Program

Metabolic Engineering IX:
Metabolic Engineering and Synthetic Biology

June 3 –7, 2012

Biarritz, France

Conference Co-Chairs
Philippe Soucaille
Université de Toulouse, INSA, UPS, INP, France

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Place Bellevue
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Welcome from the Conference Co-Chairs

It is our great pleasure to welcome you all to Biarritz, France for the Metabolic Engineering IX Conference. ECI's Metabolic Engineering is the longest running conference series of its kind, held every two years. This conference again emphasizes the interaction between cutting edge scientific developments and its rapid and successful transfer to sustainable industrial processes that help solving problems in the fields of supply of energy, particularly biofuels, of biomaterials, food and feed ingredients as well as compounds of pharmaceutical interest. The conference covers systems biology, synthetic biology, biochemical engineering, tools and methods, and emerging techniques, drugs, biofuels, biorefinery, and microbial and mammalian systems in the context of metabolic engineering. We hope that you will enjoy the state-of-the-art science and technology in metabolic engineering that will be shared at the conference. This conference will be a successful showcase of what we have done and what we can do with metabolic engineering and synthetic biology for the green growth of our world.

We are very pleased to inform you that we have more than 330 participants from more than 25 countries around the world. Attendees are well balanced among academia, industry and research institutes. Also, it is truly great to have more than 85 graduate students.

We have put a strong emphasis on the poster sessions to create a central scientific market place for the extended exchange of scientific results and ideas. The poster session room is the large and beautiful, with a splendid view of the Atlantic waves. We want to thank all the board members and session chairs for putting together a great program. We also would like to thank the poster chairs, Hal Alper (University of Texas, USA), Chetan T. Goudar (Bayer Healthcare, USA), Isabelle Meynials-Salles (University of Toulouse, France) and Caroline Peres (Danisco, USA), who put much effort into evaluating and selecting posters for presentation. We have more than 200 posters being presented at the conference and there will be a number of poster awards given out for the best presentations. Three Student/Young Investigator Poster Awards will be sponsored or co-sponsored by ECI and additional awards will be sponsored by the journals Metabolic Engineering (Elsevier), ACS Synthetic Biology (ACS), Journal of Industrial Microbiology & Biotechnology (Springer), Bioprocess & Biosystems Engineering (Springer) and Biotechnology Journal (Wiley). In addition, Metabolic Engineering Journal (Elsevier) will sponsor an award for the best overall poster of the conference.

The tradition of the most important and prestigious award in the field of metabolic engineering, the "International Metabolic Engineering Award," is continued in 2012. Professor Jay Keasling from the University of California, Berkeley, will receive this prize for his great accomplishments and leadership in metabolic engineering of biofuels and secondary metabolites and his dedication to the metabolic engineering community. Congratulations, Jay!

The Jay Bailey Young Investigator Best Paper Award will be presented as well. This year's winner is Dr. Christopher Henry, a scientist in the Mathematics and Computer Science division at Argonne National Lab. In the winning paper in Nature Biotechnology, Dr. Henry and colleagues describe a new web resource, called the Model SEED, for automated reconstruction of draft genome-scale metabolic models.

This conference is run at a rather high cost. It would not have been possible to hold our conference in Biarritz without generous support from the many companies listed in this booklet. On behalf of all of us, we would like to sincerely thank them for the kind support, especially at this financially difficult time.

There are many people we want to thank for making this conference possible. In particular, we want to thank Barbara Hickernell, Kathy Chan, and Kevin Korpics of ECI for providing streamlined administration. Also, we owe many thanks to Barry Buckland and Jens Nielsen from the Steering Committee for their valuable support.

We hope you will enjoy the conference and your stay in Biarritz. Again, welcome to Metabolic Engineering IX and welcome to Biarritz!

Co-Chairs of the conference

Elmar Heinzle	Philippe Soucaille	Gregg Whited
Saarland University	University of Toulouse	Danisco
Germany	France	USA

2012 International Metabolic Engineering Award Winner

Jay Keasling

The 2012 International Metabolic Engineering Award has been given to Professor Jay Keasling for his contributions to the field of metabolic engineering, through development of novel technologies and bioprocesses. Dr. Keasling is well known for his impressive work on metabolic engineering of yeast and *E. coli* for production of the antimalarial drug artemisinin, which became the foundation needed for commercial production. He also has a number of other seminal contributions to the field, including metabolic engineering of microorganisms for production of advanced biofuels. Dr. Keasling has also pioneered the development of a number of advanced technologies that have enabled metabolic engineering, including a range of methods for controlled protein expression.

Dr. Keasling is the Hubbard Howe Jr. Distinguished Professor of Biochemical Engineering at the University of California, Berkeley, in the Departments of Bioengineering and Chemical and Biomolecular Engineering, senior faculty scientist and Associate Laboratory Director for Biosciences at Lawrence Berkeley National Laboratory, Chief Executive Officer of the Joint BioEnergy Institute (JBEI), and director of the Synthetic Biology Engineering Research Center (SynBERC). Dr. Keasling's current research focuses on the metabolic engineering of microorganisms for degradation of environmental contaminants or for environmentally friendly synthesis of drugs, chemicals, and fuels.

Dr. Keasling received a B.S. in Chemistry and Biology from the University of Nebraska and M.S. and Ph.D. in Chemical Engineering from the University of Michigan, and did post-doctoral research in biochemistry at Stanford University. He is a member of the National Academy of Engineering. Dr. Keasling received the inaugural *Biotech Humanitarian Award* from the Biotechnology Industry Organization in 2009, the 2007 *Professional Progress Award* from the American Institute for Chemical Engineers, the first ever *Scientist of the Year* award from Discover Magazine in 2006, and the *Technology Pioneer* award from the World Economic Forum in 2005. Dr. Keasling is also the founder of Amyris, LS9, and Lygos.

2012 Jay Bailey Young Investigator Best Paper Award

Chris Henry

Winning Paper: "High-throughput generation, optimization and analysis of genome-scale metabolic models"
Christopher S Henry (corresponding author), Matthew DeJongh, Aaron A Best, Paul M Frybarger, Ben Linsay & Rick L Stevens
Nature Biotechnology 28, 977–982 (2010)

Dr. Christopher Henry is a scientist in the Mathematics and Computer Science division at Argonne National Laboratory. He also has joint appointments at the University of Chicago and Northwestern University. Dr. Henry is an expert in metabolic modeling, flux balance analysis, and biochemical thermodynamics. He is the co-lead for the Microbial Science team of the DOE Knowledgebase, and he is the PI for the Model SEED resource. Currently, Dr. Henry is conducting research in automated metabolic model reconstruction and refinement, integration of omics data into biological models, and large-scale analysis of microbial community behavior. Dr Henry received his B.S. in Chemical Engineering from the University of Dayton (2002), and his Ph.D. in Chemical Engineering from Northwestern University (2007).

In their article in Nature Biotechnology, Henry and colleagues describe a new web resource, called the Model SEED, for automated reconstruction of draft genome-scale metabolic models. The approach annotates the genes in a genome sequence, maps these genes to metabolic reactions, computes a 'biomass reaction' for simulating growth and then optimizes the model using several established techniques. Henry and colleagues apply this resource to create new genome-scale models for 130 diverse microbrial genomes, ranging from metabolically self-sufficient bacteria to parasites that rely on their hosts to provide many essential metabolic functions. The authors show how the models can be used to improve genome annotation and to assess global trends in microbial metabolism. They also demonstrate how Biolog phenotype arrays and gene essentiality data may be used to validate these models and further boost accuracy using flux-balance-analysis-based data fitting techniques. Since its release with the publication of this manuscript in Nature Biotechnology, Model SEED has been applied by 1300 scientists worldwide to construct over 13,000 metabolic models.

This award was instituted in honor of Jay Bailey, a visionary of future directions in biotechnological research and a brilliant contributor to the founding and advancement of the field of metabolic engineering (see Metabolic Engineering 3, 393, 2001; Biotechnology and Bioengineering 79 (5), 2002). The purpose of the award is to recognize outstanding research accomplishments in the field of metabolic engineering by a young investigator.

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Sunday, June 3, 2012

15:00 – 18:00 Conference check-in (Le Bellevue Congress Center, Entrance Hall)

18:00 – 18:40 **Plenary Lecture 1**
Vincent Schachter, Total Gas & Power, France
Developing industrial biotechnology through strategic partnerships

18:40 – 19:20 **Plenary Lecture 2**
Rolf Müller, Saarland University, Germany
Genomics based engineering for the identification and optimization of bioactive microbial natural products

19:30 – 22:00 Welcome cocktail dinner and Poster Session

NOTES

- Technical sessions will be held in the Auditorium.
- Poster sessions will be held in Atlantique Room.
- Lunches will be held in the Rotonde Room.
- The conference banquet on Wednesday will be held in a Basque farmhouse in the countryside. Buses will depart promptly at 19:00 from Casino Municipal in front of the town hall and Hotel Plaza.
- Audiotaping, videotaping and photography of presentations are 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.
- 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, June 4, 2012

	Breakfast at your hotel
09:00 – 09:40	**Plenary Lecture 3** **James Liao**, University of California Los Angeles, USA A tale of two butanols
09:40 – 12:10	**Session 1: Metabolic Engineering for Fuels and Chemicals** ***Sponsored by Total*** Jay Keasling, USA and Akihiko Kondo, Japan
09:40 – 10:10	**Ramon Gonzalez**, Rice University, USA Modular biosynthesis for the production of advanced fuels and chemicals
10:10 – 10:40	Coffee break / Posters available for viewing
10:40 – 11:10	**Akihiko Kondo**, Kobe University, Japan Development of microbial cell factories for the production of bio-fuels and bio-based chemicals through consolidated bioprocessing
11:10 – 11:40	**Donald E Trimbur**, LS9, USA Advances in the production of fuels and chemicals derived from fatty acid metabolism
11:40 – 12:10	**Bryan Rush**, Cargill, USA Turning a novel yeast into a platform host for industrial production of fuels and chemicals
12:10	Lunch on your own / Free afternoon
16:30 – 19:00	**Session 2: Metabolic Engineering for Chemicals and Materials** ***Sponsored by GS Caltex*** Friedrich Srienc, USA and George Chen, China
16:30 – 17:00	**Isabelle Meynial-Salles**, University of Toulouse, France Combination of rational metabolic engineering and evolutionary engineering to develop efficient cell factories for the production of chemicals
17:00 – 17:30	**Sheng Yang**, Shanghai Institutes for Biological Sciences, China Optimizing pentose utilization in Clostridia for improved solvents production from lignocellulosic hydrolystates
17:30 – 18:00	**Brian Pfleger**, University of Wisconsin-Madison, USA Metabolic engineering of bacteria for the production of alpha-olefins
18:00 – 18:30	**George Guo-Qiang Chen**, Tsinghua University, China Limitless opportunities for microbial production of hydroxyalkanoates based chemicals and materials
18:30 – 19:00	Discussion
19:00 – 22:00	Cocktail dinner and Poster Session (Authors of odd-numbered posters are asked to stay by their posters.)

Tuesday, June 5, 2012

	Breakfast at your hotel
09:00 – 09:40	**Plenary Lecture 4** **Sven Panke**, ETH, Switzerland Assembling and optimizing *in vitro* pathways
09:40 – 12:15	**Session 3: Emerging Tools and Methods in Metabolic Engineering** Vassily Hatzimanikatis, Switzerland and Joseph J. Heijnen, The Netherlands
09:40 – 10:10	**Lothar Eggeling**, Forschungszentrum Jülich GmbH, Germany Metabolite sensors for single-cell isolation of producing bacteria
10:10 – 10:40	Coffee break / Posters available for viewing
10:40 – 11:10	**Ryan Gill**, University of Colorado, USA Towards writing genomes: Drafting, editing, revising and publishing
11:10 – 11:40	**Vassily Hatzimanikatis**, EPLF Lausanne, Switzerland Frameworks for the development and analysis of genome-scale kinetic models
11:40 – 12:10	**Friedrich Srienc,** University of Minnesota, USA Predicting evolution
12:15 – 14:00	Lunch
14:00 – 14:40	**Plenary Lecture 5** **Sang Yup Lee**, KAIST, Korea Systems metabolic engineering for chemicals and materials
14:40 – 17:10	**Session 4: Systems Biology and Metabolic Engineering** ***Sponsored by Genomatica*** Jens Nielsen, Sweden and Wolfgang Wiechert, Germany
14:40 – 15:10	**Bernhard Palsson**, University of California Berkeley, USA Expanded genome-scale models for metabolic engineering
15:10 – 15:40	**Jens Nielsen**, Chalmers Institute of Technology, Sweden Systems biology of metabolism: Enabling technologies for metabolic engineering of yeast
15:40 – 16:10	Coffee break / Posters available for viewing
16:10 – 16:40	**Steffen Klamt**, Max Planck Institute, Magdeburg, Germany Minimal cut sets as computational tool in metabolic engineering: novel theoretical results and their applications
16:40 – 17:10	**Amit Deshmukh**, TU Delft, The Netherlands Understanding *in vivo* kinetics and transport through stimulus response experiments: *Penicillium chrysogenum* as host strain
17:10 – 19:00	Break
19:00 – 20:30	Dinner (Rotonde)
20:30 - 22:30	Poster Session / Social Hour (Authors of even-numbered posters are asked to stay by their posters.)

Wednesday, June 6, 2012

	Breakfast at your hotel
09:00 – 09:40	**Plenary Lecture 6** **Jeff Hasty**, University of California San Diego, USA Engineered gene circuits: From oscillators to synchronized clocks and biopixels
09:40 – 12:10	**Session 5: Synthetic Biology and Metabolic Engineering** An-Ping Zeng, Germany and Christopher Voigt, USA
09:40 – 10:10	**An-Ping Zeng**, Institute of Bioprocess and Biosystems Engineering, Germany Structure-based metabolic engineering and synthetic biology for efficient strain development
10:10 – 10:40	Coffee break / Posters available for viewing
10:40 – 11:10	**Christopher Voigt**, Massachusetts Institute of Technology, USA Programming bacteria
11:10 – 11:40	**Huimin Zhao**, University of Illinois at Urbana-Champaign, USA Pathway engineering via synthetic biology
11:40 – 12:10	**Hal Alper**, The University of Texas at Austin, USA Synthetic control of transcription: From hybrid promoters to promoter engineering to synthetic operon design
12:15 – 14:30	Lunch
14:30 – 17:00	**Session 6: Metabolic Engineering of Industrial Microorganism** Lars Nielsen, Australia and Christoph Wittmann, Germany
14:30 – 15:00	**Octavio Ramirez**, UNAM, Mexico Metabolic engineering strategies for overcoming environmental heterogeneities during process scale-up
15:00 – 15:30	**Christoph Wittmann**, Technical University Braunschweig, Germany Making use of models – In-silico driven metabolic engineering of industrial microorganisms
15:30 – 16:00	Coffee break / Posters available for viewing
16:00 – 16:30	**Mark Burk**, Genomatica, USA Sustainable production of industrial chemicals using microbial biocatalysts: 1,4-butanediol
16:30 – 17:00	**Hiroshi Shimizu**, University of Osaka, Japan Genome-wide multi-omics analysis of ethanol stress tolerant strain of *Escherichia coli* created by evolution engineering
17:00 – 17:45	**Metabolic Engineering Award 2012 Lecture**
17:45 – 17:55	**Jay Bailey Young Investigator Best Paper Award Presentation**
19:00 – 22:00	Conference Gala Dinner (at a Basque Farmhouse in the countryside) **Buses will depart promptly from Casino municipal (in front of the town hall and Hotel Plaza) at 19:00**

Thursday, June 7, 2012

	Breakfast at your hotel
09:30 – 12:00	**Session 7: Industrial Applications of Metabolic Engineering** Ramon Gonzalez, USA and Oskar Zelder, Germany
09:30 – 10:00	**Stefan Turk**, DMS Biotechnology Center, The Netherlands Fermentative production of 6-amino-caproic acid: Towards sustainable Nylon-6
10:00 – 10:30	**Ethel Jackson**, DuPont, USA Engineering of metabolic pathways and global regulators of *Yarrowia lipolytica* to produce high value commercial products
10:30 – 11:00	Coffee break
11:00 – 11:30	**Stefan de Kok**, Amyris, USA High throughput pathway engineering and screening for the high volume production of renewable chemicals in *Saccharomyces cerevisiae*: the industrialization of synthetic biology
11:30 – 12:00	**Esben H. Hansen**, Evolva Biotech A/S, Denmark In-cell enzymatic glycosylation: A way to improve productivity of heterologous biosynthesis pathways in micro-organisms.
12:00 – 13:20	Lunch
13:20 – 14:00	**Plenary Lecture 7** **Gregory Stephanopoulos**, MIT, USA New frontiers of metabolic engineering: Linking cancer and metabolism via isotope labeling and network analysis
14:00 – 16:30	**Session 8: Metabolic Engineering for Cell Culture and for Health** Martin Fussenegger, Switzerland and Michael Betenbaugh, USA
14:00 – 14:30	**Martin Fussenegger**, ETH, Switzerland Reprogramming mammalian cells for therapeutic applications
14:30 – 15:00	**Michael Betenbaugh**, Johns Hopkins University, USA 'Omics approaches to enhance mammalian cell metabolic engineering
15:00 – 15:30	Coffee Break
15:30 – 16:00	**Christian M. Metallo**, University of California San Diego, USA Metabolic regulation of human cells by oncogenes and the microenvironment
16:00 – 16:30	**Maciek Antoniewicz**, University of Delaware, USA Dynamic ^{13}C-metabolic flux analysis and parallel labeling experiments elucidate the rewiring of metabolic fluxes in CHO cell cultures
16:30	Closing Remarks

Posters

1. **A systems biology approach to characterize *Pseudomonas putida*'s potential as whole cell biocatalyst**
   Birgitta E. Ebert, RWTH Aachen University, Germany

2. **Enabling pyrolytic substrate utilization for the production of biorenewable fuels and chemicals**
   Laura R. Jarboe, Iowa State University, USA

3. **Isotopically nonstationary 13C flux analysis of Myc-induced metabolic reprogramming in B-cells**
   Taylor A Murphy, Vanderbilt University, USA

4. **Modular-based reconstruction of allosteric protein for dynamic control of cellular metabolism**
   Zhen Chen, Hamburg University of Technology, Germany

5. **Dissection and engineering of xylose-metabolic pathway in Clostridium acetobutylicum**
   Yang Gu, Chinese Academy of Sciences, China

6. **DNA supercoiling-mediated mechanism of L-glutamine overproduction in *Escherichia coli***
   Mikiro Hayashi, Kyowa Hakko Bio Co., Ltd., Japan

7. **Development of gamma-aminobutyric acid (GABA) overproducing recombinant *Escherichia coli* by engineering of glutamate decarboxylase and GABA transporter**
   SoonHo Hong, University of Ulsan, Korea

8. **5-aminolevulinic acid accumulation from glucose in Engineering *Escherichia coli***
   Qingsheng Qi, Shandong University, China

9. **Yeasts as biocatalysts for the desulfurization of xenobiotics**
   Tomas Linder, Swedish University of Agricultural Sciences, Sweden

10. **Bacterial copper biosensor construction through bacterial two-component system engineering**
    SoonHo Hong, University of Ulsan, Korea

11. **Synthesis of pure meso-2,3-butanediol from crude glycerol using an engineered metabolic pathway in *Escherichia coli***
    Soojin Lee, Sogang University, Korea

12. **Control of phosphate metabolism in a xylose-fermenting yeast strain improves ethanol production from xylose.**
    Tomohisa Hasunuma, Kobe University, Japan

13. **Recombinant protein products causing metabolic interferences in the host CHO cells**
    Erno Pungor Jr., BioMarin Pharmaceutical Inc, USA

14. **Reconstruction of sugar utilization pathways and regulons in solventogenic clostridia**
    Chen Yang, Chinese Academy of Sciences, China

15. **Regulation of metabolic fluxes in bacteria by acetylation of metabolic enzymes**
    Chen Yang, Chinese Academy of Sciences, China

16. **Quorum sensing-based IPTG-free system for production of bisabolene as a precursor of advanced biofuels in engineered *E. coli***
Han Min Woo, Lawrence Berkeley National Laboratory / Korea Institute of Science and Technology, USA/Korea

17. **Rational design of ^{13}C-Labeling experiments for metabolic flux analysis using elementary metabolite unit-basis vectors (EMU-BV)**
Scott B. Crown, University of Delaware, USA

18. **Advances in metabolic flux analysis: Parallel labeling experiments and dynamic metabolic flux analysis**
Robert W. Leighty, University of Delaware, USA

19. **Tandem mass spectrometry: A new frontier in ^{13}C-metabolic flux analysis**
Jungik Choi, University of Delaware, USA

20. **Consolidated bioprocessing for bioethanol production from agricultural waste biomass using a diploid yeast strain with optimized cellulase expression**
Ryosuke Yamada, Kobe University, Japan

21. **Co-expression of acca, fabd and thioesterase genes for increasing intracellular long-chain fatty acids in pseudomonas aeruginosa and *Escherichia coli***
Sunhee Lee, Sogang University, Korea

22. **A quantitative, graded dominant mutant approach for probing protein function and gene regulation**
Amanda M. Lanza, The University of Texas at Austin, USA

23. **Metabolic engineering of *Escherichia coli* to overproduce 10-hydroxystearic acid from oleic acid**
Eun-Yeong Jeon, Ewha Womans University, Korea

24. **Quantitative Quenching Evaluation and Direct Intracellular Metabolite Analysis of Penicillium chrysogenum Industrial Production Cultivations**
Timo Hardiman, Sandoz GmbH, Austria

25. **Metabolic engineering of Corynebacterium glutamicum for biotransformation of ¥á-keto acid precursors into non-proteinogenic amino acids**
Jin-Byung Park, Ewha Womans University, Korea

26. **Engineering streptomyces pristinaespiralis for improved pristinamycin production**
Yinhua Lu, Chinese Academy of Sciences, China

27. **Metabolic flux analysis of cyanobacteria on various trophic conditions**
Tsubasa Nakajima, Osaka University, Japan

28. **Effect of metabolic inhibitors on yeast central metabolism**
Fumio Matsuda, Kobe University, Japan

29. **Genome-scale reconstruction of metabolic network for yarrowia lipolytica and its applications in understanding of oleaginous yeasts**
Qiang Hua, East China University of Science and Technology, China

30. **Towards high-throughput single cell growth optimization and production analysis using picoliter bioreactors**
Wolfgang Wiechert, Forschungszentrum Jülich GmbH, Germany

31. **Engineering inhibitor tolerance for the production of biorenewable fuels and chemicals**
Laura R. Jarboe, Iowa State University, USA

32. **Efficient production of a model short peptide surfactant in high cell density *Escherichia coli* BL21(DE3) culture from sucrose feedstock**
Michele Bruschi, The University of Queensland, Australia

33. **Alkane-biofuel production with engineered cyanobacterial pathways**
András Pásztor, University of Turku, Finland

34. **Improvement of butanol production from xylose mother liquor by engineering xylose metabolic pathway in *Clostridium acetobutylicum* EA2018**
Yu Jiang, Chinese Academy of Sciences, China

35. **Development of recombinant Klebsiella pneumoniae for the enhanced 2,3-butanediol production**
Borim Kim, Sogang University, Korea

36. **Engineering corynebacterium glutamicum for L-Valine production**
Bastian Blombach, University of Stuttgart, Germany

37. **Genetic engineering to enhance the Ehrlich pathway and alter carbon flux for increased isobutanol production by Saccharomyces cerevisiae**
Jun Ishii, Kobe University, Japan

38. **Manipulation of the major lactococcal glucose-PTS properties by single base substitution**
Ana Rute Neves, Universidade Nova de Lisboa/Instituto de Biologia Experimental e Tecnológica (ITQB-UNL/IBET), Portugal

39. **Functional implementation of the posttranslational secb-seca protein targeting pathway in Bacillus subtilis**
Liuyang Diao, Chinese Academy of Sciences, China

40. **Predictive design of mrna translation initiation region to control prokaryotic translation efficiency**
Sang Woo Seo, Pohang University of Science and Technology (POSTECH), Korea

41. **Reprograming translational process for functional expression of heterologous enzymes in *Escherichia coli***
Byung Eun Min, Pohang University of Science and Technology (POSTECH), Korea

42. **Synthetic RNA devices to expedite evolution of metabolite-producing *Escherichia coli***
Jina Yang, Pohang University of Science and Technology (POSTECH), Korea

43. **In silico aid metabolic engineering design for improving strain performance of Bacillus subtilis on its representative products**
Tong Hao, Tianjin University, China

44. **In silico platform for rational heterologous pathway design of nonnative metabolites using genome-metabolic networks information**
Sunisa Chatsurachai, Osaka University, Japan

45. **Exo-metabolomics: An underestimated tool in systems biology**
Stephan Noack, Forschungszentrum Jülich GmbH, Germany

46. **A computational method for exploring extensive biosynthetic pathways**
Michihiro Araki, Kyoto University, Japan

47. **A multi- tissue genome-scale metabolic modeling for analysis of whole plant systems**
Cristiana G.O. Dal'Molin, The University of Queensland, Australia

48. **Development of Enterobacter aerogenes mutants for enhancing 2,3-butanediol production**
Moo-Young Jung, Korea university, Korea

49. **Evolving and engineering actinobacillus succinogenes for succinate production from lignocellulose hydrolysate**
Nikolas McPherson, Michigan State University, USA

50. **Identification of acetogenic 2,3-butanediol and lactate production pathways and reconstruction in metabolically engineered *E. coli***
Wendy Yiting Chen, LanzaTech NZ Ltd, New Zealand

51. **In vivo immobilization of lipase on the surface of polyhydroxybutyrate granule**
Taek Ho Yang, GS Caltex Corporation, Korea

52. **Metabolic engineering of *Escherichia coli* for the fumaric acid production by aerobic system**
Chan Woo Song, Korea Advanced Institute of Science and Technology (KAIST), Korea

53. **Production of isopropanol using recombinant Clostridium beijerinckii NCIMB 8052**
Seunghwan Lee, Korea Research Institute of Chemical Technology, Korea

54. **Metabolic engineering of *Escherichia coli* for the production of hydrocarbons**
Yong Jun Choi, Korea Advanced Institute of Science and Technology (KAIST), Korea

55. **Application of a transformation mediated chemically inducible chromosomal evolution (CICHE) method to biodiesel production in *saccharomyces cerevisiae***
Shuobo Shi, Chalmers University of Technology, Sweden

56. **A molecular transporter engineering approach to improving xylose catabolism in *Saccharomyces cerevisiae***
Hal Alper, The University of Texas at Austin, USA

57. **Exploring the metabolic burden response to the increased production of free fatty acids in Synechocystis sp. PCC 6803**
Christie A. M. Peebles, Colorado State University, USA

58. **Establishment of a markerless mutation delivery system in Bacillus subtilis stimulated by a double-strand break in the chromosome**
Zhiwen Wang, Tianjin University, China

59. **Metabolic engineering for oxaloacetate accumulation through pyruvate kinase deletion in Corynebacterium glutamicum**
Kazunori Sawada, Hokkaido University, Japan

60. **IMP accumulation in coryneform bacteria: A comparison of rational strain design and classical mutagenesis**
Konstantin Schneider, Saarland University, Germany

61. **Engineered pheromone communication for nutrient and quorum sensing in yeast**
Thomas C. Williams, The University of Queensland, Australia

62. **Population dynamics of pseudomonas putida kt2440 under iron stressed conditions**
Ralf Takors, University of Stuttgart, Germany

63. **Systems biology analysis of amylase producing yeast strains**
Zihe Liu, Chalmers University of Technology, Sweden

64. **System level analyses of trade-off mechanism in gal evolved mutants of yeast on glucose**
Kuk-Ki Hong, Chalmers University of Technology, Sweden

65. **Generation and characterization of *E. Coli* strains lacking PTS with modifications at the PEP-pyr node in order to increase the availability of PEP towards aromatic production coutilizing glucose and acetate**
Andrea Sabido, Universidad Nacional Autónoma de México., Mexico

66. **Fastpros: Screening method of multiple gene knockout for microbial production using genome-scale metabolic model**
Satoshi Ohno, Osaka University, Japan

67. **Ethanol reduces mitochondrial membrane integrity and thereby impacts carbon metabolism of Saccharomyces cerevisiae**
Ji-Min Woo, Ewha Womans University, Korea

68. **Genome-scale metabolic network reconstruction of a thermophilic bacterium Thermus thermophilus HB27**
NaRae Lee, Ewha Womans University, Korea

69. **Modeling growth, fluxes and cofactor turnover of all single enzyme deletion and overexpression mutants of *E.coli* central metabolism**
Joost Groot, University of Colorado Boulder, USA

70. **Systematic characterization of flux and network thermodynamic states for identification of metabolic engineering targets**
Keng Cher Soh, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

71. **Simplicity makes sense: A (straight) forward approach to modelling anaerobic yeast metabolism**
K.M. Bekers, Delft University of Technology, The Netherlands

72. **Single strand solid-phase cloning**
Magnus Lundqvist, Royal Institute of Technology (KTH), Sweden

73. **In silico atom labeling to trace and analyze the flux distribution metabolic networks**
Noushin Hadadi, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

74. **Production of 2,3-butanediol by Klebsiella oxytoca from glycerol**
Chelladurai Rathnasingh, GS Caltex Corporation, Korea

75. **Metabolic engineering of *Escherichia coli* for the production of polyhydroxyalkanoates incorporating 2-hydroxybutyrate**
Min Kyung Kim, Korea Advanced Institute of Science and Technology (KAIST), Korea

76. **Development of sucrose-utilizing *Escherichia coli* K-12 strain by introduction of ¥â-fructofuranosidases and its application for threonine production**
Sol Choi, Korea Advanced Institute of Science and Technology (KAIST), Korea

77. **Improvement of L-Arginine production by corynebacterium glutamicum through In silico-based metabolic engineering**
Seok Hyun Park, Korea Advanced Institute of Science and Technology (KAIST), Korea

78. **Systems metabolic engineering of *Escherichia coli* for the enhanced production of putrescine**
Sol Choi, Korea Advanced Institute of Science and Technology (KAIST), Korea

79. **Fed-batch fermentation of Lactobacillus rhamnosus for high concentration of lactic acid production from date juice**
Yongjun Choi, Korea Advanced Institute of Science and Technology (KAIST), Korea

80. **Transcriptome engineering of cyanobacteria for the production of chemicals and improved solvent tolerance**
Josefine Anfelt, Royal Institute of Technology (KTH), Sweden

81. **Metabolic engineering of *Escherichia coli* for the production of trans-4-Hydroxy-L-Proline**
Eleni Theodosiou, TU Dortmund University, Germany

82. **Metabolic engineering for optimizing NADPH dependent 3HP production in *Saccharomyces cerevisiae***
Niels Bjerg Jensen, Technical University of Denmark, Denmark

83. **Shmks1 and II are plant enzymes sufficient for *E. Coli* to produce methylketones**
Geng Yu, The University of Michigan, USA

84. **Efficient vanillin synthesis through engineering auto-regulatory genetic circuits in Escherichia coli**
Tat-Ming Samuel Lo, Nanyang Technological University, Singapore

85. **Developing a platform cell factory through engineering of yeast acetyl-coa metabolism**
Yun Chen, Chalmers University of Technology, Sweden

86. **Efficient screening a high glutathione-content mutant of Saccharomyces cerevisiae by flow cytometry**
Zheng Wang, Beijing University of Chemical Technology, China

87. **Engineering Actinobacillus succinogenes for succinate production from glycerol**
Claire Vieille, Michigan State University, USA

88. **Evaluation of different metabolic routes for 3-hydroxypropionic acid production in Saccharomyces cerevisiae**
Irina Borodina, Technical University of Denmark, Denmark

89. **Engineering yeast to produce natural flavors and active pharmaceutical ingredients from fatty acids**
Jens Schrader, DECHEMA Research Institute, Germany

90. **Recombinant production of lipophilic compounds (tocotrienol and astaxanthin) in recombinant *Escherichia coli* strains**
Georg A. Sprenger, University of Stuttgart, Germany

91. **Engineering a fatty yeast for renewable production of carotenoids**
Adam G Lawrence, DSM Nutritional Products, USA

92. **Metabolic engineering of *Escherichia coli* for the fumaric acid production by aerobic system**
Chan Woo Song, Korea Advanced Institute of Science and Technology (KAIST), Korea

93. **Modulation of endogenous pathways enhances bioethanol yield and productivity in *Escherichia coli***
Neha Munjal, International Centre for Genetic Engineering and Biotechnology, India

94. **Engineering of Clostridium acetobutylicum ATCC 824 towards a mixed alcohol producer**
Sang Yup Lee, Institute for the BioCentury, Korea

95. **Overexpression of NADH -dependent fumarate reductase in xylose fermenting *Saccharomyces cerevisiae***
Laura Salusjärvi, VTT Technical Research Centre of Finland, Finland

96. **Biological hydrogen production beyond current limits**
Sebastiaan K. Spaans, Wageningen University, The Netherlands

97. **Assessing the relative potential of biosynthetic pathways for advanced biofuels and bio-based products**
Deepak Dugar, Massachusetts Institute of Technology, USA

98. **Pathways for synthesis of advanced biofuels**
Deepak Dugar, Massachusetts Institute of Technology, USA

99. **Yeast development for cellulosic ethanol production**
Marja Ilmén, VTT Technical Research Centre of Finland, Finland

100. **Toward development of an optimal modular cell for production of chemicals and biofuels**
Cong T. Trinh, University of Tennessee, USA

101. **A metabolic pathway module for formate conversion to biofuel precursors in *Escherichia coli***
Amanda Lee Smith, University of Washington, USA

102. **Reduction of glycerol formation during anaerobic growth of a *Saccharomcyes cerevisiae* strain engineered to produce formate**
D. Aaron Argyros, Mascoma Corporation, USA

103. **The metabolic load of recombinant protein expression in CHO cells**
Zahra Sheikholeslami, Ecole Polytechnique de Montreal, Canada

104. **Control of a long-duration high-density perfusion cell culture using continuous oxygen uptake rate**
Jason Walther, Genzyme, a Sanofi Company, USA

105. **Metabolic flux analysis of HEK293 cells producing viral vectors for gene therapy against alcoholism**
Barbara Andrews, University of Chile, Chile

106. **Fluxome profilling of CHO cells under different productive states**
Tiago M. Duarte, IBET/ITQB-UNL, Portugal

107. **Selecting thermophilic bacilli as hosts for white biotechnology applications**
Elleke F. Bosma, Wageningen University, The Netherlands

108. **Synthetic metabolic engineering of corynebacterium glutamicum for bio-based production of 1,5-diaminopentane**
Stefanie Kind, Technische Universität Braunschweig, Germany

109. **Unravelling the Leloir pathway in bifidobacterium bifidum**
Frederik De Bruyn, Ghent University, Belgium

110. **Producing 1-octanol and tolerating n-butanol with Pseudomonas putida in industry-like applications**
Ralf Takors, University of Stuttgart, Germany

111. **Enhanced production of native-sized recombinant spider dragline silk protein in *Escherichia coli* through synthetic biology approach using orthogonal ribosome**
Hannah Chung, Korea Advanced Institute of Science and Technology (KAIST), Korea

112. **DNA guided assembly line**
Rok Gaber, National institute of Chemistry, Slovenia

113. **Oligo-based Gibson assembly – a new way of creating expression variability**
Pieter Coussement, Ghent University, Belgium

114. **Engineering the transcription machinery of *E. coli* to enable efficient functional screening of heterologous or metagenomic libraries**
Stefan M. Gaida, University of Delaware, USA

115. **The development of a genetically encoded, function-based taxol biosensor**
George McArthur IV, Imperial College London, United Kingdom

116. **Systems metabolic engineering of *Escherichia coli* W for L-valine production**
Sang Yup Lee, Institute for the BioCentury, Korea

117. **Systems-level analysis of baculovirus-host interactions: From genomic to metabolomic decomposition**
Francisca Monteiro, Universidade Nova de Lisboa/Instituto de Biologia Experimental e Tecnológica (ITQB-UNL/IBET), Portugal

118. **The impact of respiratory regulation on heterologous protein production in *Saccharomyces cerevisiae***
José L. Martínez, Chalmers University of Technology, Sweden

119. **Metabolic control analysis of the central carbon pathway in optimally grown *E. coli***
Stefano Andreozzi, École Polytechnique Fédérale De Lausanne (EPFL), Switzerland

120. **The metabolic response to stepwise ethanol increase in *S. Cerevisiae***
K.M. Bekers, Delft University of Technology, The Netherlands

121. **Quantitative relationship between gene expression and metabolite levels is jointly determined by reaction mechanism and network connectivity**
Aleksej Zelezniak, European Molecular Biology Laboratory, Germany

122. **Interrelation between 4-hydroxyproline production and the central carbon metabolism in recombinant Escherichia coli expressing 2-oxoglutarate-dependent proline-4-hydroxylase**
Oliver Frick, Technical University Dortmund , Germany

123. **Smart, small metabolite regulated, promoters for optimizing *Saccharomyces cerevisiae* industrial bioprocesses**
Jérôme Maury, Technical University of Denmark, Denmark

124. **Towards a platform organism for terpenoid production – in silico comparison of *E. Coli* and *S. Cerevisiae* as potential hosts**
Evamaria Gruchattka, Technical University Dortmund University, Germany

125. **Are genes regulated or constitutive? An experimental-based contribution**
Martin Siemann-Herzberg, University Stuttgart, Germany

126. **Metabolic model-based prediction of engineering targets for increased production of heterologous proteins**
Justyna Nocon, University of Natural Resources and Life Sciences, Austria

127. **Identification of flux profiles from dynamic labeling experiments: *S. Cerevisiae* cultivation under fast feast/famine conditions**
C. Suarez-Mendez, Delft University of Technology, The Netherlands

128. **Flux regulation at a primary metabolic node: Lessons for acetyl-coa derived products**
Karthik Sekar, Northwestern University, USA

129. **Scaffolding platform for expression of P450 enzymes**
Ulla Christensen, Technical University of Denmark, Denmark

130. **Metabolomic and metabolic flux profiling of recombinant Pichia pastoris growing on glucose:methanol mixtures**
Pau Ferrer, Universitat Autònoma de Barcelona, Spain

131. **Comparison of the productivity of a new human cell line in different steady states of continuous cultivations using MFA**
Susann Freund, Max Planck Institute for Dynamics of Complex Technical Systems, Germany

132. **A quantitative metabolomics study of the oxygen availability impact on recombinant Pichia pastoris central carbon metabolism**
Pau Ferrer, Universitat Autònoma de Barcelona, Spain

133. **Metabolomics and 13C-metabolic flux analysis of a xylose-consuming *Saccharomyces cerevisiae* strain under aerobic and anaerobic conditions**
Thomas Wasylenko, Massachusetts Institute of Technology, United States

134. **Systems biotechnology of Bacillus megaterium for recombinant protein production**
Florian David, Technische Universität Braunschweig, Germany

135. **Combining rational and evolutionary approaches to optimize enzyme activity in *Saccharomyces cerevisiae***
Joshua K. Michener, California Institute of Technology, USA

136. **Understanding in-vivo kinetics and transport through stimulus response experiments: Penicillium chrysogenum as host strain**
Amit T. Deshmukh, Delft University of Technology, The Netherlands

137. **Pooled segregant whole-genome sequence analysis: A novel method for inverse metabolic engineering of Saccharomyces cerevisiae**
Georg Hubmann, Katholieke Universiteit Leuven, Belgium

138. **Rapid manufacture of custom TAL effectors for genomic editing and genetic circuits.**
Michael Poderycki, Life Technologies Corporation, USA

139. **Systems biology in Synechocystis sp. PCC 6803**
Katsunori Yoshikawa, Osaka University, Japan

140. **Estimation of metabolic rewiring of CHO cell metabolism from growth phase to non-growth phase by multiple isotopic tracers and mass spectrometry**
Woo Suk Ahn, University of Delaware, USA

141. **Mapping photoautotrophic metabolism with isotopically nonstationary ^{13}C flux analysis**
Jamey D. Young, Vanderbilt University, USA

142. **Computational design of new enzyme building blocks for novel metabolic pathways**
Alexandre Zanghellini, Arzeda Corporation, USA

143. **Shikimate pathway engineering for the production of aromatic building blocks in *Saccharomyces cerevisiae***
Jens O Krömer, The University of Queensland, Australia

144. **RELATCH: A new computational tool for predicting metabolic responses to genetic and environmental perturbations**
Jennifer L. Reed, University of Wisconsin-Madison, USA

145. **Novel computational strain optimization approaches for increasing the productivity of microorganisms**
Oliver Hädicke, Max Planck Institute for Dynamics of Complex Technical Systems, Germany

146. **Design, assembly, editing and interspecies transfer of genetic constructs for synthetic biology engineering**
Federico Katzen, Life Technologies Corporation, USA

147. **Sequence analysis of the L-Arginine biosynthesis gene cluster and metabolic engineering in Corynebacterium crenatum**
Zhiming Rao, Jiangnan University, China

148. **Thermodynamic based choice of metabolic engineering strategies**
Sergio Bordel, Chalmers University of Technology, Sweden

149. **Sequencing of a genome shuffled *S. cerevisiae* strain to generate inverse engineering targets for lignocellulosic substrate inhibitor tolerance**
Dominic Pinel, Concordia University, Canada

150. **A second-generation uracil-excision molecular cloning standard for metabolic engineering**
Morten Nørholm, Technical University of Denmark, Denmark

151. **Synthetic metabolons facilitate substrate channeling and pathway regulation**
Y-H Percival Zhang, Virginia Tech, USA

152. **Theoretical yield biofuels production through *in vitro* metabolic engineering**
Y-H Percival Zhang, Virginia Tech, USA

153. **A cell factory of Bacillus subtilis engineered for the simple bioconversion of myo-inositol to scyllo-inositol, a potential therapeutic agent for Alzheimer's disease**
Ken-ichi Yoshida, Kobe University, Japan

154. **Use of transcription factors to visualize small-molecules at the single cell level, and application to metabolic engineering**
Lothar Eggeling, Forschungszentrum Jülich GmbH, Germany

155. **Genome-scale robust strain design**
Patrick Hyland, University of Toronto, Canada

156. **Improved product-per-glucose yield in a reductive whole-cell biotransformation with *Escherichia coli***
Solvej Siedler, Forschungszentrum Juelich GmbH, Germany

157. **MetaFlux: A tool for completing and constructing flux balance models**
Mario Latendresse, SRI International, USA

158. **Rational cell design for small molecule synthesis by pseudomonas putida**
Lars M. Blank, RWTH Aachen University, Germany

159. **Buried under a plethora of elementary modes - integer programming comes to the rescue**
Christian Jungreuthmayer, Austrian Centre of Industrial Biotechnology (ACIB), Austria

160. **The protein acetylation pathway and central metabolism of *Escherichia coli*: The role of cAMP on regulation**
Vicente Bernal, University of Murcia, Spain

161. **Using heat shock proteins (hsps) to enhance recombinant protein production in CHO cells**
Janice G. L. Tan, Bioprocessing Technology Institute, Singapore

162. **Insights to improve microalgae as direct bioethanol producer**
Marie Demuez, IMDEA Energy, Spain

163. **Engineering of recombinant protein secretion based on systems biology**
Diethard Mattanovich, University of Natural Resources and Life Sciences, Austria

164. **Metabolic engineering in silico enabled by genome-scale models with flux ratio constraints**
Ryan S. Senger, Virginia Tech, USA

165. **Metabolic engineering for high-level styrene biosynthesis**
Oliver Yu, Wuxi New Way Biotechnology Ltd., China

166. **Metabolic engineering to increase production of malonyl-CoA derived products**
Ron Evans, OPX Biotechnologies, Inc., USA

167. **Novel codon optimization approach towards designing synthetic genes for metabolic pathway engineering**
Dong-Yup Lee, National University of Singapore, Singapore

168. **Novel tools for dynamic 13C-metabolic flux analysis: Tandem mass spectrometry and parallel labeling experiments**
Maciek R. Antoniewicz, University of Delaware, USA

169. **Reconstruction of genome-scale metabolic network of Bacillus subtilis - iBsu1140 and its application on *in vivo* metabolic engineering design**
Tong Hao, Tianjin University, China

170. **Regularization of inverse problems in metabolic engineering: A novel approach**
Juan A. Asenjo, University of Chile, Chile

171. **Tailoring Corynebacterium glutamicum for L-lysine production by systems metabolic engineering**
Judith Becker, Technische Universität Braunschweig, Germany

172. **Sustainable production of major industrial chemicals using microbial biocatalysts: 1,4-butanediol**
Mark Burk, Genomatica, USA

173. **RibM from Streptomyces davawensis is a riboflavin/roseoflavin transporter and may be useful for the optimization of riboflavin production strains**
Matthias Mack, Mannheim University of Applied Sciences, Germany

174. **The construction of engineered *Saccharomyces cerevisiae* lead to increased ethanol productivity from blending of glucose and xylose**
Elis Eleutherio, UFRJ, Brazil

175. **Metabolite sensors for single-cell isolation of producing bacteria**
Lothar Eggeling, Forschungszentrum Juelich GmbH, Germany

176. **Using redox potential for strain improvement: from engineering to global understanding**
Yanping Zhang, Chinese Academy of Sciences, China

177. **A method to reduce quenching to 10 seconds in mammalian suspension cell cultures**
Juan A. Hernández Bort, ACIB GmbH, Austrian Centre of Industrial Biotechnology, Austria

178. **Enhanced succinate production by *Mannheimia succiniciproducens* using integrated multi-omics strategy**
Chan Woo Song, Korea Advanced Institute of Science and Technology (KAIST), Korea

179. **Simultaneously and selectively removing sulfur and nitrogen contaminants from fossil fuels by synthetic biotechnology**
Bo Yu, Chinese Academy of Sciences, China

180. **Metabolic engineering of *Escherichia coli* for the production of 1-propanol**
Yong jun Choi, Korea Advanced Institute of Science and Technology (KAIST), Korea

181. **A robotic platform for high-throughput fluxome analysis**
Stéphanie Heux, LISBP-INSA Toulouse, France

182. **Biosynthesis of polylactic acid and its copolymers in recombinant *e. coli***
Min Kyung Kim, Korea Advanced Institute of Science and Technology (KAIST), Korea

183. **Metabolic engineering for the production of malate using high succinic acid producer**
Sol Choi, Korea Advanced Institute of Science and Technology (KAIST), Korea

184. **Metabolic Engineering of *Escherichia coli* and *Corynebacterium glutamicum* for the production of 1,5-diaminopentane**
Seok Hyun Park, Korea Advanced Institute of Science and Technology (KAIST), Korea

185. **Metabolic flux based improvement of α1-antitrypsin production in the human cell line AGE1.HN**
Jens Niklas, Insilico Biotechnology AG, Germany

186. **Calculation of constrained minimal cut sets including regulatory information by the utilization of binary linear programming**
Christian Jungreuthmayer, Austrian Centre of Industrial Biotechnology (ACIB), Austria

187. **Recombinant whole cell production of human tetrahydrocannabinol metabolites**
Torsten Tobias Arndt, Technische Universität Dortmund, Germany

188. **Predictive metabolic network models for industrial bioprocesses – accelerating process design and improving host cell engineering**
Jens Niklas, Insilico Biotechnology AG, Germany

189. **Metabolic engineering of *E. coli* for the production of UDP-glucose using permeabilized cells**
Christian Weyler, Saarland University, Germany

190. **Identification and characterization of a novel diterpene gene cluster in *Aspergillus nidulans***
Mervi Toivari, VTT, Finland

191. **Exploring the allosteric mechanism of dihydrodipicolinate synthase by reverse engineering of the allosteric inhibitor binding sites and its application for lysine production**
Zhen Chen, Hamburg University of Technology, Germany

192. **Proteomic analysis and manipulation of the central metabolism for optimizing the production of optically active (R,R)-2,3-butanediol by *Paenibacillus polymyxa***
Wei Wang, Hamburg University of Technology, Germany

193. **Expanding the feedstock range: Bio-inspired engineering of microbial producer strains for the production of value products from renewable and waste carbon streams**
Jörg Mampel, Biotechnology Research and Information Network AG (B.R.I.A.N.), Germany

194. **Exploring the allosteric mechanism of dihydrodipicolinate synthase by reverse engineering of the allosteric inhibitor binding sites and its application for lysine production**
Zhen Chen, Hamburg University of Technology, Germany

195. **Enhanced butyric acid productivity by 2-deoxy-D-glucose-adapted Clostridium tyrobutyricum on glucose and xylose mixtures with non-diauxic growth**
Han Min Woo, Korea Institute of Science and Technology, Republic of Korea

196. **Bio-based production of polyamide 6 and polyamide 6,6 monomers**
Liang Wu, DSM Biotechnology Center, The Netherlands

197. **Improvement of butanol production from xylose mother liquor by engineering xylose metabolic pathway in Clostridium acetobutylicum EA2018**
Yu Jiang, Chinese Academy of Sciences, China

198. **The metabolic response to stepwise ethanol increase in S. cerevisiae,**
K.M. Bekers, Delft University of Technology, The Netherlands

199. **Metabolic changes in murine and human cardiomyocytes induced by subtoxic concentrations of doxorubicin**
Elmar Heinzle, Saarland University, Germany

200. **Quantitative quenching evaluation and direct intracellular metabolite analysis of penicillium chrysogenum industrial production cultivations**
Timo Hardiman, Sandoz GmbH, SU Development Anti-Infectives, Austria

201. **Metabolic engineering for pathway rewiring and enhancement of spinosyn biosynthesis in Saccharopolyspora spinosa**
Babu Raman, Dow AgroSciences, USA

202. **Analysis of constraint based in silico metabolic model of rhodococcus erythropolis for efficient biodesulfurization**
Dong-Yup Lee, National University of Singapore, Singapore

203. **Mammalian systems biotechnology for characterizing CHO cell and HESC cultures**
Dong-Yup Lee, National University of Singapore, Singapore

204. **Discovery of a yet unknown mammalian pathway linking metabolism to immunity: Immune response gene 1 (IRG1) catalyzes the synthesis of the antimicrobial compound itaconic acid**
Thekla Cordes, University of Luxembourg, Luxembourg

205. **Unraveling *in vivo* kinetics of penicillin biosynthesis pathway**
Amit T. Deshmukh, Delft University of Technology, The Netherlands

206. **New insights into substrate supply and regulation of FK506 biosynthesis and their implications for bioprocess development and drug discovery**
Gregor Kosec, Acies Bio d.o.o., Slovenia

207. **Flux and metabolite flexibility in Escherichia coli at seconds time scale in response to rapid shifts of substrate excess**
Walter M. van Gulik, Delft University of Technology, The Netherlands

208. **Combination of metabolic engineering and enzyme fusion technology for Improved production of amorphadiene in *Saccharomyces cerevisiae***
Rama Raju Baadhe, National Institute of Technology, INDIA

209. **Application of metabolome data and thermodynamics for the development of efficient xylose-fermenting *Saccharomyces cerevisiae***
Basti Bergdahl, Lund University, Sweden

210. **Enhanced xylan degradation and xylitol production by *Candida tropicalis* overexpressing fungal xylanase**
Chun Li, Beijing Institute of Technology, China

211. **Use both rational metabolic engineering and adaptive evolutionary to select an efficient *E. coli* cell factory for the production of 1.3-propanediol from glucose**
Liang Tian, LISBP-INSA Toulouse, France

212. **In vivo carbon fluxes in *schizosaccharomyces pombe*: Applying ^{13}C metabolic flux analysis in parallel small-scale continuous cultivations**
Tobias Klein, Saarland University, Germany

213. **New molecular toolkit for yeast engineering**
Gregory Stephanopoulos, Massachusetts Institute of Technology, USA