



biocat2014
HAMBURG

7th INTERNATIONAL CONGRESS ON BIOCATALYSIS

CONGRESS PROGRAM

August 31 – September 4 · 2014

HAMBURG UNIVERSITY OF TECHNOLOGY, GERMANY

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An-Ping Zeng Hamburg University of Technology, Germany

SUNDAY, AUGUST 31

SCIENTIFIC PROGRAM

BUILDING A

15:30 – 17:00 Registration

AUDIMAX II

17:00 Opening ceremony

Garabed Antranikian, Chairman of the Congress, President of the TUHH

Music by: **Ensemble Formidable**, Special Guest **Ulita Knaus**

Le sacre du printemps (excerpt), Igor Stravinsky

María de Buenos Aires (excerpt), Ástor Piazzolla

Favela, Latin Jazz

Karolina kom, Klezmer

Kazimierz, Balkan Jazz

Le quattro stagioni (The Four Seasons) (excerpt), Antonio Vivaldi

O Son do Ar, Irish Folk

Opening lectures

17:45 – 18:15 **Vincent Eijsink**, Norwegian University of Life Sciences, Ås, Norway

"Novel tools for biomass processing – Oxidative cleavage of polysaccharides by lytic polysaccharide monooxygenases"

18:15 – 18:45 **Gjalt Huisman**, Codexis, Redwood City, USA

"Innovations in biocatalysis for pharmaceutical applications"

19:00 – 22:00 Welcome reception at the Hamburg University of Technology (TUHH)

MONDAY, SEPTEMBER 1

AUDIMAX II

8:30 – 10:30	MORNING SESSION I – CHAIRPERSON: KARL-HEINZ MAURER, AB Enzymes, Germany Enzyme discovery, production and application
8:30 – 9:00	Martin S. Borchert, Novozymes A/S, Bagsværd, Denmark "Hyperthermophilic enzymes and their industrial applications. A plea for more diversity"
9:00 – 9:30	Anett Schallmeyer, University of Amsterdam, Amsterdam, The Netherlands " <i>In silico</i> discovery of novel enzymes for industrial biotechnology"
9:30 – 10:00	Kerstin Steiner, Austrian Centre of Industrial Biotechnology, Graz, Austria "The potential of enzymes with cupin fold in biocatalysis"
10:00 – 10:30	Gideon Grogan, University of York, York, Great Britain "Structure, mechanism and application of NADPH-dependent Imine Reductases (IREDs) "
10:30 – 11:00	Coffee break

MONDAY, SEPTEMBER 1

AUDIMAX II

11:00 – 13:00 **MORNING SESSION II – CHAIRPERSON: YASUHISA ASANO,**
 Toyama Prefectural University, Japan

Structure-function analysis and enzyme design

11:00 – 11:20 **Jürgen Pleiss**, University of Stuttgart, Stuttgart, Germany
 "Systematic analysis of sequences and structures of thiamine diphosphate-dependent enzymes"

11:20 – 11:40 **Christoph Loderer**, Technical University Dresden, Dresden, Germany
 "Investigation of structural determinants for substrate specificity in zinc dependent alcohol dehydrogenases"

11:40 – 12:00 **Spyros Chatziefthimiou**, EMBL, Hamburg, Germany
 "The structure of a thermoactive lipase from *Thermoanaerobacter thermohydrosulfuricus*: snapshots of the lipase mechanism"

Enzymatic and whole cell biotransformations

12:00 – 12:20 **Jan Deska**, University of Cologne, Cologne, Germany
 "Achmatowicz goes green – oxidative ring rearrangements based on oxygen-activating enzymes"

12:20 – 12:40 **Frank Hollmann**, Delft University of Technology, Delft, The Netherlands
 "Photocatalysis enables using water as sacrificial electron donor in redox biocatalysis"

12:40 – 13:00 **Florian Rudroff**, Vienna University of Technology, Vienna, Austria
 "An enzymatic 'in vivo' toolbox for RedOx cascade reactions: from feedstock limonene to biorenewable polyesters"

13:00 – 14:30 Lunch at Mensa

14:15 – 14:30 Coffee break in Building A

MONDAY, SEPTEMBER 1

BUILDING A

14:30 – 15:15 **LIGHTNING TALKS – CHAIRPERSON: ANDREAS LIESE,**
Hamburg University of Technology, Germany

Enzymatic and whole cell biotransformations (P3-1 to P3-9)

parallel
14:30 – 15:30 **Poster session** (P1-1 to P1-81)

Enzyme discovery, production and application

15:30 – 16:30 **Poster session** (P3-1 to P3-103 / P5-1 to P5-27)

Enzymatic and whole cell biotransformations / Sustainable industrial processes

MONDAY, SEPTEMBER 1

AUDIMAX II

16:30 – 16:50 Coffee break

16:50 – 18:30 **AFTERNOON SESSION – CHAIRPERSON: IVAN LAVENDERA, UNIVERSITY OF OVIEDO, SPAIN**

Bioprocess engineering and downstream processing

16:50 – 17:10 **Cormac Murphy**, University College Dublin, Dublin, Ireland
 "Biocatalysis with filamentous fungal biofilms"

17:10 – 17:30 **Winnie Dejonghe**, Flemish Institute for Technological Research, Mol, Belgium
 "Galacto-oligosaccharide production in a mixed matrix membrane reactor"

17:30 – 17:50 **Sonja Borchert**, Enzymicals AG, Greifswald, Germany
 "Scale-up of a recombinant pig liver esterase-catalyzed desymmetrization of dimethyl cyclohex-4-ene-*cis*-1,2-dicarboxylate"

Enzymatic and whole cell biotransformations

17:50 – 18:10 **Jan von Langermann**, University of Rostock, Rostock, Germany
 "Hxdroxnitrile lyase-catalyzed synthesis of enantiopure cyanohydrins in biocatalytic active static emulsions (BASE)"

18:10 – 18:30 **Christoph Syldatk**, Karlsruhe Institute of Technology, Karlsruhe, Germany
 "Enzymatic synthesis of surface-active glycolipids - state of the art and challenges"

TUESDAY, SEPTEMBER 2

AUDIMAX II

8:30 – 10:30	MORNING SESSION I – CHAIRPERSON: GJALT HUISMAN, Codexis, USA Bioprocess engineering and downstream processing
8:30 – 9:00	Alex Zaks, Akermis Inc., St. Louis, USA "Advanced low energy enzyme-catalyzed capture of CO ₂ "
9:00 – 09:30	Zongbao Zhao, Dalian Institute of Chemical Physics, Dalian, China "Microbial lipid production by oleaginous yeasts"
9:30 – 10:00	Ivan Lavandera, University of Oviedo, Oviedo, Spain "Biocatalytic tandem and dynamic processes applied to the synthesis of high-added value derivatives"
10:00 - 10:30	Carlos M. G. A. Fontes, University of Lisbon, Lisbon, Portugal "Mining <i>Ruminococcus flavefaciens</i> cellulosome to discover novel Carbohydrate Active enZYmes (CAZYmes) and Carbohydrate Binding Modules (CBMs)"
10:30 – 11:00	Coffee break

TUESDAY, SEPTEMBER 2

AUDIMAX II

11:00 – 12:40 **MORNING SESSION II – CHAIRPERSON: MARTIN BORCHERT,**
Novozymes A/S, Denmark

Sustainable industrial processes

11:00 – 11:20 **Roger Sheldon,** Delft University of Technology, Delft, The Netherlands
"Industrial application of glucoamylase Cross-Linked Enzyme Aggregates (CLEAs) in starch processing"

11:20 – 11:40 **Stefan Marcus Gaida,** Fraunhofer IME, Aachen, Germany
"Targeted proteomics enabled metabolic engineering of *Clostridium cellulolyticum* for n-butanol production"

11:40 – 12:00 **Michael J. Fink,** Vienna University of Technology, Vienna, Austria
"Scalable chemo-enzymatic synthesis of polyamide-9 monomers"

12:00 – 12:20 **Katarzyna Wrzosek,** Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany
"Resolution of mandelic acid enantiomers using enantioselective chromatography coupled with enzymatic racemization"

12:20 – 12:40 **Carlos Diaz Blanco,** Polytechnic University of Catalonia, Terrassa, Spain
"Building a dual antimicrobial/antifouling coating on urinary catheters using a laccase-triggered bottom-up approach"

12:40 – 14:15 Lunch at Mensa

14:00 – 14:15 Coffee break in Building A

TUESDAY, SEPTEMBER 2

BUILDING A

14:15 – 14:45 **LIGHTNING TALKS – CHAIRPERSON: ANDREAS LIESE,**
Hamburg University of Technology, Germany

Structure-function analysis and enzyme design (P2-1 to P2-5)
Bioprocess engineering and downstream processing (P4-2 to P4-4)

parallel
14:15 – 15:15 **Poster session** (P3-1 to P3-103)

Enzymatic and whole cell biotransformations

15:00 – 15:45 **Poster session** (P2-1 to P2-39 / P4-1 to P4-30)

Structure-function analysis and enzyme design /
Bioprocess engineering and downstream processing

AUDIMAX II

15:45 – 16:00 Coffee break

16:00 – 17:00 **AFTERNOON SESSION – CHAIRPERSON: KERSTIN STEINER,**
Austrian Centre of Industrial Biotechnology, Austria

Enzymatic and whole cell biotransformations

16:00 – 16:20 **Isaac Vizcaino-Caston,** The University of Birmingham, Birmingham, UK
"Engineered *E. coli* biofilms as a platform for biocatalysis"

16:20 – 16:40 **Jessica Rehdorf,** BRAIN AG, Zwingenberg, Germany
"Multistep enzyme conversion: exploring bacterial microcompartments"

16:40 – 17:00 **Stephanie Klatte,** Bielefeld University, Germany
"Redox self-sufficient amination of alcohols by an *E. coli* whole cell biotransformation system"

17:00 Group photo

17:15 Excursion and congress dinner on a boat

Biocat-Award ceremony

WEDNESDAY, SEPTEMBER 3

AUDIMAX II

9:00 – 11:00 **MORNING SESSION I – CHAIRPERSON: MOSÈ ROSSI,**
University of Naples, Italy

Enzymatic and whole cell biotransformations

9:00 – 9:30 **Michihiro Araki,** Kobe University, Kobe, Japan
"Computational platform for designing synthetic metabolic pathways"

9:30 – 10:00 **Dörte Rother,** Forschungszentrum Jülich, Jülich, Germany
"Synthetic enzyme cascades for the production of valuable building blocks with multi-chiral centers – new approaches to increase economic and ecologic efficiency"

10:00 – 10:30 **Shota Atsumi,** University of California, Davis, USA
"Biological conversion of sugar and CO₂ to chemicals"

Sustainable industrial processes

10:30 – 11:00 **Ulrich Kettling,** Clariant, Munich, Germany
"Trends in industrial biocatalysis based on multi-enzyme concepts"

11:00 – 11:30 Coffee break

WEDNESDAY, SEPTEMBER 3

AUDIMAX II

11:30 – 13:30 **MORNING SESSION II – CHAIRPERSON: PIERRE MONSAN,**
National Institute of Applied Science, France

Structure-function analysis and enzyme design

11:30 – 11:50 **Simon Ladevèze**, University of Toulouse, Toulouse, France
"Functional metagenomics reveals novel pathways of carbohydrate foraging by human gut bacteria"

11:50 – 12:10 **Marcelo Masman**, Groningen Biomolecular Science and Biochemistry Institute, Groningen, The Netherlands
"Loop engineering in enzymes: fine-tuning reaction specificity"

12:10 – 12:30 **Hanna M. Dudek**, University of Groningen, Groningen, The Netherlands
"Extended substrate scope of a Baeyer-Villiger monooxygenase engineered by multiple-site mutagenesis"

12:30 – 12:50 **Kristyna Slámová**, Institute of Microbiology, Prague, Czech Republic
"The first transglycosidase derived from a β -N-acetylhexosaminidase"

Enzymatic and whole cell biotransformations

12:50 – 13:10 **Yufeng Miao**, Department of Pharmaceutical Biology, Groningen, The Netherlands
"Biocatalytic Michael-type additions yielding enantioenriched precursors of GABA-based pharmaceuticals"

13:10 – 13:30 **Kersten S. Rabe**, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany
"A new reporter protein for extremophiles"

13:30 – 15:00 Lunch at Mensa

14:45 – 15:00 Coffee break in Building A



WEDNESDAY, SEPTEMBER 3

BUILDING A

15:00 – 15:45 **LIGHTNING TALKS – CHAIRPERSON: ANDREAS LIESE,**
Hamburg University of Technology, Germany

Enzyme discovery, production and application (P1-1 to P1-7)
Sustainable industrial processes (P5-2 to P5-4)

parallel
15:00 – 16:00 **Poster session** (P2-1 to P2-39 / P4-1 to P4-30)

Structure-function analysis and enzyme design /
Bioprocess engineering and downstream processing

16:00 – 17:00 **Poster session** (P1-1 to P1-81 / P5-1 to P5-27)

Enzyme discovery, production and application / Sustainable industrial processes

AUDIMAX II

17:00 – 17:20 Coffee break

17:20 – 18:40 **AFTERNOON SESSION – CHAIRPERSON: MARCO MORACCI,**
CNR Institute of Protein Biochemistry, Italy

Enzyme discovery, production and application

17:20 – 17:40 **Alexander Pisarchik,** Arzeda Inc, Seattle, USA
"Computational design for the development of novel enzymes and biosynthetic pathways"

17:40 – 18:00 **Yuval Nov,** University of Haifa, Haifa, Israel
"The annealing bias in saturation mutagenesis"

18:00 – 18:20 **Martin Schuermann,** DSM Chemical Technology R&D, Geleen, The Netherlands
"Selective and sustainable P450 oxygenation technology for intermediate manufacturing on kilogram scale"

18:20 – 18:40 **Yutaka Kawarabayasi,** Kyushu University, Fukuoka, Japan
"Experimental confirmation of the archaeal UDP-GlcNAc biosynthetic pathway unpredicted from the genomic data"

THURSDAY, SEPTEMBER 4

AUDIMAX II

8:30 – 10:30 **MORNING SESSION I – CHAIRPERSON: HARUYUKI ATOMI,**
Kyoto University, Japan

Sustainable industrial processes

8:30 – 9:00 **Herman Pel,** DSM Biotech Center, Delft, The Netherlands
"Optimizing enzyme cocktails and process conditions for production of
cellulosic ethanol"

Structure-function analysis and enzyme design

9:00 – 9:30 **Nediljko Budisa,** Technical University Berlin, Berlin, Germany
"Orthogonal translation as a tool for designing biocatalysts"

9:30 – 10:00 **Magali Remaud-Simeon,** LISBP/INSA, Toulouse, France
"Sweet advances in glucanase discovery and design for novel products"

10:00 – 10:30 **Gerrit Poelarends,** University of Groningen, Groningen, The Netherlands
"Discovery and engineering of new enzymes for carbon-nitrogen bond
formation"

10:30 – 11:00 Coffee break

THURSDAY, SEPTEMBER 4

AUDIMAX II

- 11:00 – 13:20** **MORNING SESSION II – CHAIRPERSON: MAGALI REMAUD-SIMEON,**
 LISBP/INSA, France
- Enzyme discovery, production and application**
- 11:00 – 11:20** **Christian Degering,** evocatal GmbH, Monheim am Rhein, Germany
 "Improvement of biocatalysts for industrial applications"
- 11:20 – 11:40** **Solvej Siedler,** Technical University Denmark, Horsholm, Denmark
 "Biosensors open the door for ultra-high-throughput screening of NADPH-dependent enzymes and flavonoid production in *E. coli*"
- 11:40 – 12:00** **Xu-Dong Kong,** East China University of Science and Technology, Shanghai, China
 "A smart library of epoxide hydrolase variants for chemoenzymatic synthesis of (*R*)- and (*S*)- β -blockers"
- 12:00 – 12:20** **Alessandro Pellis,** University of Natural Resources and Life Sciences, Vienna, Austria
 "Lipase-catalyzed functionalization of poly(L-lactic acid) films"
- 12:20 – 12:40** **Robert Kourist,** Ruhr-University Bochum, Bochum, Germany
 "Photobiocatalytic decarboxylation of fatty acids for olefine synthesis"
- 12:40 – 13:00** **Susanne Lischka,** BAM Federal Institute for Materials Research and Testing, Berlin, Germany
 "Enzyme-catalyzed synthesis of biolubricants from waste fat"
- 13:00 – 13:20** **Marco Moracci,** National Research Council, Naples, Italy
 "Exploring and exploiting by metagenomics the biodiversity of hyperthermophilic communities for novel enzymes for plant biomass biodegradation"
- Closing remarks - **Garabed Antranikian,** chairman of the congress

GENERAL INFORMATION

Hotels

Participants staying at **Hotel Panorama** (Harburger Ring 8) can walk to the Hamburg University of Technology (Eißendorfer Straße – Am Irrgarten – Denickestraße). This will take approximately 10–15 min.

Participants staying at **Hotel Lindtner/Hotel Heimfeld** (located 2 km from the congress venue) can reach the Hamburg University of Technology by taxi or bus (line 142). Most of the other hotels are located in downtown Hamburg near the central station (Hauptbahnhof).

Venue

The congress takes place in the southern part of Hamburg (Hamburg-Harburg) at the Hamburg University of Technology.

Hamburg University of Technology (TUHH)
Technische Universität Hamburg-Harburg
Building A
Schwarzenbergstr. 93, 21079 Hamburg
Germany

The Hamburg University of Technology is located 40 km from the airport and 20 km from the city center of Hamburg.

Public transportation from Hamburg Airport: By subway

The S-Bahn (subway) line S1 operates every 10 minutes between Hamburg Airport and central station, Hauptbahnhof, a journey of only 25 minutes. The "Hamburg Airport (Flughafen)" S-Bahn station is directly in front of the terminals and is easily reached by lift, escalator or stairs. Please change at Hauptbahnhof (Central Station) from S1 to S3 (direction: Neugraben, Buxtehude or Stade) or S31 (direction: Harburg Rathaus or Neugraben).

Journey time (stop – stop) takes 45 minutes.

WLAN ACCESS

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Tickets	Button at the ticket machine	Price
Single ticket (one way)	3 (orange)	3,00 Euro
Whole day ticket*	HVV-All-Day-tickets +3	7,30 Euro
9 am day ticket (valid from 9 am)*	T (yellow)	5,60 Euro
9 am group ticket (up to 5 Prsons)*	HVV-Collective tickets +3	10,80 Euro
3-day ticket**	Hamburg CARD	22,90 Euro

* this ticket can be used for unlimited trips within one day

** Hamburg CARD

With this leisure-time pass you are entitled to unlimited travel by bus and train throughout the HVV service area. In addition, you enjoy discounts at or on over 130 tourist- or other interesting offers.

For more information please visit <http://www.hvv.de/en/index.php>

Hamburg Hauptbahnhof → Harburg Rathaus

To get to Harburg please take S3 (direction: Neugraben, Buxtehude or Stade) or S31 (direction: Harburg Rathaus or Neugraben). The train departs every 5 min from the central station. To "Harburg Rathaus" it takes about 16 min.

If you are travelling in a group we recommend the group-card (valid for up to 5 people) for one day.

Local Restaurants

Silo 16

Pizza

Schellerdamm 16, 21079 Hamburg
Phone 040 41541494

momento di

Italian style

Veritaskai 3, 21079 Hamburg
Phone 040 76755594

Lämmertwiete

Different restaurants in the traditional food-mile
with german, italian and brazilian cuisine

Lämmertwiete, 21079 Hamburg

Hotel Lindtner

Exclusive international restaurant

Heimfelderstr. 123, 21075 Hamburg
Phone 040 79090

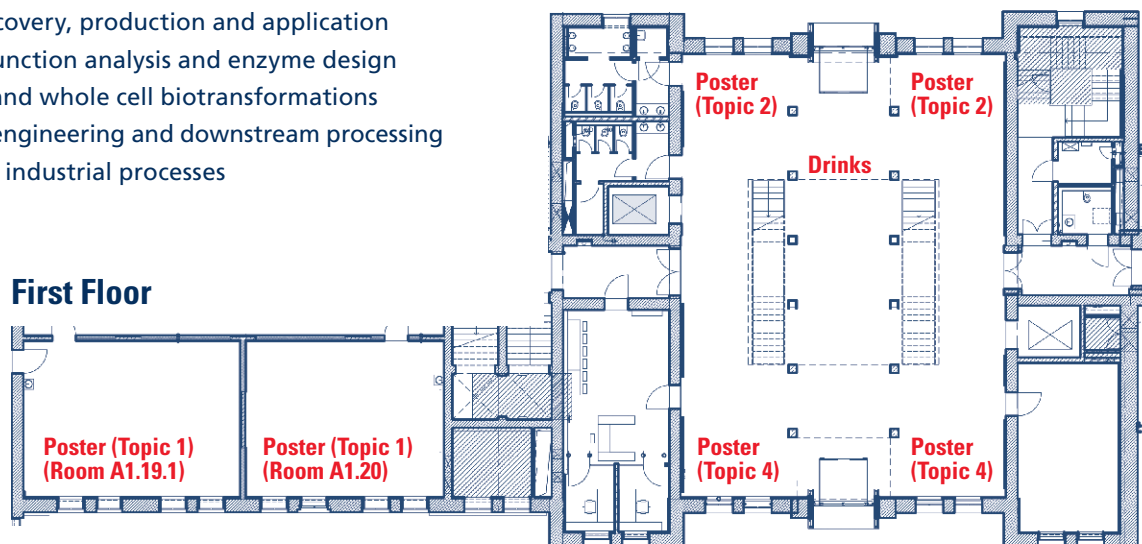
Block House

Steaks and salads

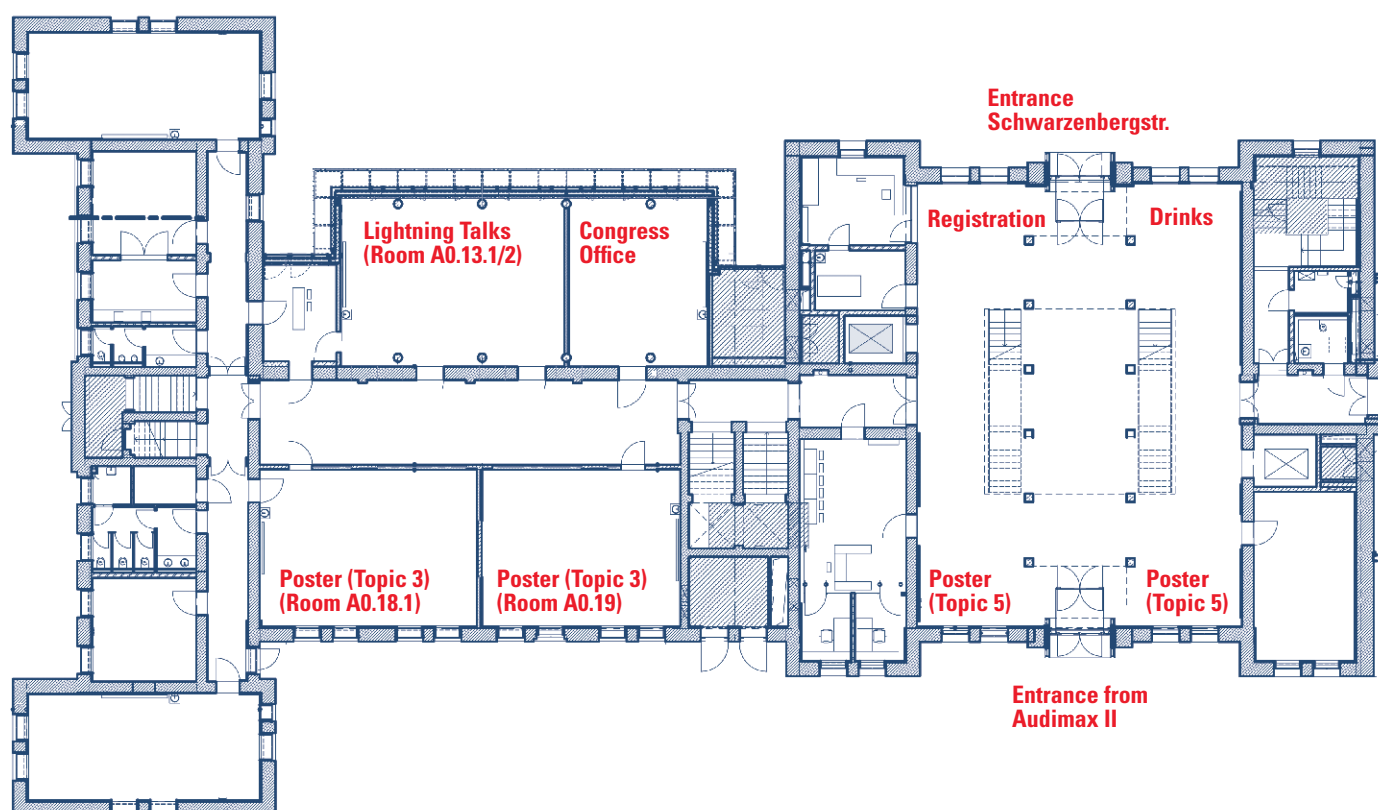
Sand 8, 21073 Hamburg
Phone 040 772437

WHERE TO FIND POSTERS AND LIGHTNING TALKS IN BUILDING A

- Topic 1: Enzyme discovery, production and application
- Topic 2: Structure-function analysis and enzyme design
- Topic 3: Enzymatic and whole cell biotransformations
- Topic 4: Bioprocess engineering and downstream processing
- Topic 5: Sustainable industrial processes



Ground Floor



EXHIBITORS

Bio-Product BV

www.bio-product.nl

Eppendorf AG

www.eppendorf.com

Forschungszentrum Jülich GmbH

www.bmbf.de/de/biooekonomie.php

Nordic ChemQuest AB

www.spinchem.com

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www.biocat2014.de

to S-Bahn Station Heimfeld

BUS-STOP

Bus No. 142

to Hotel Lindtner and Hotel Heimfeld

to Hotel Panorama

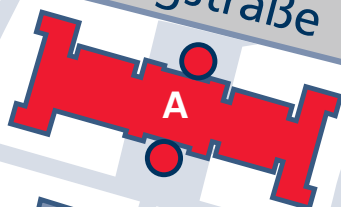
to S-Bahn Station Harburg Rathaus

Schwarzenbergstraße

Haakestraße

Niemannstraße

P



A

REGISTRATION
CONGRESS OFFICE
POSTER PRESENTATION
LIGHTNING TALKS

D

C

E

F

G

P

H

Kasernenstraße

AUDIMAX II
CAFETERIA/MENSA

LECTURE HALL 2

P

Denickestraße



J



P

K

P

Gazertstraße



L

P

O

N

M

P

Eißendorfer Straße

Am Irngarten

BUS-STOP

Bus No. 14, 143, 443

to Hotel Panorama

to S-Bahn Station

Harburg Rathaus

Entrance