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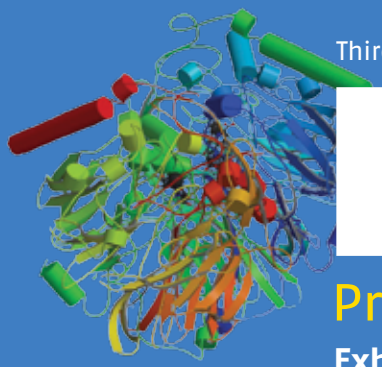

Third Annual

PEGS EUROPE

11-13 October 2011

Protein & Antibody Engineering Summit

Exhibition Grounds Hannover | Germany

11-12 October

- **Engineering of Novel Antibody Constructs and Alternative Scaffolds**
- **Enhancing Expression and Achieving Higher Throughput through Cell Line Development**

12-13 October

- **Therapeutic Developments with Novel Antibody Products**
- **Solving Difficult Protein Problems from Expression through Purification**

Keynote Presentations

Tri-Specific IgG/Fn3-Based Antibodies that Strongly Downregulate and Inhibit EGFR
K. Dane Wittrup, Ph.D., Dubbs Professor & Associate Director, Koch Institute, Biological Engineering and Chemical Engineering, MIT

From Bench to Clinic: Experiences with Cytokine-Antibody Fusion Proteins
Dario Neri, Ph.D., Professor, Chemistry and Applied Biosciences, ETH Zurich

Protein Engineering: Benefiting Therapeutic Proteins and Small Molecule Drugs Alike
Andreas Plueckthun, Ph.D., Professor, Biochemical Institute, University of Zurich

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HOTEL & TRAVEL INFORMATION

Conference Venue

Hannover Exhibition Grounds
Deutsche Messe
Messegelände
30521 Hannover
GERMANY

Hotel Accommodations

PEGS Europe has partnered with BIOTECHNICA, who has teamed up with numerous hotels so you can choose where you would like to stay within your budgeted price range for our upcoming conference.

Book your hotel accommodations on-line

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Whether you are ready to present an exciting new technology, preparing for a new product launch, or need feedback on a specific idea, PEGS Europe offers the perfect platform for you to present to a high-level, targeted audience. Sponsors and exhibitors will also have the opportunity to participate in various networking events, which are an excellent opportunity to network with your customers and prospects.

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There are a limited number of opportunities for sponsors to present on the main conference program for 15 or 30 minutes. The packages include a talk, branding, use of the pre and post-show attendee lists, literature distribution and multiple full conference passes. This sponsorship package also includes a turn-key exhibit package outside of the conference session rooms, where you will have direct access to your target audience during breaks.

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Package includes:

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An executive from your company will chair a session (a group of talks) on the main conference program. This opportunity is exclusive and includes a brief introduction to the session and the individual speakers.

Exhibitor Information

Exhibitors at PEGS Europe will enjoy facilitated networking opportunities with more than 300 high-level decision-makers. Speak face-to-face with prospective clients and showcase your latest product, service or solution. The Biotechnica exhibit hall will host 13,000 attendees over the course of the event. Co-location with Biotechnica will allow you to exhibit as part of the larger event while also meeting with the delegates attending PEGS Europe.

For more information on sponsorship and exhibit opportunities, please contact

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Your conference registration includes access to the BIOTECHNICA Exhibition hall!

PEGS Europe Pre-Conference Short Courses*

MONDAY, 10 OCTOBER

10:00-13:00

(SC1) APPLICATION OF PHAGE DISPLAY IN RESEARCH: Library Generation, Selection, Affinity Maturation and Downstream Uses

- Protein Expression and Purification to Provide Reagents for Antibody Generation, and Downstream Consequences of Quality
- Application of Phage Display to High-Throughput Antibody Generation and Characterization
- Transforming Phage Display into a Convenient Tool for Everyday Research Work
- Recombinant Antibodies to Support Pharmaceutical Research

Instructors:

Michael R. Dyson, Ph.D., Biochemistry, University of Cambridge

John McCafferty, Ph.D., Research Director, Biochemistry, University of Cambridge

Stefan Dübel, Ph.D., Professor & Director, Institute of Biochemistry and Biotechnology, Technische Universität Braunschweig

David Lowe, Ph.D., Principal Scientist, Lead Generation, Department of Antibody Discovery and Protein Engineering, MedImmune Ltd.

14:00-17:00

(SC2) SERUM HALF-LIFE EXTENSION

An issue of many biologicals and antibody constructs is the short serum half-life requiring frequent dosing and other administrations of low convenience. This workshop will cover measures available to increase protein half-life (e.g., serum albumin-binding, Fc fusion, PEGylation) and slow release formulation.

- Technologies for half-life extension
- Comparing and contrasting advantages of each
- Validating technologies

Instructors:

Arne Skerra, Ph.D., CEO, XL-protein GmbH

Tommi Markkula, Ph.D., Head of Research, OctoPlus NV

Antony Godwin, Ph.D., Director, Chemistry, PolyTherics Ltd.

**Separate Registration Required*

2011 PEGS EUROPE MEDIA PARTNERS:

SUPPORTING ORGANIZATION:

Engineering of Novel Antibody Constructs & Alternative Scaffolds

TUESDAY, 11 OCTOBER

9:00 Conference Registration and Morning Coffee

BI-SPECIFIC ANTIBODY ENGINEERING

9:30 Chairperson's Opening Remarks

9:35 T Cell-Engaging Bi-Specific Antibody Constructs for Cancer Therapy

Patrick A. Baeuerle, Ph.D., CSO & Senior Vice President, Research & Development, Micromet, Inc.

Engagement of T cells for cancer therapy requires special antibody constructs. One example is the CD3/CD19-bi-specific BiTE antibody blinatumomab. First clinical results from studies in ALL and NHL patients showed very high response rates and durable remissions after monotherapy with the BiTE antibody blinatumomab. Several other BiTE antibodies are in clinical and pre-clinical development for treatment of solid tumors.

10:05 Kλ-body: A Next Generation Fully Human Bi-Specific Antibody Format with Favorable Biochemical and Manufacturability Properties

Nicolas Fischer, Ph.D. Head, Research, NovImmune SA

Bi-specific antibody formats often include linkers or mutations that can lead to poor biochemical properties and manufacturing issues. The Kλ-body represents a unique bi-specific format, undistinguishable from a standard IgG. The controlled co-expression of a kappa and a lambda light chain with a common heavy chain, combined with a multi step affinity purification process allows for efficient manufacturing.

10:35 Coffee Break - Networking with Sponsors

ADVANCES FROM ACADEMIA

» KEYNOTE PRESENTATION

11:15 Tri-Specific IgG/Fn3-Based Antibodies that Strongly Downregulate and Inhibit EGFR

K. Dane Wittrup, Ph.D., Dubbs Professor & Associate Director, Koch Institute, Biological Engineering and Chemical Engineering, MIT

We describe tri-epitopic antibodies against a single receptor that produce unusually effective receptor downregulation and antagonism. Anti-EGFR Fn3 binding domains were expressed as fusions to cetuximab IgG to create a novel tri-epitopic anti-EGFR antibody that arrests tumor growth in a mouse xenograft model of cetuximab-resistant tumors possessing kinase mutations shown to clinically correlate with cetuximab resistance. The triepitopic constructs overcome cetuximab resistance through improved ADCC and improved inhibition of signaling.

11:45 New Protein Engineering Approaches with Repeat Proteins

Lutz Kummer, Biochemistry, University of Zürich

Specific binding proteins which constitute versatile modules and are robust and can open the door to new applications. Specific, self-indicating sensors and devices that can detect a target at the single molecule level will be presented. An additional challenge is to extend such studies to the whole proteome. Novel engineering based on the repeat protein technology developed in our lab (DARPins, Armadillo repeat proteins) may help to address these challenges.

12:15 Engineering Super Albumin for Improving Serum Half-life

Chaity Chaudhury, Ph.D., Scientist, Antibody Discovery & Protein Engineering, MedImmune LLC

12:45 Lunch for Purchase in Exhibit Hall 9

13:45 Dedicated Poster Viewing in Exhibit Hall 9

ANTIBODY DRUG CONJUGATES

14:30 Chairperson's Remarks

14:35 Novel Linker and Drug Chemistries Yielding Highly Stable and Highly Efficacious Antibody Drug Conjugates

Vincent F.M.H. de Groot, Ph.D., CLP, CEO, Syntarga BV

Antibody-drug conjugate technology based on chemically unique releasable linkers and novel DNA alkylating duocarmycins has been validated in animal models against multiple antigens. Highly potent, proprietary DNA damaging duocarmycin derivatives are linked to antibodies via unique linker chemistry that is maximally complementary with duocarmycin chemistry, resulting in highly stable duocarmycin-based ACDs. Latest results of pre-clinical development progress will be presented along with molecular structural details of this technology.

15:05 Protein Medicinal Chemistry™ Applied to Antibody Drug Conjugates

Ho Sung Cho, Ph.D., CTO, Ambrx

Ambrx is using its proprietary Protein Medicinal Chemistry™ platform to optimize the therapeutic potential of Antibody Drug Conjugates. By creating homogeneous, novel ADCs with defined drug antibody ratios (DAR), and sites of conjugation rationally selected to preserve antibody structure and function, we are able to perform quantitative experiments to identify the best mAb, DAR, linker design, MOA and site(s) of conjugation for several cancer targets.

15:35 Refreshment Break - Networking with Sponsors

MEASURES TO EXTEND HALF-LIFE

16:15 An Engineered MCP-1-based Decoy with Strong Activity in Inflammatory Disease

Sponsored by

Andreas J. Kungl, CSO, ProtAffin Biotechnologie AG

We have used our CellJammer® technology platform to develop a potent anti-inflammatory biopharmaceutical based on the chemokine MCP-1 which showed strong activity in murine models of myocardial infarction and restenosis as well as in the EAE model for MS.

16:30 Sponsored Presentation (Opportunity Available)

16:45 Fab-Fv: an Antibody Fragment Format with Extended Serum Half-life

Sam Heywood, Ph.D., Senior Principal Scientist, Antibody Biology, UCB New Medicines

17:15 New Ways to Extend the in vivo Half-Life of Antibodies

John Desjarlais, Ph.D., Vice President, Research, Xencor, Inc.

We have previously developed Xtend® technologies for optimizing the in vivo half-life of therapeutic antibodies via Fc domain engineering to improve FcRn affinity. Antibodies targeting several classes of antigens show longer in vivo half-life in mouse and cynomolgus monkey studies. More recently we have developed novel constant domain modifications that mediate improved half-life in an FcRn-independent manner. The two technologies are complementary and combine additively to promote long in vivo half-life.

17:45 Modulating the Pharmacokinetic Properties of Bi-Specific DART Molecules Designed for Targeting Human B Lymphocytes

Paul Moore, Ph.D., Vice President, Cell Biology and Immunology, MacroGenics, Inc.

Dual-Affinity Re-Targeting (DART) molecules have been generated that efficiently target human B-lymphocytes either through co-ligation of activating and inhibitory receptors or via co-targeting with cytolytic immune cells. Approaches to modify the pharmacokinetic properties of these bi-specific antibodies either through pegylation, incorporation of albumin binding domains or by fusion to Fc regions will be discussed together with data evaluating their biological properties as potential next generation therapies for autoimmunity.

18:15 Interactive Breakout Discussion Groups

Table 1: Antibodies versus Alternative Scaffolds: Pros and Cons

Table 2: Building Manufacturability into Novel Antibody Formats

Table 3: Advancing Personalized Medicine with Antibody Drug Conjugates

Table 4: Decision Points when Moving from Pre-clinical to Clinical and Beyond

Table 5: Measures to Increase Half-life of the Product

Table 6: Issues to do with Formulation and Delivery

19:15 BIOTECHNICA EVENT NIGHT - Keynote Presentations followed by Networking Reception, Live Music and Dancing

WEDNESDAY, 12 OCTOBER

ENHANCED EFFECTOR FUNCTION

9:30 Chairperson's Opening Remarks

Mona H. Pedersen, Ph.D., Center for Microbial Biotechnology, Technical University of Denmark, DTU Systems Biology

9:35 Creation of Chemically Constrained Peptides with High Potency and Selectivity Using Bicycle Selection Technology

John Tite, Ph.D., CEO, Bicycle Therapeutics Ltd.

Bicycle technology applies principles of Darwinian selection to identify and optimise chemically constrained peptides which have high target binding affinities combined with antibody like specificity. The technology allows the interrogation of chemical space which is not easily accessible by either small molecular weight drugs or antibodies. Molecules are generated which have many of the favorable characteristics of antibodies combined with the manufacturing simplicity and biophysical advantages of small molecules.

10:05 Engineered Fc Domains for Extended Pharmacokinetics and Modulation of Effector Function

David Lowe, Ph.D., Principal Scientist, Antibody Discovery & Protein Engineering, MedImmune Ltd.

Engineering the Fc portions of immunoglobulin molecules has led to many examples of modification of their properties, such as the degree of cell killing by ADCC or CDC and the persistence in serum, which may find future utility in the development of next-generation therapeutics. This presentation will provide case studies of examples of engineered Fc domains that have resulted in clinical and preclinical demonstrations of modulated ADCC and pharmacokinetics.

10:35 Coffee Break - Networking with Sponsors

EXPRESSION AND SELECTION

11:00 Screening and Selection of Therapeutic Antibody Candidates from Human Antibody Libraries

Arnout F. Gerritsen, Ph.D., Associate Director, Assay & Bio Analytical Science, Genmab B.V.

Monoclonal antibodies are a rapidly growing market of therapeutic agents. At Genmab we are focusing at the development of human antibody therapeutics for the treatment of cancer. We are using fully automated hybridoma generation and screening platforms to generate antibody panels with highly characterized and diverse biophysical and functional characteristics to provide tailored drug candidates. Our discovery process is built to deliver highly diverse antibody panels. Here we will provide an overview of the versatile utilization of Bio Layer Interferometry (BLI) in our antibody discovery process to obtain data on affinity, cross-competition and interaction mapping. Based on a case study we will discuss the results of our screening strategy using BLI in our antibody discovery process.

11:30 Expression for Improved Biophysical Properties and Antibody Selection

Jonas V. Schaefer, Biochemistry, University of Zurich

We identified residues in the IgG-frameworks responsible for poor biophysical properties. Mutations not only affected production yield and thermodynamic stability, but also led to more homogeneous batches. Furthermore, expression systems were found to influence the characteristics of antibodies. This is partly caused by different glycan-structures but, more importantly, also by residues left behind from signal-sequences. Systematic investigations of precursors allowed unveiling of deeper folding problems and engineering of aggregation susceptibilities.

12:00 Selection Strategies for the Identification of Antibodies to Under-Represented Epitopic Bins

Jonathan Belk, Ph.D., Senior Scientist, Antibody Engineering, Adimab, LLC

Antibody discovery technologies encounter challenges on the road to therapeutic development such as epitopic "hotspots", limited access recombinant protein or protein that does not accurately represent the native cell expressed form of the therapeutic target. We will discuss how Adimab overcomes these challenges through the rapid integration of full-length IgGs from its naïve discovery process to refocus selections to obtain broad eptopic coverage, or employ various cell selection strategies.

12:30 Lunch for Purchase in Exhibit Hall 9

13:00 Dedicated Poster Viewing in Exhibit Hall 9

13:30 Close of Conference

Therapeutic Developments with Novel Antibody Products

WEDNESDAY, 12 OCTOBER

13:00 Conference Registration

NOVEL FRAGMENTS AND PEPTIDES

14:00 Chairperson's Remarks

Darren J. Hart, Ph.D., Grenoble Outstation, European Molecular Biology Laboratory

KEYNOTE PRESENTATION

» 14:05 From Bench to Clinic: Experiences with Cytokine-Antibody Fusion Proteins

Dario Neri, Ph.D., Professor, Chemistry and Applied Biosciences, ETH Zurich

Antibodies can be used to deliver cytokines to sites of disease (e.g., to the tumor environment), thus enabling therapeutic interventions which spare normal tissues. The antibody-based targeting of tumor neo-vasculature is particularly attractive, because of the dependence of cancer on new blood vessels and because of the accessibility of these structures from the blood-stream. Pre-clinical and clinical results obtained with vascular targeting immunocytokines will be presented in this lecture.

14:35 Development of a Novel anti-CD37 Single-Chain Mono-Specific Polypeptide Drug for the Treatment of B-Cell Malignancies

Paul Algate, Ph.D., Director, Non-Clinical Research, Emergent Biosolutions

TRU-016 is a novel humanized anti-CD37 small modular immunopharmaceutical (SMIPTM) molecule that mediates direct and indirect killing of normal and malignant B-cells. Pre-clinical data will be presented demonstrating mechanisms of action and combinatorial activity with other therapeutics. The status of clinical studies investigating the therapeutic potential of TRU-016 against B-cell malignancies will be discussed.

15:05 Pre-Clinical Development of Fc-Domain Optimized Monoclonal Antibodies with Increased Anti-Tumor Activity

Ezio Bonvini, M.D., Senior Vice President, Research, Macrogenics, Inc.

There is strong rationale for engineering the Fc domain of monoclonal antibodies to enhance Fc-dependent effector functions. Pre-clinical validation of Fc-optimized antibodies, however, presents challenges in efficacy evaluation, safety assessment and pharmacology. This case study will address potential solutions from our experience in the development of two Fc-optimized monoclonal antibodies for cancer treatment, including engineering, *in vitro* characterization, in vivo tumor modelling and pre-clinical toxicology in non-human primates.

15:35 Refreshment Break - Networking with Sponsors

ANTIBODY DRUG CONJUGATES

16:15 Targeting of Viral Particles and Selection Technologies

Kristian Müller, Ph.D., Principal Investigator, Biochemistry & Biology, Syntbio, University of Potsdam

16:45 Calicheamicin Antibody-Drug Conjugates and Beyond

Puja Sapra, Ph.D., Director, Bioconjugates, Oncology Research, Pfizer, Inc.

CMC-544 (inotuzumab ozogamicin), an anti-CD22-calicheamicin conjugate, is currently being evaluated in B-cell non-Hodgkin's lymphoma (B-NHL) patients. This presentation will provide the mechanism of action of calicheamicin immunoconjugates with focus on pre-clinical and clinical data on CMC-544. Further, pre-clinical data for a novel antibody-drug conjugate (ADC) targeting cancer stem cells will be discussed. Challenges in ADC development and potential strategies to overcome these challenges will be reviewed.

17:15 Advances in Linker and Payload Technology

Ravi Chari, Ph.D., Executive Director, Chemistry & Biochemistry, Immunogen, Inc.

Multiple antibody-drug conjugates (ADCs) made with ImmunoGen's maytansinoid cell killing agents are undergoing clinical evaluation. ImmunoGen has developed approaches to tailor each maytansinoid conjugate to achieve the best performance for the specific cancer target. Incorporation of new polar linkers has resulted in antibody-maytansinoid conjugates with enhanced potency towards multidrug resistant tumors in pre-clinical models. The presentation will highlight advances in linker design and new effector molecules for ADCs.

PLENARY KEYNOTE SESSION

18:00 KEYNOTE INTRODUCTION

18:05 Protein Engineering: Benefiting Therapeutic Proteins and Small Molecule Drugs Alike

Andreas Plueckthun, Ph.D., Professor, Biochemical Institute, University of Zurich

18:40 pm 'Systems Patientomics': The Future of Medicine

Hans Lehrach, Ph.D., Director & Head, Vertebrate Genomics, Max Planck Institute for Molecular Genetics

Ten years after the completion of the human genome in a ten year international collaboration at a cost of between 1 and 3 billion Dollar, we are now getting ready to be able to sequence genomes/ transcriptomes as part of routine medical practice in oncology. The flagship project IT Future of Medicine would extend this approach to generate integrated anatomical/molecular models of every patient in the healthcare system, as the basis for a data rich, computation intensive, individualized medicine of the future.

19:15 – 21:00 CHI Networking Dinner Reception

THURSDAY, 13 OCTOBER

FOCUS ON TARGETING AND EFFICACY

9:30 Chairperson's Opening Remarks

Anton Steen, Ph.D., Biochemistry, Groningen Biomolecular Sciences and Biotechnology Institute, Netherlands Proteomics Centre, University of Groningen

9:35 Application of Dual Variable Domain – Ig (DVD – Igtm) Platform Technology to Improve Efficacy of Clinically Validated Mabs

Tariq Ghayur, Ph.D., Senior Research Fellow, Abbott Bioresearch Center

The DVD – IgTM format combines the target binding domains of 2 mAbs via flexible linkers to generate tetravalent, dual – specific molecules with drug-like properties. With this format we can attach additional specificities on to clinically validated mAbs to generate a panel of molecules with distinguishing features. We will discuss how we can apply this platform to rapidly generate a panel of molecules with distinguishing features for pre-clinical studies.

10:05 SGN35: From Bench to Clinic

Petter Veiby, Ph.D., Director, Molecular & Cellular Oncology, Millennium Pharmaceuticals, Inc.

This presentation examines the features of a good target for ADC development. The strong antitumor activity of SGN35 in pre-clinical models of HL and ALCL along with the strong single agent antitumor activity seen in patients with these diseases will be discussed.

10:35 Coffee Break - Networking with Sponsors

DEVELOPMENT OF MULTI-SPECIFIC PRODUCTS

11:00 Targeting Protein-Protein Interactions with Photo-Switchable Peptides

Katja Arndt, Ph.D., Professor, Molecular Biotechnology, Institute for

Biochemistry and Biology, University of Potsdam

11:30 The DARPin Multi-Functional Therapeutic Platform: Pre-Clinical Evaluation and Update on Clinical Progress

Daniel Steiner, Associate Director, Lead Identification, Molecular Partners AG

The success of traditional antibody and biologics applications gives us an idea of the multitude of novel therapeutics that could be generated by combining multiple functionalities. DARPins are the ideal therapeutic platform to rapidly exploit such novel multi-functional concepts resulting in the generation of promising novel therapeutic candidates. We will present several examples of novel functionality combinations along with the latest clinical and pre-clinical data on DARPins.

12:00 Ang-2-VEGF CrossMab, a Novel Bi-Specific Human IgG1 Antibody Blocking VEGF-A and Ang-2 Function Mediates Potent Anti-Tumoral, Anti-Metastatic and Anti-Angiogenic Efficacy

Markus Thomas, Ph.D., Research Scientist, Pharma Research & Early Development, Discovery Oncology, Roche Diagnostics GmbH

VEGF-A blockade has been validated clinically as a treatment for human cancers. Angiopoietin-2 (Ang-2) expression has been shown to function as a key regulator of tumor angiogenesis. We have generated a bi-specific human IgG1 antibody (Crossmab) blocking VEGF-A and Ang-2 function simultaneously. Our data indicate that the CrossMab mediates potent anti-tumoral, anti-metastatic and anti-angiogenic efficacy and represents a promising therapeutic agent for the therapy of cancer.

12:30 Lunch for Purchase and Poster Viewing in Exhibit Hall 9

DEVELOPABILITY/ GLYCO-OPTIMIZATION

14:30 Chairperson's Remarks

14:35 Anticalins: A Novel Therapeutic Protein Platform with Drug-like Properties

Thomas Sandal, Vice President, Bioprocess & CMC, Pieris AG

The Anticalin technology is a clinical stage therapeutic protein platform with drug-like pharmacological and pharmaceutical properties that can be manufactured in a straight forward manner. This presentation will provide a description of Pieris approach to integrating developability criteria into its drug discovery processes. Case studies will be presented highlighting the robust pharmaceutical characteristics of Anticalins drug candidates.

15:05 Glyco-Optimized Antibodies for Cancer Treatment

Steffen Goletz, Ph.D., CEO & CSO, Glycotope GmbH

Three glyco-optimized antibodies produced by the GlycoExpress technology are presently in clinical development. These are glycol-optimized with respect to manifold improvement of anti-cancer activity, half-life elongation, removal of immunogenic components and broadening of the patient and indication coverage. Two of these biobetter antibody molecules are directed against approved targets. We will present the glycosylation technologies and potentials as well as pre-clinical and clinical features of the glycol-optimized antibodies.

15:35 Sponsored Presentation (Opportunity Available)

16:05 Refreshment Break - Networking with Sponsors

ADVANCED DELIVERY AND TARGETING

16:30 Pulmonary Domain Antibody (Dab) Platform and Development of an Inhaled Dab Targeting TNFR1 for the Treatment of Pulmonary Diseases

Ruud de Wildt, Ph.D., Head, Pulmonary Group, Topical Delivery BDU, Biopharm Research & Development, GlaxoSmithKline

This talk will provide an update on the pre-clinical and clinical data of domain antibody-based drugs that are currently in development. It will cover the advantages over conventional monoclonal antibody-based therapies with a particular focus on topical delivery and also the pre-clinical proof-of-concept for pulmonary delivered domain antibodies and the clinical utility of domain antibodies for treatment of pulmonary disease.

17:00 Developing Antibody Targeted Superparamagnetic Iron Oxide Nanoparticles for Cancer Treatment

Kerry Chester, Ph.D., Professor, Cancer Institute, University College London

Superparamagnetic Iron Oxide Nanoparticles (SPIONs) have exciting potential for cancer therapy because they can be induced to heat upon application of an alternating magnetic field. SPION can also be detected by magnetic resonance imaging (MRI). Tumour targeted antibody-SPION conjugates therefore have potential to provide selective tumour imaging followed by potent localized hyperthermic therapy. The feasibility and translational challenges of these new nanomedicines will be illustrated with SPION-functionalized anti-cancer antibody fragments.

17:30 Close of Conference

Fifth Annual

11–12 October

Enhancing Expression and Achieving Higher Throughput through Cell Line Development

TUESDAY, 11 OCTOBER

9:00 Conference Registration and Morning Coffee

TOOLS AND TECHNIQUES FOR ENHANCING EXPRESSION

9:30 Chairperson's Opening Remarks

Trevor Wilkinson, Ph.D., Associate Director, Antibody Discovery and Protein Engineering, MedImmune

9:35 Transient and Stable Mammalian Expression Platforms to Support Antibody Drug Discovery

Trevor Wilkinson, Ph.D., Associate Director, Antibody Discovery and Protein Engineering, MedImmune

We have developed a number of expression platforms using a combination of transient and stable cell line expression systems. These are used to produce protein antigens to facilitate the discovery of potential antibody therapeutics. The presentation will describe these systems and provide some case studies of their application.

10:05 Optimizing Protein Pipeline for Drug Discovery

Janet Sim, Ph.D., Investigator III, Oncology Protein Science, Novartis

To support drug discovery from target validation, assay development and crystallography the Oncology Protein Science group has implemented a flexible process and built optimized expression tools. This includes a suite of technologies to enable rapid testing of host systems (mammalian, insect and *E. coli*), promoter screens, vector optimization, rapid protein detection tools, chromatography optimization and knowledge-based protein truncation design. I will discuss our platform and use various examples to discuss strategies to overcome challenges for generation of protein and protein complexes.

10:35 Coffee Break - Networking with Sponsors

11:15 Sponsored Presentation (Opportunities Available)

11:45 Artificial Induction of the Unfolded Protein Response: A Tool to Increase Protein Production in *Pichia pastoris*

Mouna Guerfal, M.Sc., Researcher, Unit for Medical Biotechnology, Laboratory for Protein Biochemistry and Biomolecular Engineering, VIB Department for Molecular Biomedical Research, UGent

Artificial induction of the unfolded protein response (UPR) by overexpression of

the transcription factor Hac1p can be used to improve the yield of recombinant proteins. After characterization of the transcription factor, Hac1p overexpression was evaluated on the production of secreted, surface displayed and membrane proteins. We show that the homogeneity and the expression levels of heterologous proteins can be increased by co-expression with Hac1p.

12:15 Sponsored Presentations (Opportunities Available)

12:45 Lunch for Purchase in Exhibit Hall 9

13:45 Dedicated Poster Viewing in Exhibit Hall 9

ENGINEERING FOR BEST RESULTS

14:30 Chairperson's Remarks

Michael R. Dyson, Ph.D., Senior Research Associate, Biochemistry, University of Cambridge

14:35 Transient Production of Recombinant Antibodies and Fusion Proteins in HEK293-6E Cells

Thomas Schirrmann, Ph.D., Research Group Leader and Lecturer, Department of Biotechnology, TU Braunschweig

Optimized antibody phage display can accomplish the demands of upcoming affinity proteome projects. We use the IgG-like scFv-Fc antibody format to address many application issues. To overcome the production bottleneck we improved a transient protein expression system using human embryonic kidney HEK293-6E cells allowing volumetric yields of more than 400 mg/L for a large number of different antibodies.

15:05 Selection of Soluble Protein Expression Constructs: The Experimental Determination of Protein Domain Boundaries

Michael R. Dyson, Ph.D., Senior Research Associate, Department of Biochemistry, University of Cambridge

Where expression of a full-length protein is problematic, it is often useful to clone and express individual protein domains. However, the annotated domain boundaries in databases such as Pfam or SMART are not always accurate. Various rational and combinatorial strategies for the experimental determination of the true protein domain boundaries will be described, including biophysical methods to screen selected clones.

15:35 Refreshment Break - Networking with Sponsors

16:15 Sponsored Presentation (Opportunity Available)

16:45 Stepwise Engineering of a *Pichia pastoris* D-amino Acid Oxidase Whole Cell Catalyst

Anton Glieder, Ph.D., Professor of Biotechnology, Austrian Centre of Industrial Biotechnology, Graz University of Technology

Based on a new open source *Pichia pastoris* expression platform advanced expression technologies were developed employing additive and synergistic advantages from gene design, protein targeting and strain engineering. Examples including soluble and membrane bound intracellular enzymes as well as secreted biocatalysts will be shown as examples where these new tools and technologies have been applied.

17:15 *Pichia pastoris* is Superior to *E. coli* for the Production of Recombinant Allergenic Non-Specific Lipid-Transfer Proteins

Martin Himly, Ph.D., Division of Allergology, Paul-Ehrlich-Institut

The non-specific lipid-transfer protein (nsLTP) of hazelnut represents a clinically important allergen termed Cor a 8. For production of a properly folded and biologically active recombinant Cor a 8 several expression systems were tested and the recombinant molecules characterized in detail. *P. pastoris* seemed superior to *E. coli* to obtain large quantities of soluble, properly folded, and biologically active rCor a 8.

17:45 The Challenge of Making Oxidation-Sensitive Proteins: Recombinant Production of an RNase Inhibitor

Peter Neubauer, Ph.D., Laboratory of Bioprocess Engineering, Department of Biotechnology, Technische Universität Berlin

Here we describe different approaches for production of active RI in Escherichia coli, which include (a) production as a fusion protein [1], production as an authentic RI in the periplasm, as well as production of authentic RI in the E. coli cytoplasm. For all strategies fed-batch processes were developed which result in a high production of the target protein. The actual study shows, how physiological knowledge combined with high throughput screening strategies can be successfully applied for a straight forward bioprocess development also for difficult-to-produce considered proteins.

18:15 Interactive Breakout Discussion Groups

19:15 BIOTECHNICA EVENT NIGHT - Keynote Presentations followed by Networking Reception, Live Music and Dancing

WEDNESDAY, 12 OCTOBER

EXPRESSION WITH AN EYE TOWARDS SCALE-UP

9:30 Chairperson's Opening Remarks

Mona H. Pedersen, Ph.D., Center for Microbial Biotechnology, Technical University of Denmark, DTU Systems Biology

9:35 A Comparative Summary of Expression Systems for the Recombinant Production of Galactose Oxidase

Oliver Spadiut, Ph.D., Univ.Ass. Dipl.-Ing., Intitute of Chemical Engineering, Div. Biochemical Engineering, Vienna University of Technology

A comparative study was performed to evaluate a range of constructs and process parameters for the heterologous intra- and extracellular expression of genes encoding the industrially relevant enzyme galactose 6-oxidase (EC 1.1.3.9) from the fungus *Fusarium graminearum* in the recombinant hosts *Escherichia coli* and *Pichia pastoris*.

10:05 Establishing Production Cell Lines for Structural Biology by Targeted Integration and Cell Sorting

Konrad Büssow, Ph.D., Project Group Leader, Molecular Structural Biology, Helmholtz Zentrum für Infektionsforschung

The tagging of a favourable genetic locus followed by shuttling genes of interest to that locus represents a fast and reproducible approach of cell line development. A combination strategy of preparative FACS and genetic targeting is presented that proved useful for establishing glycosylation mutant cell lines for protein crystallography.

10:35 Coffee Break - Networking with Sponsors

11:00 Sponsored Presentation (Opportunity Available)

11:30 Improved Mycobacterial Protein Production Using a *Mycobacterium smegmatis* GroEL1ΔC Expression Strain

Elke E. Noens, Ph.D., European Molecular Biology Laboratory (EMBL), Hamburg Outstation

Hsp60 chaperone GroEL1, containing a histidine-rich C-terminus is often co-purified with polyhistidine-tagged recombinant proteins when using *Mycobacterium smegmatis* for the expression of Mycobacterium tuberculosis proteins. We created a mutant version of GroEL1, GroEL1DC, which is unable to bind nickel affinity beads. The resulting *Mycobacterium smegmatis* groEL1DC expression strain allows efficient expression and purification of mycobacterial proteins while concomitantly removing GroEL1, increasing the speed and efficiency of protein purification.

12:00 High-Yield Production of Hydrophobins-RodA and RodB from *Aspergillus fumigatus* in *Pichia pastoris*

Mona H. Pedersen, Ph.D., Center for Microbial Biotechnology, Technical University of Denmark, DTU Systems Biology

Hydrophobins are small fungal proteins with distinct amphipatic properties, thus many technical applications have been suggested for them. Here we report the successful expression of two hydrophobins RodA and RodB from the opportunistic pathogen *Aspergillus fumigatus* and present fed-batch fermentation yields of 200-300 mg/l broth. The expression strategy and fed-batch production using Pichia pastoris may be transferred to hydrophobins from other fungal species.

12:30 Lunch for Purchase in Exhibit Hall 9

13:00 Dedicated Poster Viewing in Exhibit Hall 9

13:30 Close of Conference

Solving Difficult Protein Problems from Expression through Purification

WEDNESDAY, 12 OCTOBER

13:00 Conference Registration

EXPRESSION OF COMPLEX PROTEINS

14:00 Chairperson's Remarks

Darren J. Hart, Ph.D., Grenoble Outstation, European Molecular Biology Laboratory

14:05 Engineering Mammalian Cell Lines and Vectors for Improved Secretion of Hard to Express Proteins

Nic Mermod, Ph.D., Director, Institute of Biotechnology, University of Lausanne

Methods to increase transgene integration using a gene transfer process based on homologous recombination will be presented, opening new avenues to engineer cells to achieve more efficient recombinant protein expression. Protein secretion is another bottleneck, especially for difficult to express secreted proteins. We will illustrate how the faulty step can be identified and show that overexpression of specific combinations of secretion pathway proteins may solve processing and secretion issues for difficult to express proteins.

14:35 Random Library Approaches for Expression of Challenging Proteins

Darren J. Hart, Ph.D., Grenoble Outstation, European Molecular Biology Laboratory

ESPRIT is a directed evolution-type method that permits solubility screening of tens of thousands of random constructs of a single target gene. Expression and purification of domains from many challenging, poorly annotated proteins has been achieved for applications in structural biology and immunisation. The core technology plus recent developments for studying protein complexes and increasing throughput will be presented.

15:05 Humanization of the Plant N-glycosylation Pathway for the Production of Therapeutically Relevant Proteins

Herta Steinkellner, Ph.D., Department of Applied Genetics and Cell Biology, University of Natural Resources and Life Sciences

The presentation focuses on the manipulation of the plant N-glycosylation pathway for the production of recombinant proteins with a defined N-glycosylation pattern. We demonstrate knock in and knock out approaches to generate recombinant proteins with a customized N-glycosylation profile, including sialylation, the most complex human type of glycosylation. The impact of N-glycosylation to the function of recombinant proteins will be discussed.

15:35 Refreshment Break - Networking with Sponsors

16:15 Sponsored Presentations (Opportunities Available)

16:45 The MultiBac Platform at EMBL: Enabling Complex Protein Expression in Academic and Industrial R&D

Simon Trowitzsch, Ph.D., Researcher, Genome Biology, EMBL Grenoble

The baculovirus/insect cell expression system is particularly useful for producing such protein targets, biologics and multicomponent assemblies, for many applications. We have developed MultiBac, a BEVS designed for high-quality multiprotein complex production, and have installed MultiBac as a platform technology at the Eukaryotic Expression Facility (EEF) at the EMBL. Our MultiBac system and several of its successful applications, in academic and industrial R&D, will be presented.

17:15 High Yields of Functional Soluble T Cell Receptors after Stability Engineering

Geir Åge Løset, Ph.D., Research Associate, Department of Molecular Biosciences, Centre for Immune Regulation, University of Oslo

The vast repertoire of T cell receptors manifests the host diversity orchestrating adaptive immunity. Their detailed characterization is often challenging, as they express poorly as soluble molecules. We have systematically improved intrinsic molecular stability by homology defined point mutations, domain format variants and phage display engineering resulting in high yields of functional soluble T cell receptors.

» PLENARY KEYNOTE SESSION

18:00 Keynote Introduction

18:05 Protein Engineering: Benefiting Therapeutic Proteins and Small Molecule Drugs Alike

Andreas Plueckthun, Ph.D., Professor, Biochemical Institute, University of Zurich

18:40 pm 'Systems Patientomics': The Future of Medicine

Hans Lehrach, Ph.D., Director & Head, Vertebrate Genomics, Max Planck Institute for Molecular Genetics

Ten years after the completion of the human genome in a ten year international collaboration at a cost of between 1 and 3 billion Dollar, we are now getting ready to be able to sequence genomes/ transcriptomes as part of routine medical practice in oncology. The flagship project IT Future of Medicine would extend this approach to generate integrated anatomical/ molecular models of every patient in the healthcare system, as the basis for a data rich, computation intensive, individualized medicine of the future.

19:15 – 21:00 CHI Networking Dinner Reception

THURSDAY, 13 OCTOBER

MEMBRANE PROTEINS AND GLYCOSYLATION

9:30 Chairperson's Opening Remarks

Anton Steen, Ph.D., Biochemistry, Groningen Biomolecular Sciences and Biotechnology Institute, Netherlands Proteomics Centre, University of Groningen

9:35 *Lactococcus lactis*: An Alternative System for Functional Expression of Peripheral and Intrinsic Arabidopsis Membrane Proteins

Annie Frelet-Barrand, Ph.D., CEA iBiTec-S/SB2SM CNRS URA 2096/LSOD 91191 Gif sur Yvette Cédex

Lactococcus lactis is a Gram-positive lactic bacterium traditionally used in food fermentations. At this time, it starts to be widely used in biotechnology for large-scale overproduction of heterologously expressed proteins. Moreover, it has been revealed in the last years to be a good alternative system to *E. coli* for expression of functional and difficult membrane proteins and more particularly of plant proteins.

10:05 Rapid Establishment of G-Protein-Coupled Receptor-Expressing Cell Lines by Site-Specific Integration

Roland Schucht, Ph.D., Managing Director, InSCREENeX GmbH

The establishment of mammalian cell lines reliably expressing drug targets like G-Protein coupled receptors (GPCRs) can be a time-consuming process. InSCREENeX has developed a DNA recombinase based strategy to allow the rapid production of such cell lines. Specialized and optimized master cell lines serve as a flexible platform to generate screening cell lines expressing the GPCR of interest.

10:35 Coffee Break - Networking with Sponsors

11:00 Sponsored Presentation (Opportunity Available)

11:30 Beyond Bottlenecks in Membrane Protein Production

Anton Steen, Ph.D., Biochemistry, Groningen Biomolecular Sciences and Biotechnology Institute, Netherlands Proteomics Centre, University of Groningen

Membrane proteins represent the direct targets of approximately 60% of all human pharmaceuticals. The structural and functional study of membrane proteins, however, has been hampered in large part due to their problematic overproduction in a functional state. Here we present a series of integrated projects, which aim for the optimization of the Gram-positive bacterium *Lactococcus lactis* as a host for the production of membrane proteins.

12:00 Improving N-glycosylation Efficiency in *Escherichia coli* using Shotgun Proteomics, Metabolic Network Analysis, and Selective Reaction Monitoring

Phillip C. Wright, Ph.D., Chemical and Biological Engineering, ChELSI Inst., Biological and Environmental Systems Group, University of Sheffield

Although functionality of the native Campylobacter jejuni N-glycosylation system in E. coli has been demonstrated, the efficiency of the process was found to be low at 13.4 ± 0.9% of total extracted protein. A combined approach using isobaric labeling of peptides and probability-based network analysis of metabolic changes was applied to forward engineer E. coli to improve glycosylation efficiency of AcrA. While the overall recombinant protein titre did not change significantly, the amount of glycosylated protein increased by approximately 300%.

12:30 Lunch for Purchase in Exhibit Hall 9

13:45 Dedicated Poster Viewing in Exhibit Hall 9

DISULFIDE BONDS AND REFOLDING

14:30 Chairperson's Remarks

14:35 Efficient Production of Disulfide Bonded Proteins in the Cytoplasm of *E. coli*

Lloyd W. Ruddock, Ph.D., Biochemistry, Linnanmaa Campus, University of Oulu

We have developed new methods for the efficient production of disulfide bonded proteins in the cytoplasm of E.coli with yields up to 100mg/L of culture from shake flasks of eukaryotic proteins with multiple disulfide bonds. Furthermore, we show that disruption of the reducing pathways in the cytoplasm is not essential for efficient disulfide bond formation.

15:05 Expression and Purification of Bioactive Soluble Murine Stem Cell Factor from Recombinant *Escherichia coli* Using Thioredoxin as a Fusion Partner

Ursula Rinas, Ph.D., Institute of Technical Chemistry-Life Science, Leibniz University of Hannover

Following dialysis and a final purification step, the target protein was isolated in high purity. Bioactivity of mSCF was proven by different tests (MTT analogous assay, long-term proliferation assay) applying a human megakaryocytic cell line. We observed a significant activity of the uncleaved fusion protein, even though it was less than the activity displayed by the purified mSCF. In summary, avoiding inclusion body formation we present an efficient production procedure for mSCF, one of the most important stem cell

15:35 Sponsored Presentation (Opportunity Available)

16:05 Refreshment Break - Networking with Sponsors

CASE STUDIES IN SUCCESS

16:30 An Effective Secretory Expression System for the Production of Recombinant Human Proteins in *E. coli*

Alexander Kotzsch, Ph.D., Facility for Protein Science and Technology, The Novo Nordisk Foundation

E. coli remains the workhorse for the production of recombinant proteins due to its robustness, cost-effectiveness and easy handling. However, certain proteins cannot be isolated in a biologically relevant form using standard cytoplasmic expression approaches. Therefore, we generated and optimized a secretory *E. coli* expression system, which is compatible with high-throughput methods and which allows the purification of biomedically interesting human proteins from *E. coli* culture supernatants.

17:00 Refolding, Purification and Characterization of Human Laforin and its Carbohydrate Binding Module

Pedro Castanheira, Ph.D., IBB-Institute for Biotechnology and Bioengineering, Center of Biological Engineering, University of Minho; Biocant

Laforin is a human dual specificity phosphatase containing a Carbohydrate Binding Module (CBM) and is involved in glycogen biosynthesis regulation. After several attempts to express its CBM by different strategies, we have successfully expressed and purified it by protein refolding from inclusion bodies. The same strategy was successfully used to produce the full length protein.

17:30 Close of Conference

Pricing and Registration Information

SHORT COURSES (10 OCT)

	Commercial	Academic, Government, Hospital-affiliated	Student
One short course	€625	€375	€125
Two short courses	€895	€625	€195

Application of Phage Display in Research	Serum Half-Life Extension

EVENT PRICING - *BEST VALUE!* (11-13 OCT)

(Includes 2 conferences, excludes short courses)	Commercial	Academic, Government, Hospital-affiliated	Student
Early Registration Deadline until 22 July	€1845	€895	
Advance Registration Deadline until 9 September	€1995	€945	
Registrations after 9 September and on-site	€2145	€995	€495

INDIVIDUAL CONFERENCE PRICING

(Includes 1 conference, excludes short courses)	Commercial	Academic, Government, Hospital-affiliated	Student
Early Registration Deadline until 22 July	€1245	€645	
Advance Registration Deadline until 9 September	€1395	€695	
Registrations after 9 September and on-site	€1545	€755	€345

11 - 12 October	12 - 13 October
Engineering of Novel Antibody Constructs and Alternative Scaffolds	Therapeutic Developments with Novel Antibody Products
Enhancing Expression and Achieving Higher Throughput through Cell Line Development	Solving Difficult Protein Problems from Expression through Purification

COMPLIMENTARY BIOTECHNICA EVENT: Tuesday, 11 October: **BIOTECHNICA Night** - Keynote and Reception.

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Poster Submission-Discount (€45 Off)

Poster abstracts are due by 9 September 2011. Once your registration has been fully processed, we will send an email containing a unique link allowing you to submit your poster abstract. If you do not receive your link within 5 business days, or by 2:00 pm EDT on 12 September, 2011, please email a text-only Word file of your submission to jring@healthtech.com.

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