98.** *Conversion of esterase estc from burkholderia gladioli into a hydroxynitrile lyase*
Sabine Feichtenhofer, TU Graz, Graz, Austria
- 99.** *Complete enzyme information in un-sequenced organisms*
Yamal, Al-ramahi, Maria-Eugenia, Guazzaroni, Ana, Beloqui, Manuel, Ferrer, CSIC – Institute of Catalysis Marie Curie, Madrid, Spain
- 100.** *Enantioselective conversions using haloalkane dehalogenases*
Alja Westerbeek, RUG - University of Groningen, The Netherlands
- 101.** *A novel platform for improving enzyme turnover by phage display*
Harshal Chokhawala, Zachary M. Carrico, Douglas S. Clark, Matt B. Francis, University of California Berkeley, United States
- 102.** *Bacillus carboxylesterases: rational “switch” of enantioselectivity*
Luis Godinho, RUG - University of Groningen, The Netherlands
- 103.** *New conducting biomaterial - Ion Jelly®*
Cristina M. Cordas, IBB-Institute for Biotechnology and Bioengineering, Instituto Superior Técnico, Portugal
- 104.** *Biodiesel production by an enzymatic transesterification using -microencapsulated recombinant cutinase in AOT-Isooctane reversed micelles*
Sara Badenes, IBB-Institute for Biotechnology and Bioengineering, Instituto Superior Técnico, Portugal
- 105.** *Genetic engineering of allosteric beta-lactamases*
Bruno Baudoux, Université Catholique de Louvain, Belgium
- 106.** *Thermostabilization of α -amylase from bacillus circulans by ancestral mutation method*
Kan Yamashiro, Amano Enzyme Inc, Japan
- 107.** *Expanding the synthetic applicability of hydroxynitrile lyase-catalyzed reaction*
Ken-ichi Fuhshuku, Toyama Prefectural University, Japan

- 108.** *Evolving penicillin acylase specificity by in vitro compartmentalisation*
Gabrielle Woronoff, Université Catholique de Louvain, Belgium
- 109.** *Key sequence motif directed cross-module recombination leads to efficient improvement of enzyme functions*
Yan Feng, Jilin University, China
- 110.** *Bioinspired enzyme encapsulation using chimeric silaffin-like peptides*
Stephane Emond, Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés,
France
- 111.** *Improvement of yarrowia lipolytica lipase enantioselectivity and thermostability*
Alain Marty, Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés,
France