12TH AIS 2024 Antibody Industrial Symposium

JUNE 20-21, 2024
MONTPELLIER, FRANCE

MAbimprove LabEx Tours Montpellier

mabdesign THE BIOTHERAPY EXPERT

Welcome to the 12th Antibody Industrial Symposium

Dear colleagues,

We are thrilled to announce the 12th edition of the Antibody Industrial Symposium 2024 (AIS2024) that will take place from June 20th to 21st, 2024 in the sunny city of Montpellier, France. This prestigious international congress is jointly organized by the scientific society LabEx MAbImprove and the dynamic industrial organization MabDesign. AIS2024 represents a pinnacle in our series of Antibody Industrial Symposia initiated by MAbImprove in 2013. Our past themes have delved into the forefront of antibody innovation, addressing vital topics such as Antibodies Biosimilars, MAbDosing, and the revolutionary potential of Harnessing the Immune System with Abs, among others. This symposium isn't just another conference; it's a vibrant platform where researchers, industry leaders, medical professionals, and policymakers converge to explore the latest advancements in therapeutic antibodies and beyond.

The Scientific advisory Board committee has set-up an exciting program, featuring captivating keynote lectures, dynamic pitch talks unveiling innovative projects, and insightful industry presentations from leading pharmaceutical entities.

Spanning across 8 captivating tracks, this year's program will explore the hottest trends in antibody research and development, encompassing areas such as:

- Next-Generation of Antibodies & new Modalities
- Antibody-based Cancer Therapies
- Efficacity and Safety from Preclinical to FIH Trials
- AI & Machine Learning for Antibody Discovery
- Optimization and Clinical Development

Moreover, AIS2024, offers invaluable networking opportunities, providing a platform for companies to showcase their pioneering products and technologies, as well as dedicated sessions for fruitful business collaborations.

Nestled in the heart of Montpelier, the CORUM internation conference center provides a warm setting for our symposium, providing easy transport link and plenty of accommodations nearby, ensuring a seamless experience for all attendees.

We eagerly anticipate your presence at the 12th Antibody Industrial Symposium 2024 in Montpellier, where innovation and collaboration flourish!!

Best regards,

The Organizing Committee – LabEx MabImprove and MabDesign
The Scientific Committee

About the Organisers and Committees

LabEx MabImprove

MAbImprove is a « laboratoire d'excellence » (LabEx) dedicated to therapeutic antibodies with the motto « Better antibodies, better developed, better used », gathering 23 research teams from Tours and Montpellier, and more than 200 researchers from Universities, INSERM, CNRS, INRAE and hospitals.

Its scientific project is organized in 4 Key Questions based on the current trends of this domain and at the interface between academic research, industrial development and clinical use:
- How can target activity be modulated through antibody binding?
- How can antibody activity be optimized by adjusting format?
- How can antibody efficacy be increased using combinations?
- How can antibody administration be improved?

MAbImprove is led by Prof. Hervé Watier (Tours, coordinator) and Dr. Pierre Martineau (Montpellier, deputy coordinator).

More information : www.mabimprove.univ-tours.fr I labex_mabimprove@univ-tours.fr

SCIENTIFIC COMMITTEE

Alain Beck | Centre d'Immunologie Pierre Fabre
Thierry Wurch | Evotec
Ana Antunes | MabDesign
Nicolas Poirier | OSE Immunotherapeutics
Mireia Pelegrin | Institute for Regenerative Medicine and Biotherapy
Lennart Zabeau | Orionis Biociences
Mar Naranja Gomez | Institute for Regenerative Medicine and Biotherapy
Stéphanie Cornen | Innate Pharma
Francis Duffieux | SANOFI
Bruno Robert | Institut de Recherche en Cancérologie de Montpellier
Pierre Ferré | Compugen Ltd.
Virginie Lafont | Institut de Recherche en Cancérologie de Montpellier
Marie-Alix Poul | Université de Montpellier
Peter Lowe | Merus
Fabien Rousset | Sartorius

MABDESIGN

MabDesign, the French biotherapy industrial association, aims to support, federate and increase the visibility of the biopharmaceutical industry, foster exchanges, promote the development and competitiveness of companies, and stimulate innovation by encouraging the emergence of start-ups from academic research.

Created in 2014, MabDesign's governance has evolved to meet the specific needs of the various companies working in the biotherapy industrial sector. Its Board of Directors is composed by ABL Europe, Biomérieux, DBV Technologies, Institut Pasteur, Lyonbiopôle, Pierre Fabre, Sanofi, ThermoFisher, TreeFrog Therapeutics and 4 independent field experts.

Moreover, to achieve its goals MabDesign sets up a coherent set of actions promoting exchanges, collaborations and skills development. In this dynamic MabDesign has developed a national directory that brings together industrial and academic players in biotherapy and allows to identify online the know-how available in France. MabDesign organizes high-level international scientific events, in collaboration with key ecosystem players, to highlight innovation and stimulate exchanges between companies in the sector. With the help of its Scientific Committee (COSSF), MabDesign writes summary reports (ImmunoWatch & BioprocessWatch) for the biotherapy industry. MabDesign offers specialized and innovative continuous professional training solutions to enable companies to adapt their skills to the market evolution and maintain their competitiveness. Finally, MabDesign offers its members a wide range of services to help companies of all sizes to optimize their positioning, protect and enhance their innovations, conquer new markets and raise public funds.

Operational since September 2015, MabDesign currently has over 300 member companies and its diversity is its strength. MabDesign's dynamic network includes pharmaceutical and biotech companies, service providers (eg. CROs, CDMOs, etc), professional training actors, high-tech equipment suppliers and specialized consultants.

More information : www.mabdesign.fr I contact@mabdesign.fr I @MabDesign_fr

ORGANISATION COMMITTEE

Nicolas Groux | MabDesign
Ana Antunes | MabDesign

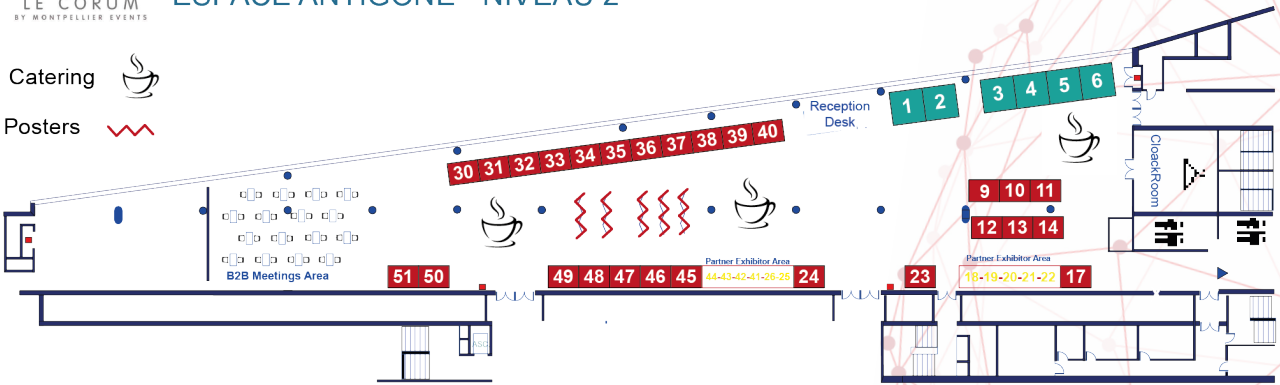
Hervé Watier | LabEx MabImprove

EXHIBITION HALL

ESPACE ANTIGONE - NIVEAU 2

Catering

Posters



LIST OF COMPANIES

1 - SANOFI
2 - PROMEGA
3 - SAMPLIX
4 - Polyplus
5 - MImAbs
6 - Agro-Bio
9 - RD-Biotech
10 - Molecular Devices
11 - Fox Biosystems
12 - Evidentic
13 - Manpower Life Sciences
14 - Mabqi
17 - Quality Assistance
18 - Hybrigenics Services
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37 - GENOVIS
38 - MedChemExpress
39 - AcroBiosystems
40 - Proteogenix
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42 - Dynamic Biosensors
43 - Rapid Novor
44 - Kymos
45 - MabSilico
46 - Sourcin
47 - Proteintech
48 - Geneious by Dotmatics
49 - BIOTEM
50 - Delta Life Science
51 - Integrated DNA Technologies

Program - **DAY 1 |** Thursday, June 20th 2024

8h00 Registration and welcome coffee

8h45 Welcome Address | Einstein Auditorium

9h00 Opening Keynote Lectures | Einstein Auditorium

9h00 - Next generation bispecific antibodies and antibody fusion proteins for cancer immunotherapy

Christian Klein | Distinguished Scientist, is Department Head Cancer Immunotherapy Discovery 3, Head Oncology Programs & Site Head Roche Innovation Center Zurich | Roche pRED, Switzerland

9h30 - Clinical development of bispecific antibodies and ADCs: toxicity mitigation and activity optimization strategies in expanded phase I trials

Elisa Fontana | MD, PhD, Hospital Medical Director | The Sarah Cannon Research Institute in London, UK

10h00 Coffee Break - B2B Meetings | Exhibition Hall

10h30 Paving the way for the next-generation of Antibodies & New Modalities | **Session I** | Einstein Auditorium

10h30 - KnotBodies: creating Ion Channel Modulating Antibodies by fusing Knottins in Antibody loops

Pedro Villar | Senior Scientist | Maxion Therapeutics, UK

11h00 - From Sugars to Solutions: Advancing Cancer Therapeutics with Glycobiology

Paula Videira | Co-founder and CTO | CellmAbs | Associate Professor and Group Leader | UCIBIO, NOVA School of Science and Technology, NOVA University Lisbon, Portugal

11h30 - Optimizing Discovery Strategies for TCR Bispecifics

Peter Molloy | Senior Fellow, Protein Engineering | Immunocore Ltd, UK

Antibody-based Cancer Therapies : latest developments | Barthez Auditorium

10h30 - Bispecific Antibody Drug Conjugates (BsADCs): strategies and challenges

Alain Beck | Senior Director, Biologics CMC & developability | Pierre Fabre, France

11h00 - Innovative cancer therapies based on first-in-class antibodies anti-GPCR drug conjugates

Aiphi Andrée Nguyen | CEO | Skymab Biotherapeutics, France

11h30 - Merus Class of Bispecific ADC (ADClonicsTM) to Achieve Improved Binding Selectivity, Internalization and Tumor Cell Killing

Peter Lowe | Director Antibody Engineering |

12h00 - Leveraging cutting-edge DNA technologies to build precision libraries for antibody engineering

Radha Parmar | Science & Technology Consultant, Biologics - EMA | Twist Bioscience, USA

Merus, Netherlands

12h00 - Comprehensive and Reliable Characterization of Antibody Therapeutics thanks to Kimialys's innovative SPR biochips

Claude Nogues | CSO & Co-founder | Kimialys, France

12h10

Lunch break - B2B Meetings | Exhibition Hall

13h00

Workshop : How to analyze NGS antibody sequence data in PipeBio | Barthez Auditorium

Simit Patel | Senior Field Applications Scientist | PipeBio, Denmark

14h00

Paving the way for the next-generation of Antibodies & New Modalities | **Session II** | Einstein Auditorium

14h00 - Exploiting the advances of soloMER biologics to deliver multi-functional products for autoimmune diseases and cancer

Caroline Barelle | CEO & founder | Elasmogen, UK

Discovery and Development on Non-IgG based antibodies treatments | Barthez Auditorium

14h00 - Using IgE based antibodies to treat cancer

Elizabeth Hardaker | VP of Biology | Epsilogen, UK

14h30 - De novo high-throughput isolation of humanized VHH domains with favorable developability properties following camelid immunization

Stefan Zielonka | Global Head of Antibody Discovery & Protein Engineering | Merck Healthcare KGaA | Professor of Biomolecular Immunotherapy | Technical University of Darmstadt, Germany

15h00 - Avidity Engineering : a next frontier in the development of differentiating antibody therapeutics

Simone Oostindie | Director Research & Discovery | GYES, Netherlands

15h30 - Targeting tumor microenvironment with human antibodies demonstrating improved developability properties

Anne Chevrel | Head of Discovery | Mabqi, France

14h30 - Engineered monoclonal IgA for the treatment of cancer

Mitchell Evers | Antibody Scientist | Utrecht University, Netherlands

15h00 - Streamlining Therapeutic Antibody Development with a Homogeneous Bioluminescent Immunoassay for Signaling Pathway Analysis

Hicham Zegzouti | Senior Research Scientist - Group Leader | Promega, USA

15h30 - Low-volume, automation friendly protein characterization

Dora Quispe | Field Applications Scientist | Unchained Labs, Germany

15h40 Coffee Break - B2B Meetings | Exhibition Hall

16h00 Pitch Session : Innovative Approaches and New trend Technologies | Einstein Auditorium

16h00 - Assessing the immunomodulatory effects of Immune Checkpoint Antibodies using 3D cell co-culture models

Marcin Krzykawski | CEO | Real Research, Poland

Workshop ENOTTA - European Network on Optimising Treatment with Therapeutic Antibodies in chronic inflammatory diseases (ENOTTA): Assembling a Multidisciplinary Puzzle | Barthez Auditorium

Olga Pitsillidou | Officer in the Pharmaceutical Care Team | Health Insurance Organization Cyprus (HIO) & University of Groningen

16h10 - Generation of nano-antibodies using extracellular vesicles for diagnostic purposes

Clara Bouyx | Post-Doc CNRS (Operations manager of the LabCom NVDIAG) | Laboratoire d'Ingénierie des Systèmes Macromoléculaires (LISM), France

16h20 - APL-1030, a Novel High-Affinity Nanofitin Inhibitor of C3-Mediated Complement Activation

Mathieu Cinier | CSO | Affilogic, France

16h30 - A new technology for lysosomal targeted degradation of extracellular and membrane proteins: antibody engineering with mannose 6-phosphate analogues

Ilaria Basile | R&D manager | NanoMedSyn, France

16h40 - Tumor associated macrophages targeting with a new specific monoclonal antibody

Mary Poupot | Researcher | Centre de Recherche en Cancérologie de Toulouse, Inserm, France

16h50 - A novel Fc-engineered cathepsin D-targeting antibody enhances ADCC, triggers tumor-infiltrating NK cell recruitment, and improves treatment with paclitaxel and enzalutamide in triple-negative breast cancer

Emmanuelle Liaudet-Coopman | Senior Scientist, DR2 | Institut de Recherche en Cancérologie de Montpellier (IRCM) | Inserm U1194 | Université Montpellier | Institut Régional du Cancer de Montpellier (ICM), France

Azra Guzonjić | Teaching Assistant | University of Belgrade, Serbia

Ana Homšek | Teaching Assistant | University of Belgrade, Serbia

Georgios Karagigas | Professor | University of Iceland, Iceland

17h00 - Involvement of tumor microenvironment during targeted radionuclide therapy

Timothée David | Post-doctoral Researcher | Institut de Recherche en Cancérologie de Montpellier (IRCM) | Inserm U1194, France

17h10 - Leveraging Photonic Integrated Circuit (PIC) technology to advance label-free biosensing for antibody screening and Point of Care diagnostics

Joël van der Vegt | Business Development Specialist | Delta Life Science, Netherlands

17h20 - Epitope mapping case studies by Deep Mutational Scanning

Raphael Sierocki | CEO/CSO | Deeptope, France

17h30 Round table - Enhancing Investment Understanding | Einstein Auditorium

18h20 Investor's Pitch - Private Session | Barthez Auditorium

19h00 POSTER Presentation - Dinner Cocktail Reception at Exhibition Hall

20h30 Announcement of « BEST POSTER » by Biothérapie Innovation Occitanie

Program - **DAY 2 |** Friday, June 21st 2024

8h00 Welcome coffee

8h30

Efficacity and safety from preclinical to FIH trials | **Session I** | Einstein Auditorium

8h30 - Feasibility Assessment in Therapeutic Antibody Development: Leveraging PK/PD Modeling to Navigate Challenges and Mitigate Pitfalls

Lionel Renaud | PK/PD and Systems Pharmacology modeler | Lyo-X, Switzerland

09h00 - From preclinical to clinical: PK-PD modelling of an antibody drug conjugate for therapeutic index prediction

Laurence del Frari | Pharmacokineticist, Modeling & Simulation | Pierre Fabre, France

09h30 - Pharmacokinetics strategies to support First in Human studies for different biotherapeutic modalities

Antoine Deslandes | Global Head of Pharmacokinetics for Devices & Biotherapeutics | SANOFI, France

Non-oncology diseases/ next generation of immunotherapies | Barthez Auditorium

8h30 - The role of broadly neutralizing antibodies in HIV cure strategies

Ole Søgaard | Professor | Institut for Klinisk Medicin, Aarhus University, Denmark

09h00 - Multimeric complexes to unlock the therapeutic potential of innate immunity

Carole Seguin-Devaux | Head of Research Unit | Luxemburg Institut of Health, Luxemburg

09h30 - Antibody-based and CAR-T cell-based therapeutic approaches against SARS-CoV2 infections

Mireia Pelegrin | DR-CNRS, Head of Antibodies, Immunomodulation and Immunotherapy group | IRMB-INSERM U1183-CHU Saint Eloi, France

10h00 **Coffee Break - B2B Meetings** | Exhibition Hall

10h30

Efficacity and safety from preclinical to FIH trials | **Session II** | Einstein Auditorium

AI and Machine Learning for Antibody discovery and Optimization | Barthez Auditorium

10h30 - Case study on Clinical Dose Selection for TIGIT monospecific and bispecific antibodies

Pierre Ferre | VP Preclinical Development | Compugen Ltd, Israel

Alex Phipps | Executive Director. Head of Clinical Pharmacology and Quantitative Pharmacology (CPQP) - Oncology | AstraZeneca, UK

11h00 - Next Generation Accelerated GMP Quality Control from Master Cell Banks to Drug Substance release testing

Philippe Grimm | Business Development & Marketing Director | SGS Vitrology, UK

11h20 - Screening&Fluidics, a droplet microfluidics service provider for the discovery of your biological agent

Georges Gaudrialt | CEO | Screening & Fluidics, France

11h40 - Novel PK Bioanalytical Approach Using a 1.5 plex Hybrid LC-MS/MS Assay for Quantification of Total Drug (ADC/ARC) and Total Ab for Support of Non-clinical and Clinical Trials

Dawn Dufield | Scientific Officer | KCAS Bio, USA

10h30 - Computational Approaches to Antibody Optimization and Humanization

Pietro Sormanni | Group Leader, Royal Society Univ. Research Fellow| University of Cambridge, UK

11h00 - Towards an Integrated Platform for Antibody Discovery

Andrew Phillips | Head of Biologics AI Platform | SANOFI, UK

11h30 - Unlocking the potential of artificial intelligence in antibody discovery

Thomas Bourquard | CSO and co-founder | MabSilico, France

12h00 Lunch break - B2B Meetings | Exhibition Hall

13h00 Round Table «Nourrir l'innovation : Attirer et recruter les meilleurs talents dans l'industrie du Biomédicament» | Barthez Auditorium

14h00

Advancing new Antibodies approaches into the Clinic | Einstein Auditorium

14h00 - First-in-Class anti-ChemR23 pro-resolutive agonist mAbs triggers the Resolution of chronic Inflammation
Nicolas Poirier | CEO | Ose Immunotherapeutics, France

14h30 - Next-generation bispecific T cell engagers with built-in autoregulation to prevent treatment-related adverse events in adoptive T cell immunotherapies
Vincent Muczynski | Director of Biology | NovalGen Ltd | Research Fellow | University College London - Cancer Institut, UK

15h00 - From Bench to Bedside : glenzocimab journey into the clinic
Elie Toledano | Head of Scientific Affairs and Business Intelligence | Acticor Biotech, France

15h30 - Accelerating drug discovery using advanced antibody development platforms
Yu-Chih Lin | PhD. Technical specialist | Sino Biological, Germany

Innovative Approaches to overcome Bioprocessing Challenges | Barthez Auditorium

14h00 - Therapeutic Protein Charge Variant Characterization with Intact Mass and Peptide Mapping Following Microgram Preparative Capillary Isoelectric Focusing Electrophoresis Fractionation
Géry Van Vyncht | Scientific Director | Quality Assistance, Belgium

14h20 - Industrialization of biotechnology process with continuous DSP approach
David Balbuena | Director of Business Development | LFB Biomanufacturing, France

14h50 - Smart Technologies and Smart Processes to serve Downstream Process Intensification Levels
Fabien Rousset | Principal Expert - Chromatography / DSP, BPS - Separation Technologies | SARTORIUS, France

15h10 - Synthetic Biology tools to accelerate antibody development
Tatiana Konovalova | Bioinformatics R&D manager | Thermo Fisher Scientific, Germany

15h40

Closing Keynote | Einstein Auditorium

Bispecific Antibodies against infectious diseases
Luca Varani | Structural Biology Group Leader | Institute for Research in Biomedicine, Switzerland

16h10 ● Announcement of AIS2025

16h30 ● End of Congress

TALKS

DAY 1 | Thursday, June 20th 2024

Opening keynote lectures | Descartes Auditorium

Christian Klein
Distinguished Scientist, Department Head Cancer Immunotherapy Discovery 3, Head Oncology Programs & Site Head Roche Innovation Center Zurich
Roche pRED, Switzerland

Next generation bispecific antibodies and antibody fusion proteins for cancer immunotherapy

SUMMARY

In the past decade much progress has been seen in the field of bispecific antibodies. In this presentation an overview about the applications of CrossMab technology will be given that is applied in two approved bispecific antibodies, VABYSMO and COLUMVI. The discovery and development of novel 2+1 T cell bispecific antibodies that engage T cells for killing of tumor cells, with a focus on B cell malignancies and multiple myeloma will be described as well as recent developments in the field of T cell bispecific antibodies such as their application in solid tumors and their combination with co-stimulatory bispecific antibodies. Finally, the concept of a novel PD-1 cis-targeted IL2v immunocytokine will be introduced.

BIOGRAPHY

Christian Klein, Distinguished Scientist, is Department Head Cancer Immunotherapy Discovery 3, Head Oncology Programs & Site Head Roche Innovation Center Zurich, Roche pRED. He specializes in the discovery, engineering, validation and preclinical development of therapeutic/bispecific antibodies for CIT. During his >20 year Roche tenure he made major contributions to the preclinical development & approval of GAZYVA(RO) (obinutuzumab), project initiation & discovery of VABYSMO (faricimab), discovery & preclinical development of COLUMVI (glofitamab), and preclinical R&D on 25 clinical stage BsAbs, immunocytokines and fusion proteins. He lead(s) research teams developing pRED's BsAb platforms e.g. CrossMab®, 2+1 TCB, 4-1BB/CD28 costimulator, immunocytokine, next gen biologics, the P329G-CAR®-T platform. 1998 he received a diploma in biochemistry from University of Tübingen, and 2002 a doctorate from TU Munich working at the MPI of Biochemistry. 2002 he joined Pharma Research, Roche Penzberg as Postdoc in the Therapeutic Protein Initiative, 2003 became Lab and 2007 Department Head in Discovery Oncology. 2010 he joined RICZ as Head Oncology Programs, and took on additional roles 2015 as Department Head CIT-3 and 2019 as Site Head. 2017 he completed his habilitation in Biochemistry and acts as lecturer at the LMU Munich, since 2021 he is also lecturing at the University of Zürich.

Elisa Fontana
MD, PhD, Hospital Medical Director
The Sarah Cannon Research Institute in London, UK

Clinical development of bispecific antibodies and ADCs: toxicity mitigation and activity optimization strategies in expanded phase I trials

SUMMARY

Bispecific antibodies, ADCs and bispecific ADCs are rapidly moving from clinical development to standard of care, either as monotherapy or in combination with other anticancer agents. Some expected toxicities related to antibody fragments and target epitopes are in common between these drug classes and managed in a similar fashion. Some others are specifically related to payload in case of ADCs and direct immune-cell engagement in case of a sub-class of bispecifics. On-target and off-target toxicities, biomarker selection and synergistic combinations will be reviewed in the context of recent changing paradigm for phase I clinical trials.

BIOGRAPHY

Dr Elisa Fontana, MD, PhD is the Hospital Medical Director of The Sarah Cannon Research Institute in London, UK (part of HCA International and ESMO Designated Centre of Oncology and Palliative Care). She is Principal Investigator for over 40 first-in-humans to late phase clinical trials and oversees a portfolio of more than 70 active clinical trials and translational studies.

She graduated from the University of Parma, Italy in 2008 and completed her specialisation in Medical Oncology in 2014. She worked as sub-investigator in the gastrointestinal and drug development clinical trial units at The Royal Marsden Hospital, UK (2014-2019). She was awarded a PhD in colorectal cancer and biomarker assays development at The University of London, Institute of Cancer Research in 2019; she received the Chairman's Prize for outstanding PhD. She successfully completed an entrepreneurial training programme for early career researchers aiming to translate research into clinical practice. She served as co-Chair of the Adolescent and Young Adult Gastrointestinal Cancer Task Force at the European Organization for Research and Treatment (EORTC) (2019-2020) and as secretary of the EORTC Gastrointestinal Tract cancer group (2021-2024 mandate).

She received multiple academic funding as lead applicant and over 10 ESMO and ASCO Merit Awards for conference presentations; she published over 100 peer-reviewed articles, abstracts and book chapters.

Paving the way for the next-generation of Antibodies & New Modalities | **Session I** | Einstein Auditorium

Pedro Villar
Senior Scientist
Maxion Therapeutics, UK

KnotBodies: creating Ion Channel Modulating Antibodies by fusing Knottins in Antibody loops

SUMMARY

To overcome challenges in antibody discovery against ion channels and GPCRs, Maxion have developed a novel antibody fusion format (KnotBody), by fusing naturally occurring ion channel modulators (knottins) into peripheral CDR loops. This presentation will present our current progress towards developing safe, efficacious and long-acting drugs against previously undruggable targets.

BIOGRAPHY

Pedro Villar is an Associate Principal Scientist and co-founder at Maxion Therapeutics Ltd. Pedro has extensive experience in protein sciences, specializing in the production of complex membrane proteins and different antibody formats at Maxion and also at his previous role at IONTAS. Over the past six years, he has played a pivotal role in advancing the KnotBody technology, contributing significantly to the development of ion channel modulating molecules. Pedro holds a PhD in Molecular Biology from Autonomous University of Madrid.

Paula Videira
Co-founder and CTO
CellmAbs
Associate Professor and Group Leader
UCIBIO, NOVA School of Science and Technology, NOVA University
Lisbon, Portugal

From Sugars to Solutions: Advancing Cancer Therapeutics with Glycobiology

SUMMARY

Cancer-associated aberrant glycosylation represents a compelling avenue for uncovering intricate disease mechanisms, given glycans' pivotal role in cancer progression, cell differentiation, adhesion, and immune evasion. Consequently, therapeutic interventions targeting these glycans promise to harness immune responses and enhance patient outcomes. In cancers such as triple-negative breast cancer (TNBC), characterized by unmet clinical needs, specific subgroups with poorer prognoses have been identified, marked by the expression of distinct sialylated glycan antigens. These sialylated antigens, truncation products of O-glycans seldom found in healthy tissue, originate from disrupted intracellular signaling pathways. Analysis of large cancer patient cohorts' databases has unveiled transcriptome alterations associated with key players in glycosylation pathways and protein scaffolds, positively correlating with the infiltration of regulatory T cells and M2 macrophages, fostering a protumoral and immunosuppressive milieu. Despite challenges posed by low affinity and specificity, our unique platform facilitates the development of highly specific and high-affinity monoclonal antibodies (mAbs) that exhibit heightened reactivity to TNBC and various solid tumours while sparing healthy tissues. In preclinical breast cancer models, our antibodies effectively counteract immunosuppression and bolster immune responses, underscoring the therapeutic potential of sialylated antigen blockade.

BIOGRAPHY

I am Paula Videira, leader of the Glycoimmunology Research Group, Associate Professor in Immunology and Glycobiology at NOVA-FCT. I am highly motivated to comprehend the intricate roles of glycans in diseases, dedicated to translating Glycosciences into innovative immunotherapies. I co-founded and direct CDG&Allies, and in 2019, I co-founded CellmAbs, a successful spin-off developing antibody-based immunotherapies for oncology and closed in 2024 a historic negotiation with big pharmaceutical to step into clinics.

My education includes a Biochemistry degree, a MSc in Biotechnology, a PhD in Biotechnology and an Habilitation in Glycobiology from NOVA FCT (2023). I coordinated 18 EU and national projects (eg. GLYCOTwinning, ProDGNE) and I have been visiting professor at Bologna University, Harvard Medical School as EMBO and Fulbright fellow and Federal University of Ceará.

At NOVA FCT, I am a member of the Department Council, the pedagogical and the scientific committee of the Biology Programs. I am co-coordinator of the NOVA Saude group in Chronic Diseases and Infection, member of the Slovakia Academy of Sciences' scientific board and represented Portugal in the COST scientific committee (2017-2021).

Paving the way for the next-generation of Antibodies & New Modalities | **Session I** | Einstein Auditorium

Peter Molloy
Senior Fellow, Protein Engineering
Immunocore Ltd, UK

Optimizing Discovery Strategies for TCR Bispecifics

SUMMARY

ImmTAX are TCR-based, bispecific biologics that exploit T cell redirection as a mechanism-of-action to target-disease specific intracellular antigens. It is crucial to engineer an ImmTAX-pHLA engagement which results in a signaling-competent T cell response, rather than a mere high-affinity interaction. Here, we present a high-throughput method combining Jurkat-based mammalian display, functional screening, and deep-sequencing to identify potent TCR molecules as therapeutic candidates for ImmTAX engineering.

BIOGRAPHY

Dr Peter Molloy is currently a Senior Fellow at Immunocore Ltd, where he has worked for the past twenty years. He has led the development and improvement of technologies for generating TCR-based immunotherapeutics. He has contributed significant advances to the field of TCR engineering and has several publications and patents in the field. Peter completed his first degree in Microbiology at National University of Ireland, Galway. He subsequently studied for his PhD about TCR engineering under the joint supervision of Prof Harris and Dr Charlie Cunningham. He has held several research positions at the University of Aberdeen in the field of antibody engineering, including a Zeneca research fellowship.

Radha Parmar
Science & Technology Consultant, Biologics - EMA
Twist Bioscience, USA

Leveraging cutting-edge DNA technologies to build precision libraries for antibody engineering

SUMMARY

Structure-based machine-learning was leveraged to design predicted antibody binders against the GPCR target C5aR1. The CDR sequences of these predicted binders were then used to construct a de-novo phage-display library. Twist's oligo-synthesis platform enabled fabrication of a highly diverse CDR-shuffle library with excellent variant representation and with no unwanted bias or motifs. Following panning, several high-affinity leads were identified that functionally blocked C5aR1 signalling in cellular assays.

BIOGRAPHY

Radha is the Science and Technology Consultant for TWIST EMEA and a Subject Matter Expert in the area of Antibodies. Prior to Twist, Radha led the Antibody Engineering team within Biopharm Discovery at GSK and was a Program Leader taking antibody discovery projects from target validation through to candidate selection. Through her work at Twist, her interests now include synthetic biology, protein evolution, variant library generation as well as antibody discovery, optimisation and production.

Antibody-based Cancer Therapies : latest developments | Barthez Auditorium

Alain Beck
Senior Director, Biologics CMC & developability
Pierre Fabre, France

Bispecific Antibody Drug Conjugates (BsADCs): strategies and challenges

SUMMARY

Biparatopic and Bispecific Antibody–Drug Conjugates (BpADCs and BsADCs) represent two innovative therapeutic categories combining or extending the merits of ADCs and BsAbs in Oncology. BpAbs bind distinct, non-overlapping epitopes on an antigen such as HER2, MET or FRalpha. This unique binding mode enables new mechanisms of action beyond monospecific and (bsAbs). Biparatopic ADCs drive receptor crosslinking and aggregation, form large immune complexes, and enhance the internalization of ADCs. According to different combinations of targets, bispecific ADCs can be designed into dual-targeting ADCs. BsADCs engineered to recognize EGFR for example in tandem with another antigen such as MUC1, MET or HER3, potentially enhancing tumour specificity and enabling the eradication of a broader range of tumour cells. Strategies and challenges based on clinical stage Bp and BsADCs will be discussed including target selection, Bs antibody formats, linker-payloads (LP), Drug-to-Antibody ration (DAR) and conjugation as well as pre-clinical and summaries of first clinical data.

BIOGRAPHY

Dr Alain Beck is Senior Director, Biologics CMC and Developability (Pierre Fabre R&D), co-founder and Associate Editor of mAbs journal (2009, https://www.tandfonline.com/journals/kmab20) and chairman of MabDesign SAB (2014, www.mabdesign.fr). He is or was involved in +12 clinical stage biologics R&D programs including dalotuzumab/ IGF1R (Merck), telisotuzumab/ telisotuzumab vedotin/ MET (AbbVie), h515H7/ CXCR4 mAb, lonigutamab ugodotin ADC/ IGF1R, W0180 Vista mAb (PF), VERT-002/ MET (Vertical Bio), ER004 Fc-fusion protein (www.esperare.org) and lonigutamab (www.acelyrin.com). He is author/ co-author of +270 publications (h-index: 70; +17,700 citations). He has contributed to +280 scientific meetings (AIS, BAS, BioProduction, CASSS, CTDP, EAC, FOB, GlycoBiotec, PEGS, SCT, WADC, WBC, WCBP) as chairman, invited speaker, panellist, moderator, advisor, and/or organizer (IO mAbs, ADCs/BsADCs, Biobetters, Biosimilars, pAbs, Bs/MsAbs, Fc-fusions, Immunocytokines, Protein Scaffolds, Mass Spec, Med Chem, PK/PD, separative sciences). He was ranked 6/50 global antibody industry influencers (2013), was 6th WADC (2019), 10th AIS Award (2022) and Medecine Maker Power List 2024 award winner (https://themedicinemaker.com/awards/power-list/2024). He is member of the MAB Working Party (EDQM/PhEur) and involved in workshops with ANSM, EU, EMA, FDA, NIST, NMPA, USP and WHO.

Aiphi Andrée Nguyen
CEO
Skymab Biotherapeutics, France

Innovative cancer therapies based on first-in-class antibodies anti-GPCR drug conjugates

SUMMARY

G-protein-coupled receptors (GPCRs) with more than 900 members, are the largest family of cell surface signalling receptors known to play a crucial role in various functions. GPCRs correspond to 30% of all identified new therapeutic targets. The majority of approved anti-GPCR therapies are based on small molecules' agonists and antagonists. Despite the crucial role of GPCR in tumors growth and spread, the targeting of GPCR in oncology using antibodies remains largely limited. The challenging immunizations and difficulties to obtain good therapeutic antibodies are part of main reasons. With more than 20 years of research on GPCRs at the CEA, Skymab team has successfully identified interesting tumors antigens and good antibodies targeting GPCR. Our lead candidate, in the most advanced program, is an antibody drug conjugate (ADC) based on DAR8 topoisomerase inhibitors payload. The lead antibody is a humanized IgG1, screened based on high binding selectivity on tumor cells and low binding to normal cells, high internalization capacity, with silent mutation to limit unspecific cells uptake. In this presentation we will discuss our strategy for the lead antibody selection and optimization. We will share in vitro and in vivo efficacy results with our lead ADC in both solid tumors and haematological malignancies.

BIOGRAPHY

Aiphi Nguyen, is co-founder and the CEO of Skymab Biotherapeutics. Aiphi has more than 18 years experience in the pharmaceutical industry and the investment bank including various positions with Bristol Myers Squib (BMS) in medical and marketing where she gained tractions such as world successful launch in orphan diseases. Aiphi has a twofold background in pharmacy and business, is a PharmD and hold a MBA from Sorbone University, a master in corporate finance from ESCP Europe and «Challenge plus» startup certification from HEC.

Antibody-based Cancer Therapies : latest developments | Barthez Auditorium

Peter Lowe
Director Antibody Engineering
Merus, Netherlands

Merus Class of Bispecific ADC (ADClonicsTM) to Achieve Improved Binding Selectivity, Internalization and Tumor Cell Killing

SUMMARY

Merus Biclonics® fully human IgG1 large-scale screening bispecific antibody platform has given rise to multiple clinically active cancer drug candidates and can also facilitate the discovery of optimal candidates for improved ADC performance and therapeutic index. Here we demonstrate the compatibility and favorable pharmaceutical properties of Merus Biclonics® conjugated with a range of linkers and payloads to generate ADClonicsTM, with improved binding selectivity, internalization and cancer cell killing activity.

BIOGRAPHY

Claude Nogues
CSO & Co-founder
Kimialys, France

Comprehensive and Reliable Characterization of Antibody Therapeutics thanks to Kimialys's innovative SPR biochips

SUMMARY

Antibodies are versatile biologics widely used in diagnostics and therapeutics, making their characterization crucial to understand their binding properties and optimize their efficacy.
Surface Plasmon Resonance (SPR) offers label-free, real-time analysis of antibody-antigen interactions, allowing comprehensive characterization.
Kimialys has developed an innovative surface chemistry for SPR biochips, offering enhanced control over ligand orientation, accessibility, surface density and distribution. Simultaneously, this unique coating protects the surface from non-specific interactions, ensuring specific and reliable measurements in any biological matrix.
Kimialys' innovation and expertise streamline the selection of antibodies designed for specific targets, enabling precise characterization of the antibody-antigen complex's affinity and avidity as well as more specialized assays like epitope binning and FCR binding assays (studying interactions between antibodies and cell receptors).
This surface functionalization approach not only improves measurement reliability but also significantly accelerates the overall timeline for antibody selection and epitope binning. The level of control provided by the surface chemistry enhances the accuracy and efficiency of these crucial processes, ultimately contributing to the advancement of antibody-based diagnostics and therapeutics.

BIOGRAPHY

Dr Claude NOGUES is expert in physical chemistry of surfaces and interfaces, with a strong focus on biosensing and biomolecular interaction applications. She is a former team leader at the Laboratory of Biology and Applied Pharmacology (CNRS/ENS Paris-Saclay), where she worked on the development of innovative biosensing methods. With more than 25 years of research and 36 peer-reviewed scientific papers, Dr Claude NOGUES is now co-founder and scientific director at Kimialys, leveraging her expertise and know-how to enable innovative and industrial-grade in vitro analysis solutions.

Paving the way for the next-generation of Antibodies & New Modalities | **Session II** | Einstein Auditorium

Caroline Barelle
CEO & founder
Elasmogen, UK

Exploiting the advances of soloMER biologics to deliver multi-functional products for autoimmune diseases and cancer

SUMMARY

Elasmogen's proprietary biologics platform, soloMERs, has delivered a pipeline of multi-functional, disease targeting domains with differentiated binding interactions resulting in new mechanisms of action. Our pipeline focus is to deliver multi-functional products for the treatment of immune-related diseases including targeted soloMER drug conjugates and orally delivered bi-specific products. Building on this multi-functional product approach and to fully exploit the small, highly specific, high affinity advantages of our soloMER platform, we have also developed radiotherapeutic products for the treatment of solid tumours to license to the growing number of companies acquiring assets and companies in this space. We have also partnered successfully to deliver a shared risk pipeline of soloMER drug conjugates for the treatment of solid tumour cancers.
My talk will take the audience through the advantages of our soloMER technology through to in vivo preclinical data demonstrating their efficacy in disease models.

BIOGRAPHY

Caroline is CEO and founder of Elasmogen, a company that discovers and develops soloMER biologics for the treatment of inflammatory diseases and cancer. She has successfully led teams at Wyeth and Pfizer in Global Bio-therapeutic Technologies progressing early platform technologies to late-stage clinical development. She has been awarded a prestigious Royal Society of Edinburgh Enterprise Fellowship, is a doctoral graduate from the University of Aberdeen in Biochemistry and an MBA (distinction) from Robert Gordon's University, Business School. Caroline is a member of the Opportunity North East Life Sciences Board, a member of the GVV board committed to investing in women's health, a member of the Medicines Manufacturing Innovation Centre advisory Board, sits on the Royal Society's Science and Industry Translation Committee and an honorary Professor at Queen's University Belfast.

Stefan Zielonka
Global Head of Antibody Discovery & Protein Engineering
Merck Healthcare KGaA
Professor of Biomolecular Immunotherapy
Technical University of Darmstadt, Germany

De novo high-throughput isolation of humanized VHH domains with favorable developability properties following camelid immunization

SUMMARY

Camelid derived VHH domains are versatile building blocks for the construction of bi- and multispecific antibody architectures. In this talk, I will present examples on how VHHs can be exploited for the activation of immune cell subsets by engineering efficient effector cell engager as well as by constructing cytokine mimetics. However, one obstacle relies in the foreign nature of camelid derived VHHs with respect to biomedical applications. We have recently described a novel library approach for the isolation of fully humanized VHH domains following camelid immunization. I will also describe this process that is based on engrafting the immunized CDR3 repertoire onto humanized backbone libraries followed by yeast surface display.

BIOGRAPHY

Stefan received his PhD in chemistry from Technische Universität Darmstadt in 2015. At moment he works as Senior Director and Global Head of Antibody Discovery & Protein Engineering at Merck Healthcare KGaA as well as Professor of Biomolecular Immunotherapy at Technische Universität Darmstadt. Stefan holds a habilitation in Biochemistry.

Paving the way for the next-generation of Antibodies & New Modalities | **Session II** | Einstein Auditorium

Simone Oostindie
Director Research & Discovery
GYES, Netherlands

Avidity Engineering : a next frontier in the development of differentiating antibody therapeutics

SUMMARY

BIOGRAPHY

Anne Chevrel
Head of Discovery
Mabqi, France

Targeting tumor microenvironment with human antibodies demonstrating improved developability properties

SUMMARY

Specific targeting of tumor microenvironment is key in antibody mediated therapies to improve efficacy and reduce off-tumor toxicity. To this end, Mabqi has developed a proprietary technology enabling the generation of human pH-sensitive antibodies that are preferentially active in the acidic tumor micro-environment[1]. This technology is based on the use of a highly developable pH-sensitive antibody library, named pHuscI2TM. Combining phage and yeast display core technology and thanks to a streamlined discovery to preclinical process, Mabqi has identified and characterized such pH-sensitive antibodies against various tumor antigens. The antibodies demonstrated in vitro pH-sensitive binding capacities, internalization, and (in the ADC format) cytotoxic effect at acidic pH while no effect was observed at physiological pH. Finally, a range of developability assays have been carried out to confirm that antibodies from the Mabqi's library are ready for industrial development.

[1] Huber et al. Seminar in cancer biology, V43, pp74-89, ap 2017

BIOGRAPHY

Anne Chevrel has joined Mabqi in 2023 as head of discovery. She leads the discovery of Mabqi's antibodies for customer and internal programs, always integrating appropriate technologies to develop mabqi's know-how and capabilities. After a PhD in protein engineering and biotechnology, she has 10 years' experience working as program lead for discovery and development on bio-therapeutics and biotech applications.

Discovery and Development on Non-IgG based antibodies treatments | Barthez Auditorium

Elizabeth Hardaker
VP of Biology
Epsilogen, UK

Using IgE based antibodies to treat cancer

SUMMARY

BIOGRAPHY

Elizabeth Hardaker is the VP of Biology at Epsilogen where she leads the preclinical programs supporting the company's pipeline of IgE based therapeutics. Elizabeth has more than 15 years experience in the pharmaceutical industry. Most recently, Elizabeth was a Senior Director at AstraZeneca leading a team supporting preclinical research in Oncology. Prior to that Elizabeth worked at Evotec in the Inflammation and immunology group and Novartis in the Respiratory group. Throughout her career Elizabeth has been the biology lead on a number of projects from across the drug discovery process ranging from target validation to those in clinical trials. Elizabeth has a PhD from the National Heart and Lung Institute, Imperial College and a Masters in Biochemistry from Bath University.

Discovery and Development on Non-IgG based antibodies treatments | Barthez Auditorium

Mitchell Evers
Antibody Scientist
Utrecht University, Netherlands

Engineered monoclonal IgA for the treatment of cancer

SUMMARY

IgA is one of the five antibody isotypes in humans and is best known for its large presence in the mucosal layers of the body as dimeric or polymeric IgA. In its monomeric form, we believe IgA is a well-suited isotype for therapeutic application in oncology. Due to the favorable FcR interaction profile on granulocytes, monocytes, and macrophages, strong activation of these cells can be accomplished through the use of IgA. Cells that are activated through IgA harbor a unique killing apparatus, which differs from the mechanisms employed by IgG1 antibodies. Since IgA does not directly bind to C1q, its use can be beneficial for indications where complement activation is not desired, such as neuroblastoma. Finally, IgA could be used as a method to specifically recruit neutrophilic MDSCs in the tumor microenvironment against cancer. However, there are inherent drawbacks to IgA that hamper its therapeutic use, including issues with developability, pharmacokinetics, and in vivo translatability. In my talk, I will address the steps we have taken to mitigate these issues and how to employ IgA optimally for oncology.

BIOGRAPHY

Dr. Mitchell Evers performed his PhD in 2015 on IgA for lymphoma and neuroblastoma. Later, he worked as a scientist at the spin-off company TigaTx to bring IgA towards the clinic. Now, he is acting as the program manager Biologics for Oncode accelerator, a Dutch national growth fund initiative which aims to to parner with academia and biotech to bring novel biologicals to the clinic.

Discovery and Development on Non-IgG based antibodies treatments | Barthez Auditorium

Hicham Zegzouti
Senior Research Scientist - Group Leader
Promega, USA

Streamlining Therapeutic Antibody Development with a Homogeneous Bioluminescent Immunoassay for Signaling Pathway Analysis

SUMMARY

Therapeutic antibodies represent a pivotal advancement in medicine, offering targeted treatments for diverse diseases. Understanding downstream cellular signaling events following antibody treatments is essential for optimizing their efficacy and safety profiles. We introduce Lumit, a novel solution-based immunoassay combining immunodetection with bioluminescent enzyme subunit complementation. Unlike traditional methods, such as ELISA or Western, Lumit omits washing, liquid transfer, and immobilization, enabling cell lysis in the same well as detection antibody binding and luminescence generation, streamlining the process. We demonstrate Lumit's effectiveness in detecting therapeutic antibody-mediated inhibition of multiple signaling pathways, quantifying changes in target protein levels and phosphorylation. Using examples like EGFR, we highlight Lumit's utility in assessing antibody impacts on crucial signaling nodes. Our data reveals Lumit's potential for providing insights into antibody-mediated alterations in cellular signaling. Lumit cellular immunoassay represents a versatile and potent tool for therapeutic antibody development. It streamlines the analysis of various signaling pathways, facilitating the rapid identification of pathway-specific chemical or biologic inhibitors. This new approach promises to enhance the precision and efficiency of therapeutic antibody research and development.

BIOGRAPHY

Dora Quispe
Field Applications Scientist
Unchained Labs, Germany

Low-volume, automation friendly protein characterization

SUMMARY

BIOGRAPHY

Marcin Krzykawski
CEO
Real Research, Poland

Assessing the immunomodulatory effects of Immune Checkpoint Antibodies using 3D cell co-culture models

SUMMARY

The discovery of immune checkpoint proteins like PD-1/PDL-1 and CTLA-4 marks a significant advancement in cancer immunotherapy. Consequently, humanized monoclonal antibodies targeting these proteins have been successfully utilized in patients suffered from hard-to-treat-cancers: metastatic melanoma, renal cell carcinoma, head and neck, and non-small cell lung. In the face of rapidly evolving checkpoint inhibitors, a significant gap in research is the lack of appropriate preclinical in vitro models that would facilitate the verification and examination of the immunomodulatory activity of designed antibodies.

In our study, we presented a potency of 3D co-culture models of cancer cells and PBMCs (Peripheral Blood Mononuclear Cells) and we indicated their use in further stages of drug efficacy testing and immuno-oncology studies. We used protein-based hydrogel for creating 3D cell co-culture of cancer and immune cells. Using the FDA-approved immune checkpoint antibodies (anti-PD-1/PDL-1, anti-CTLA-4 and anti-VISTA) we demonstrated the new in vitro model on which the immune-stimulatory effects of antibody-treatment were verified. We delivered the methodology and results for: 3D tumor cell killing assay (live/dead staining, colorimetric assay), PBMCs' cell proliferation study, and cytokines' examination. Furthermore, the morphological parameters of tumor spheroids after co-culture with immune cells were assessed using AnaSP software. What is more, we confirmed that not only immortalized cancer cells but also 3D structures of patient-derived tumoroids (PDT) or patient-derived xenograft models (PDX) may be used in 3D co-culture with immune cells for immuno-testing purposes. We finally confirmed the phenomena that in our model the 3D structures grow on top of the hydrogel making them accessible to large molecules and enabling reliable testing of their immunomodulation: antibodies, Antibody-Drug-Conjugates (ADCs), cytokines, CAR-T therapy, oncolytic viruses, etc.

The versatility and scalability of our 3D co-culture immuno-oncology make them suitable for a wide range of applications in activity-testing and mechanistic studies. They can be customized to address specific research questions or therapeutic targets and accommodate screening and validation of immunostimulatory drugs in preclinical research. Furthermore, we open new area in investigating mechanisms of action in immunotherapy and personalized medicine approaches for selecting optimal treatment strategies and effects of immunotherapy using Monoclonal Antibodies, Antibody-Drug Conjugates and other "large" molecules.

Our research addresses the need for improved preclinical models for testing immunotherapeutic antibodies. By providing a platform that enables rapid and accurate evaluation of antibody immunostimulatory effects, we help streamline the drug development process and accelerate the translation of promising therapies from the lab to the clinic. By providing more predictive preclinical models, our technology reduces the likelihood of late-stage drug failures.

BIOGRAPHY

Real Research founder and CEO, PhD in medical sciences, 14 years of experience on developing 3D cancer models with 20 models generated. Characteristic: extensive knowledge about developing 3D cell culture models and using them in drug discovery. Marcin received several business trainings like "Ignite" Judge business school at Cambridge University, "IMPULSE" business training at Cambridge Maxwell Center and Kauffman Foundation business training among others. He is an alumnus of FNP (Polish Foundation for Science) and co-author of 3 patents.

Clara Bouyx

Post-Doc CNRS (Operations manager of the LabCom NVDIAG)

Laboratoire d'Ingénierie des Systèmes Macromoléculaires (LISM), France

Generation of nano-antibodies using extracellular vesicles for diagnostic purposes

SUMMARY

Membrane proteins (MPs) on the surface of cells are involved in many biological processes, such as cell signaling or viral infection, and play an essential role in regulating the immune response. Consequently, they account for a large majority of the markers used as therapeutic or diagnostic targets. Currently, there is an increase demand of monoclonal antibodies (Abs) in the field of immunotherapy and diagnostic with approximately 175 therapeutic Abs marketed, and at least 1200 therapeutic Abs undergoing clinical evaluation. In the meantime, the purification process of these MPs is long, random, costly and generally results in small quantities of proteins, often unstable. Most importantly, the use of detergents for their extraction disturbs their native conformation because they do not stabilize membrane domains as effectively as the natural membrane lipids. For these reasons, Abs are usually generated against the soluble extracellular domains of MPs. Unfortunately, this leads to Abs that may behave differently when used on targets in their native state on cell surface.

In response to that issue, we set up the LabCom NVDIAG, a partnership between the Host-Pathogen Interaction team from the LISM laboratory (CNRS) and the BioCytex company. We developed a technology using extracellular vesicles (EVs) expressing MPs at their surface, and we demonstrated through structural studies using electron microscopy that they are in native conformation (glycosylation, oligomerization state). This reveals original epitopes that do not exist on the extracellular domains on MPs, offering the potential to develop innovative Nano-Abs against a wide range of targets, even those known to be difficult. We especially work on the development of Nano-Abs that are non-competitive with therapeutic Abs, which could be used in quantitative Flow Cytometry (qFC) and ELISA-based companion diagnostic tests for monitoring treatment, particularly in cancer immunotherapy.

By displaying antigens in their native conformation, EVs expressing MPs represent a powerful tool to further investigate epitope mapping, structural studies or interaction studies.

Among other targets, we work on CD38 which is highly expressed on the plasma cells (PC) of multiple myeloma (MM) patients. So far, 2 therapeutic monoclonal Abs Isatuximab and Daratumumab are currently used for patients in clinic. Nevertheless, down regulation of CD38 on cell surface remains controversial since there is no commercial Abs that bind to CD38 independently to Isatuximab and Daratumumab. Using NVDIAG strategy we manage to generate suitable Nano-Abs for monitoring the total number of CD38 molecules on PC in real time. Such Nano-Abs would be used in qFC for assessment of the total CD38 receptor density. In combination with a competitive antibody, the CD38 receptor occupancy can also be monitored.

CD38 is expressed mainly in hematopoietic immune cells, playing a role in modulating effector functions during inflammation and regulate cell recruitment, cytokine release, and NAD availability. Anti-CD38 drugs are used for patients with MM and are currently under clinical investigation for various autoimmune diseases such as systemic lupus erythematosus, rheumatoid arthritis and multiple sclerosis among others. NVDIAG opens up new opportunities for diagnosis and treatment monitoring, particularly for the determination of Minimal Residual Disease.

BIOGRAPHY

After obtaining a degree in Biology, I graduated from the ENSCBP engineering school in 2017. In 2021, I completed a CIFRE thesis in microbial and enzymatic engineering with LALLEMAND, in the Toulouse Biotechnology Institute: I carried out the characterization of S. cerevisiae in both an experimental and industrial context. In 2022, at Toulouse White Biotechnology, I took part in the production of a molecule of pharmaceutical interest by microbial means.
By working at the interface between academic research and industry, I was able to acquire skills in microbiology, molecular and cellular biology, while using a variety of analytical tools.

Mathieu Cinier
CSO
Affilogic, France

APL-1030, a Novel High-Affinity Nanofitin Inhibitor of C3-Mediated Complement Activation

SUMMARY

Alternative scaffold technologies such as the Nanofitins have the potential to expand further the scope of targeted biologics, in addition to what is already explored with antibodies and derivatives (fragments and multispecifics). Challenges still remain toward their development as therapeutics and filling these gaps partly requires to find the applications where they make a difference. With respect to complement associated diseases, the neutralizing antibody targeting C5 (Eculizumab) was found poorly active in Age-Related Macular Degeneration (AMD) and cannot be addressed directly to the brain to treat central nervous system (CNS) related diseases. In contrast, APL-1030, a Nanofitin-based C3 inhibitor has been rationally design to inhibit the complement cascade and be amenable for the treatment of AMD as well as other complement related pathologies. The crystal structure of the Nanofitin:C3 protein complex has been resolved, highlightening a particular mode of interaction allowing the neutralization of both C3 and its C3b derivative. APL-1030 inhibits the complement cascade regardless of the activation pathways (classical or alternative). APL-1030 is compliant to both synthetic and recombinant expression system, which opens up different perspectives for its on-going development as a therapeutic lead. More specifically, a very low endotoxin level is paramount when considering direct injection in the eye or intrathecal delivery. Synthetic manufacturing of the Nanofitin allows a careful management of the endotoxin contamination and reaching levels that are difficult to obtain using recombinant routes.

BIOGRAPHY

Affilogic is a privately-owned biotech company specializing in the discovery and development of a novel class of protein therapeutics called Nanofitins. Mathieu Ciner joined Affilogic in 2011 and assumed the role of Scientific Director in 2015. In this capacity, he successfully led over 100 Nanofitin generation programs for various applications, including the development of innate and adaptive immunity modulators, tumor radioimaging agents, targeted drug conjugates as well as biodistribution modulators including Nanofitin-based shuttle. Collaborating with Apellis Pharmaceuticals and other undisclosed international pharmaceutical companies, he is currently overseeing the development of Nanofitin-based biotherapeutics, with two IND-enabling studies in progress.

Ilaria Basile
R&D manager
NanoMedSyn, France

A new technology for lysosomal targeted degradation of extracellular and membrane proteins: antibody engineering with mannose 6-phosphate analogues

SUMMARY

Targeted protein degradation is a promising approach to improve the efficacy of therapeutic antibodies. The AMFA glycovectors, analogues of the mannose 6-phosphate, have been developed by NanoMedSyn to achieve the degradation of challenging proteins involved in different diseases. AMFA-engineered antibodies acquire an affinity for the cation-independent mannose 6-phosphate receptor (M6PR), a major transporter in the endolysosomal network. Moreover, the binding to the neonatal Fc receptor (FcRn) is not affected and the AMFA-antibodies have the same recycling capacity in vitro and in vivo as the unmodified antibodies. Due the M6PR binding, the internalization of AMFA-antibodies together with their antigens, either soluble or membrane ones, is significantly increased and is associated with a drastic antigen degradation in lysosomes. Finally, the efficacy of AMFAs in enhancing the therapeutic potential of the engineered antibodies directed against various targets has been demonstrated in vivo in different preclinical models. This innovative technology can be applied to therapeutic antibodies or antibody-constructs to generate a new class of potent therapeutics for a variety of diseases.

BIOGRAPHY

Head of Preclinical Development at NanoMedSyn. PharmD, PhD in Biochemistry, she has an expertise in lysosomal targeting for therapeutics engineering. She joined NanoMedSyn in 2014 and her work on the engineering of enzyme replacement therapies for lysosomal diseases led to the Orphan Drug Designation for a Pompe disease treatment modified by AMFA glycovectors. She is now exploring the potential of NanoMedSyn glycovectors to enhance the therapeutic efficacy of monoclonal antibodies and other therapeutic formats.

Mary Poupot
Researcher
Centre de Recherche en Cancérologie de Toulouse, Inserm, France

Tumor associated macrophages targeting with a new specific monoclonal antibody

SUMMARY

We produced and patented a monoclonal antibody, which specifically recognizes and binds M2/anti-inflammatory polarized macrophages and human tumour associated macrophages (TAM) from different pathologies such as lymphomas, melanoma, lung cancer, carcinomas, and breast cancer. Interestingly, this mAb called 6-25 did not bind healthy peripheral blood mononuclear cells (PBMC), M1/pro-inflammatory polarized macrophages or cells from different tumor cell lines except the AML cell line MV4-11. We showed that the naked 6-25 mAb has no direct toxicity on M2 macrophages targeted but they internalize it. We therefore produced a 6-25 drug conjugate with pyrrolobenzodiazepin (PBD) and obtained a specific in vitro toxicity of this 6-25-PBD on human M2 but not M1 macrophages. The 6-25 mAb targeting also the MV4-11 cells, we performed xenografts in mouse and showed that the 6-25 mAb was able to specifically target the tumor. Moreover, we showed that this antibody could penetrate and target M2 macrophages inside spheroids constituted by a coculture of a cancer cell line and M2 polarized macrophages. TAM, are by now established as important regulators of tumour progression by impacting on tumour immunity, angiogenesis, metastasis and response to treatments. Our project is thus to develop the 6-25 mAb for cancer therapies.

BIOGRAPHY

Mary Poupot received her Ph.D. degree in biochemistry from the University of Paul Sabatier, Toulouse, France, in 1997. From 2001 to 2007, she was a Postdoctoral Fellow at the Center of Physiopathology of Toulouse Purpan. She was interested in the activation of human lymphoid cells in cancer. Since 2007, she has been a permanent Researcher at the Cancer Research Center of Toulouse. Her current research interests are based on the impact of the tumor microenvironment on the survey of cancer cells, and particularly on protumor associated macrophages.

Emmanuelle Liaudet-Coopman
Senior Scientist, DR2
Institut de Recherche en Cancérologie de Montpellier (IRCM) - Inserm U1194
Université Montpellier
Institut Régional du Cancer de Montpellier (ICM), France

A novel Fc-engineered cathepsin D-targeting antibody enhances ADCC, triggers tumor-infiltrating NK cell recruitment, and improves treatment with paclitaxel and enzalutamide in triple-negative breast cancer

SUMMARY

Introduction: Triple-negative breast cancer (TNBC) prognosis is poor. Immunotherapies to enhance the antibody-induced natural killer (NK) cell antitumor activity are emerging for TNBC that is frequently immunogenic. The aspartic protease cathepsin D (cath-D), a tumor cell-associated extracellular protein with protumor activity and a poor prognosis marker in TNBC, is a prime target for antibody-based therapy to induce NK cell-mediated antibody-dependent cellular cytotoxicity (ADCC). This study investigated whether Fc-engineered anti-cath-D antibodies trigger ADCC, their impact on anti-tumor efficacy and tumor-infiltrating NK cells, and their relevance for combinatory therapy in TNBC.

Methods: Cath-D expression and localization in TNBC samples was evaluated by western blotting, immunofluorescence, and immunohistochemistry. The binding of human anti-cath-D F1M1 and Fc-engineered antibody variants, which enhance (F1M1-Fc+) or prevent (F1M1-Fc-) affinity for CD16a, to secreted human and murine cath-D was analyzed by ELISA, and to CD16a by surface plasmon resonance and flow cytometry. NK cell activation was investigated by flow cytometry, and ADCC by LDH release. The anti-tumor efficacy of F1M1 Fc-variants was investigated using TNBC cell xenografts in nude mice. NK cell recruitment, activation and cytotoxic activity were analyzed in MDA-MB-231 cell xenografts by immunophenotyping and RT-qPCR. NK cells were depleted using an anti-asialo GM1 antibody. F1M1-Fc+ antitumor effect was assessed in TNBC patient-derived xenografts (PDXs) and TNBC SUM159 cell xenografts, and in combination with paclitaxel or enzalutamide.

Results: Cath-D expression on the TNBC cell surface could be exploited to induce ADCC. F1M1 Fc-variants recognized human and mouse cath-D. F1M1-Fc+ activated NK cells in vitro and induced ADCC against TNBC cells and cancer-associated fibroblasts more efficiently than F1M1. F1M1-Fc- was ineffective. In the MDA-MB-231 cell xenograft model, F1M1-Fc+ displayed higher antitumor activity than F1M1, whereas F1M1-Fc- was less effective, reflecting the importance of Fc-dependent mechanisms in vivo. F1M1-Fc+ triggered tumor-infiltrating NK cell recruitment, activation and cytotoxic activity in MDA-MB-231 cell xenografts. NK cell depletion impaired F1M1-Fc+ anti-tumor activity, demonstrating their key role. F1M1-Fc+ inhibited growth of SUM159 cell xenografts and two TNBC PDXs. In combination therapy, F1M1-Fc+ improved paclitaxel and enzalutamide therapeutic efficacy without toxicity. Conclusions: F1M1-Fc+ is a promising immunotherapy for TNBC that could be combined with conventional regimens, including chemotherapy or antiandrogens.

This work was published J Immunother Cancer. 2024 Jan 30;12(1):e007135. doi: 10.1136/jitc-2023-007135.

Timothée David
Post-doctoral Researcher
Institut de Recherche en Cancérologie de Montpellier (IRCM)
Inserm U1194, France

Involvement of tumor microenvironment during targeted radionuclide therapy

SUMMARY

Background: With the approval of new radiopharmaceuticals by the European Medicines Agency and the Food and Drug Administration targeted radiotherapy (TRT) has emerged as a game-changer for the management of neuroendocrine tumours (NET) and prostate cancer. However, in spite of these successes, there is a need to increase response rates and the survival benefit for patients in future. It is known that conventional external beam radiotherapy can induce immunogenic cell death and activate immune system (Golden & Apetoh, 2015). The role of dendritic cells and T lymphocytes in radiotherapy was highlighted by Demaria's group (Demaria 2004; 2012). In the last decade, significant advances in the understanding of the mechanisms involved have been achieved (Vanpouille-Box 2017; Ablasser 2019). It was also shown that radiation dose and dose fractionation modulate immune response via cGAS-STING pathway activation. Recently, our team showed that tumor response to TRT was improved in immunocompetent mice as compared with immunodeficient mice (Constanzo et al., in prep).
Project description: Here we investigated the role of injected activities used for TRT on the modulation of anti-tumor immune response.
Materiel & Methods: Biodistribution of 177Lu-anti HER2 mAbs was determined in BALB/c mouse orthotopically grafted mouse model of breast cancer (TUBO) and used for absorbed dose assement (in Gy). Therapeutic efficiency and toxicity of various activities (1-10MBq) of 177Lu-anti HER2 mAbs were next investigated. Multi-colors flow cytometry was next used on samples to monitor and characterize immune-related properties of tumor cells treated with TRT. In vitro, immunogenicity markers of irradiated TUBO cells was investigated.
Results: TRT led to significant increase in mice median survival (MS) for activities above 1 MBq, with MS increasing from 23 days (control group) to 33 days at 1 MBq (Gy to tumors) and to more than 120 days at 7 and 10 MBq (Gy to tumors), respectively. Toxicity was rather moderated. We showed that re-challenging mice by tumour grafting of TUBO on opposite flank was more efficient in the mice having received the lowest activities highlighting the involvement of immune system activation during TRT. Immunophenotyping of tumours and of circulating blood is ongoing. These data were supported by in vitro data showing the release of DAMPs during TRT.

Conclusion: This study showed TRT-related modulations of immune system. This opens new perspectives for the use of combinatorial approaches based on immune checkpoint

BIOGRAPHY

Timothée David was a PhD under the supervision of Dr Emmanuelle Liaudet-Coopman and Dr Thierry Chardès at Institut de Recherche en Cancérologie de Montpellier (IRCM, "Breast Cancer, Microenvironment and Immunotargeting") – France. His PhD was focused on immune-properties and therapeutic efficiency of anti-cathepsin D antibodies used in immunocompetent mouse models of breast cancers. MAbImprove Labex environment helped him to developed a strong interest concerning immunostimulatory effects of therapeutics and their potential uses for combination. Currently under the supervision of Dr Jean-Pierre Pouget and Dr Julie Constanzo, he works about immunostimulatory effects of radioimmunotherapy.

Joël van der Vegt
Business Development Specialist
Delta Life Science, Netherlands

Leveraging Photonic Integrated Circuit (PIC) technology to advance label-free biosensing for antibody screening and Point of Care diagnostics

SUMMARY

Background
The ongoing advancements in therapeutic antibodies and biologics increase the need for advanced technologies to meet the demands of drug and diagnostic development. Traditional methods, hindered by limited sensitivity or high costs, slow down progress. Photonic Integrated Circuit (PIC) technology addresses these challenges, pushing forward biotherapeutic innovations.

Offer Description
We have developed a biosensor leveraging PIC technology, featuring ring resonators embedded in a silicon chip for enhanced light-molecule interactions through evanescent field sensing. This design allows label-free, highly sensitive detection of biomolecules and biomarkers, key for drug discovery and diagnostics. PIC chips, made from silicon nitride using standard computer chip fabrication techniques, offer a scalable and cost-effective alternative to existing biosensing platforms.
The architecture of PIC chips supports multiple ring resonators on a single chip, facilitating multiplexed biosensing. This capability enables simultaneous detection of various analytes from a small sample, significantly increasing throughput and utility for high-throughput drug screening and complex diagnostic assays.
Advanced contactless edge coupling of the chip within the system architecture minimizes space requirements, ensuring a compact and robust design. This small footprint is especially suited for space-constrained labs and crucial for point-of-care testing (POCT), enhancing adaptability and performance in healthcare settings.

Innovative Strength & Comparative Advantages
One of the significant benefits of using photonic integrated circuits for label-free biosensing is their versatility across various phases of the drug development pipeline, from initial discovery through to clinical trials and diagnostics. By making high-throughput and multiplexed screening more accessible, PIC technology not only reduces time and cost associated with drug development but also advances breakthroughs in personalized medicine and targeted therapies.
Additionally, as the system's architecture allows for compact designs suitable for POCT, enabling diagnostic tests on the same platform on which they were developed. This integration increases the success rate of newly developed diagnostic assays and is invaluable in settings that demand rapid diagnoses, such as intensive care units and chronic disease management.

Economically, the scalability of complementary metal oxide semiconductor (CMOS) fabrication processes significantly reduces the cost per assay. Mass production of PIC sensors can dramatically decrease costs, broadening access to advanced diagnostics and drug screening for a diverse range of healthcare providers and researchers.

Conclusion

PIC technology not only revolutionizes label-free biosensing by enhancing sensitivity and reducing costs but also adapts seamlessly to the needs of modern drug development and diagnostics. This could range from protein characterisation and high-throughput antibody screening to diagnostic assays with multiple biomarkers and real-time therapeutic drug monitoring. By offering a scalable, cost-effective solution that supports rapid and accurate testing across various healthcare environments, PIC technology sets a new standard in the biotherapeutic industry.

BIOGRAPHY

With a Master's degree in bio-pharmaceutical sciences, I launched my career at Delta Diagnostics, focusing on making label-free biosensing available to all researchers in the field. This perfect position uniquely marries my passion for technology with my enthusiasm for drug development research and the pharmaceutical industry, allowing me to contribute meaningfully to innovations that could reshape healthcare diagnostics. My journey at Delta Diagnostics has been a fulfilling blend of science and strategic business application.

Pitch Session : Innovative Approaches and New trend Technologies | Einstein Auditorium

Raphael Sierocki
CEO/CSO
Deeptope, France

Epitope mapping case studies by Deep Mutational Scanning

SUMMARY

Protein-protein interactions are critical for a wide range of cellular functions. In particular, the amino acids involved in the formation of antibody (mAb) / antigen complexes are of great interest to the pharmaceutical industry, as functional properties depend on them. Here we present a high-throughput, in vitro, time-efficient and exhaustive technology to determine the epitope (whether conformational or linear) of mAbs. Using Deep Mutational Scanning, we generated libraries containing all possible single mutants for a specific antigen, that were displayed on the surface of yeast cells. Taking advantage of the non-competitive binding of two antibodies to the same antigen (when available), populations of single mutants causing a loss of affinity for only one of the two antibodies were sorted by FACS. Sequencing results of each sorted population were analyzed, allowing the key residues for each antibody to be clearly identified. These results are strongly supported by fine correlation with available antibody / antigen complexes PDB structures. Case studies were carried out on 4 antigens: AGR2, CD25, HER3 and PDL1.

BIOGRAPHY

Raphael holds a PhD in protein engineering and immunology from CEA Paris Saclay. He is the developer and specialist of the technologies used at Deeptope.

TALKS

DAY 2 | Friday, June 21st 2024

Lionel Renaud
PK/PD and Systems Pharmacology modeler
Lyo-X, Switzerland

Feasibility Assessment in Therapeutic Antibody Development: Leveraging PK/PD Modeling to Navigate Challenges and Mitigate Pitfalls

SUMMARY

The success of a therapeutic antibody in treating human diseases depends not only on finding a safe and efficacious dose but also on patient acceptance of new treatment options in the context of existing alternative therapies. Our presentation underscores the pivotal role of early implementation of pharmacokinetic/pharmacodynamic (PK/PD) modeling in providing a rational decision-making framework during preclinical and early clinical development. By integrating diverse data sources, PK/PD modeling becomes instrumental in guiding candidate selection and optimizing experimental designs. Drawing on both our experience and literature examples, we explore how to address challenges such as reduced antibody exposure due to target-mediated drug disposition (TMDD), factors influencing effect duration (target turnover, antibody-target binding affinity), target cross-reactivity, and antibody immunogenicity in preclinical species. The discussion extends to antibody engineering strategies, including half-life extension and pH-dependent target binding. The presentation illustrates how PK/PD modeling and simulations, in synergy with experimental data, can effectively overcome the challenges of therapeutic antibody development, either steering towards successful clinical development or prompting the early abandonment of targets deemed undruggable with the pursued approach.

BIOGRAPHY

Lionel Renaud got his MSc in Bioengineering from the Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, in 2014. He performed his Master research thesis at Harvard Medical School in Boston, USA, analysing functional magnetic resonance imaging (fMRI) data. Since 2015 he is working as PK/PD and Systems Pharmacology modeler for LYO-X AG, supporting customer decisions at various stages of drug development: early preclinical development, translation from animal to human for first in human dose estimation, dose and regimen selection for phase II clinical studies, population PK/PD modeling of phase III clinical studies to support registration. His main expertise is the pharmacology of biotherapeutics, including antibodies, bispecifics, antibody-drug conjugates and peptides, in the areas of oncology, infectious diseases, inflammatory diseases, hematology, ophthalmology and various rare diseases.

Laurence del Frari
Pharmacokineticist, Modeling & Simulation
Pierre Fabre, France

From preclinical to clinical: PK-PD modelling of an antibody drug conjugate for therapeutic index prediction

SUMMARY

W0101 is an Antibody Drug Conjugate (ADC) currently under development designed for treatment of patients with tumors overexpressing membrane Insulin-like Growth Factor 1 receptors (IGF-1R). The objective of the modelling and simulation work was to predict W0101 potential efficacious and safe doses in patients using information from preclinical tumor growth inhibition (TGI) studies in xenograft mice and toxicology studies in monkeys.

A pharmacokinetic-pharmacodynamic (PK-PD) model in mice was developed to describe the relationship of pharmacokinetics with TGI. ADC and payload serum and intra-tumoral concentrations were included in the model. The tumor static concentration (TSC) where the tumor growth and killing rates nullify each other was characterized. On the safety side, a mechanistic based model was developed to characterize ADC-induced blood cell toxicity.

A PK model for W0101 in patients was developed using phase I data. This model was used to perform simulations for various dosing regimens. The simulated concentrations were compared to the TSC according to several criteria to guide efficacious dose selection and occurrence of blood cell adverse events were simulated. PK/PD modelling for efficacy and safety gathering all non-clinical and clinical data supported the selection of phase 2/3 doses.

BIOGRAPHY

Laurence Del Frari has over 25 years of experience in modelling & simulation in Pharmacokinetics and Pharmacodynamics applied to pharmaceutical research and development across various disease areas, including small and large molecules. She has worked in several pharmaceutical companies. In her current role as an expert in PKPD modelling & simulation at Pierre Fabre Laboratories, she is contributing to the early and late stage development and registration of new oncology and dermatology drugs. In this role, she defines modelling & simulation strategy in drug development, including population approach, physiologically based pharmacokinetic modelling as well as well as Quantitative System Pharmacology to support trial protocols, analysis plans, study reports and regulatory submissions.

With a Pharmacy diploma (Pharm D) from Paris University and a specialization in Pharmacokinetics & Metabolism and in statistical modeling and simulation, her focus is to promote and apply innovative methods to optimize data knowledge, trial efficiency and support quantitative decision making in drug development.

Efficacity and safety from preclinical to FIH trials | **Session I** | Einstein Auditorium

Antoine Deslandes
Global Head of Pharmacokinetics for Devices & Biotherapeutics
SANOFI, France

Pharmacokinetics strategies to support First in Human studies for different biotherapeutic modalities

SUMMARY

By year-end 2022, the number of biologic approvals outpaced that of small-molecule new molecular entities. The therapeutic biologics pipeline is changing, as companies are developing new modalities for a diverse array of molecular targets.
First-in-human (FIH) trials are milestone bridges translating the lessons learned from preclinical studies to further clinical development phases. They are conducted primarily to determine the safe dose range for further clinical development. Regulatory guidelines provide a framework consisting in sequential parts: characterization of the pharmaco-toxicological effects in vitro and in animals, prediction of human exposure, prediction of human response, and mitigation of potential risks arising from unknowns and uncertainties. Therefore, selecting a FIH dose requires the integration of data from many disciplines. While PK prediction for biologics has been largely successful, some additional translational steps could further enhance efficacious dose prediction accuracy in clinical development.

BIOGRAPHY

Antoine graduated in Pharmacy, then received his PhD in Clinical Pharmacology from the Paris University, with subsequent Masters in "Modelling and Statistics" and "Immunology and Biotherapy".

Before joining Sanofi in 2006, he held different positions in nonclinical and clinical PK, in several pharma and biotech companies.
Currently Antoine Deslandes, has 2 roles at Sanofi. One role is within R&D, as Global Scientific Advisor in Translational Medicine and Early Development, as an expert of PK/PD of Therapeutic Proteins. His other role is within Manufacturing and Supply, in the Drug Device Integration unit, to support early application of subcutaneous devices and technologies in clinical projects.

Ole Søgaard
Professor
Institut for Klinisk Medicin, Aarhus University, Denmark

The role of broadly neutralizing antibodies in HIV cure strategies

SUMMARY

As the neutralization potential and mechanisms of action of broadly neutralizing antibodies (bNAbs) become increasingly clear, the current major challenge is to design HIV cure strategies that exploit bNAbs' full potential. This presentation will be focused on reviewing the promising data that has emerged from recent clinical trials and discussion the challenges that must be considered to optimized the impact of bNAbs on HIV persistence. These challenges include: 1) combining potent bNAbs that target separate epitopes and testing for sensitivity are essential to counteract viral resistance; 2) boosting immune responses through immune modulators and therapeutic vaccines may be necessary to overcome immune exhaustion, and 3) timing and duration of interventions may play a critical role, and there is an increasing interest for early intervention at ART initiation in PWH. Building upon the recent observations, new trials are now underway that will generate further insights into what is needed to take HIV cure and treatment strategies to the next level.

BIOGRAPHY

Dr. Søgaard is an infectious disease physician at the Department of Infectious Diseases at Aarhus University Hospital, Denmark, and a professor at the Department of Clinical Medicine, Aarhus University. After receiving his PhD in HIV epidemiology in 2011, he transitioned his research focus to experimental research in virus infections. In 2015-2016, Dr. Søgaard was a visiting researcher in the Nussenzweig Laboratory of Molecular Immunology at The Rockefeller University, New York. As a physician-scientist with extensive training both in basic science immunology/ virology and clinical medicine. His research lab is focused on the understanding of virus pathogenesis and persistence, including clinical investigations into immune modulation therapies, broadly neutralizing antibodies, and reversal of HIV-1 latency.

Non-oncology diseases/next generation of immunotherapies | Barthez Auditorium

Carole Seguin-Devaux
Head of Research Unit
Luxemburg Institut of Health, Luxemburg

Multimeric complexes to unlock the therapeutic potential of innate immunity

SUMMARY

Immunotherapeutic approaches have revolutionized cancer therapies and raised a valid expectation in the field of infectious diseases. Most of the immunomodulatory approaches in clinical practice engage the adaptive immune system. Complement proteins or NK cells are key players to unlock the therapeutic potential of innate immunity in a broad field of human diseases. We have developed immunotherapeutic complexes that selectively activate the complement pathways and/or NK cell responses on targeted cells or pathogens using multimerizing scaffolds. Complement-activating Multimeric immunotherapeutic compleXes (CoMiX) selectively activate the complement alternative pathway on HER2-overexpressing cancer cells and Pseudomonas Aeruginosa by exploiting factor H (FH)-related proteins that compete with factor H for C3b binding, resulting in the local activation of the alternative complement amplification loop. CoMiX induce direct killing of HER2 cancer cells and Pseudomonas Aeruginosa, activate NK cells, enhance phagocytosis mediated by macrophages and inhibit tumor growth in xenografts in NUDE mice. Besides, we designed NK cell Multimeric immunotherapeutic compleXes and NK cell engagers that stimulate NK cell activation cytotoxicity towards HIV-1 infected cells, cancer cells and Pseudomonas aeruginosa.

BIOGRAPHY

Dr. Carole Devaux focused her research on translational virology and the modulation of the host immune responses in infectious diseases. She earned a PhD in Immunology (University of Medicine of Nancy) and a post-doctorate on Immune Tolerance in T cells (University of Pittsburgh). Her research group is dedicated to the development of antibody-based drugs harnessing innate immunity. Her research interests include the activation of complement and NK cells on targeted cells and pathogens to stimulate broad antiviral, antibacterial and antitumor immune responses.

Mireia Pelegrin
DR-CNRS, Head of Antibodies, Immunomodulation and Immunotherapy group
IRMB-INSERM U1183-CHU Saint Eloi, France

Antibody-based and CAR-T cell-based therapeutic approaches against SARS-CoV2 infections

SUMMARY

Unlocking the potential of broadly reactive coronavirus monoclonal antibodies (mAbs) and their derivatives offers a therapeutic avenue against severe COVID-19, especially crucial for safeguarding high-risk populations. Novel mAb-based immunotherapies may help address the reduced efficacy of current vaccines and neutralizing mAbs caused by the emergence of variants of concern (VOC). Using phage display technology, we discovered a pan-SARS-CoV-2 mAb (C10 mAb) that targets a conserved region of SARS-CoV-2 and demonstrates exceptional efficacy in recognizing all assessed VOC strains, including the latest Omicron variants. While C10 lacks direct neutralization capacity, its proficiency in binding infected cells and inducing the lysis of lung epithelial cells via antibody-dependent cellular cytotoxicity (ADCC) highlights the significance of the potential use of non-neutralizing mAbs in the battle against infection. Building upon this pan-SARS-CoV-2 mAb, we engineered C10-based CAR-T cells endowed with efficient killing capacity against SARS-CoV-2-infected lung epithelial cells. Notably, C10-based CAR-T cells exhibit robust proliferation capacity and reduced expression of exhaustion cell surface markers. Our study unveils a pan-SARS-CoV-2 mAb effective in targeting infected cells and offers a proof-of-concept for the potential application of CAR-T cell therapy in combatting SARS-CoV-2 infections. Furthermore, it holds promise for the development of innovating antibody-based and cell-based therapeutic strategies against severe COVID-19 by expanding the array of therapeutic options available for high-risk populations.

BIOGRAPHY

Dr. Mireia Pelegrin obtained her Veterinary degree in Barcelona. She next did a PhD at the Autonomous University of Barcelona focused on the development of transgenic mice as models of diabetes. Then, she moved to France for a post-doctoral training at the Institute of Molecular Genetics of Montpellier to work in the development of gene and cell therapy approaches for in vivo production of therapeutic monoclonal antibodies (mAbs), project that led to two international patents. In 2000, Dr. Pelegrin became Senior Researcher at the CNRS in the same institute where she was a Project leader of a research program on antiviral immunotherapies. In 2019, she moved to the Institute for Regenerative Medicine and Biotherapies of Montpellier to lead the group "Antibodies and Immunomodulation". Dr. Pelegrin has a long-term experience in the study host-pathogens interactions as well as in antiviral immunotherapies. She has pioneered the proof-of-concept that mAb-based immunotherapies can induce long-term protective adaptive immune responses (vaccine-like effects). She has published over 40 articles in the field of immunovirology and antiviral immunotherapies. Her current work aims at developing innovative immunotherapies based on mAbs, antibody-derived molecules and cell therapies. Her work also aims at deciphering and harnessing antibody-mediated immunomodulation mechanisms for therapeutic strategies.

Efficacity and safety from preclinical to FIH trials | **Session II** | Einstein Auditorium

Pierre Ferre
VP Preclinical Development
Compugen Ltd, Israel

Alex Phipps
Executive Director. Head of Clinical Pharmacology and Quantitative Pharmacology (CPQP) - Oncology
AstraZeneca, UK

Case study on Clinical Dose Selection for TIGIT monospecific and bispecific antibodies

SUMMARY

BIOGRAPHY

Philippe Grimm
*Business Development & Marketing Director*John Lambert
SGS Vitrology, UK

Next Generation Accelerated GMP Quality Control from Master Cell Banks to Drug Substance release testing

SUMMARY

BIOGRAPHY

Efficacity and safety from preclinical to FIH trials | **Session II** | Einstein Auditorium

Georges Gaudrialt
CEO
Screening & Fluidics, France

Screening&Fluidics, a droplet microfluidics service provider for the discovery of your biological agent

SUMMARY

The screening of biological agents is becoming an indispensable pillar of biotechnology routines, particularly for drug discovery and in vitro diagnostics from human or animal samples. Droplet microfluidics technology allows a scale analysis of unique biological objects through the encapsulation of these objects in pico-reactors formed by small droplets of water of about 40µm in diameter, in an insulating oil within microfluidic channels. These droplets are manipulated in microdevices built and controlled by methods borrowed from the microelectronics industry.
Screening&Fluidics is a service company providing ultra-high-throughput (uHTS) single-cell screening services using its GotaHit fluorescence-activated droplet sorting (FADS) platform. Our polyvalent team will assist you in the down scaling of your biological assay should it be simple or complex, phenotypic or functional. Then, we will sort tens of millions of cells based on this screening assay within a day. This platform can significantly shorten the discovery process of your antibodies or your biological agents. It can also be a powerful tool for identifying very rare events like circulating tumor cells. Should you have very specific screening needs, our experienced team will deploy its experience in machine design and tailor-made lab-on-a-chip systems to offer you tailored and high-performance solutions.

BIOGRAPHY

Georges Gaudriault brings 25 years of experience in Drug Discovery, Drug Delivery and Molecular Pharmacology. After completing his PhD, he initiated an international career in San Diego as a postdoctoral fellow. Upon his return to France, he served as R&D scientist at Institut Curie before turning to the private sector. He served as Chief Scientific Officer of several biotechs like MedinCell and Deinove. His vision for the potential of droplet microfluidics in the biotech and pharma industries pushed the creation of Screening & Fluidics.

Dawn Dufield
Scientific Officer
KCAS Bio, USA

Novel PK Bioanalytical Approach Using a 1.5 plex Hybrid LC-MS/MS Assay for Quantification of Total Drug (ADC/ARC) and Total Ab for Support of Non-clinical and Clinical Trials

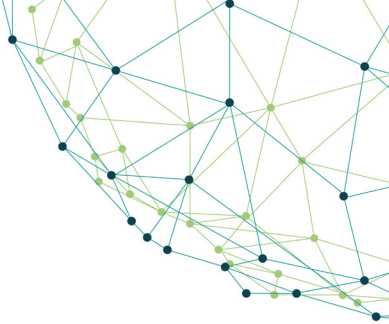
SUMMARY

The age of therapeutic conjugation is upon us! Bioanalysis for support of next generation Antibody Drug Conjugates (ADCs) and Antibody siRNA Conjugates (ARCs) have exploded recently due to the efficacy and safety that these therapies offer for immuno-oncology, rare diseases, vaccines and potentially many other diseases.

Recently, we have seen the role of hybrid LC-MS/MS in the analysis of antibody-drug conjugates (ADC) increase due to the complexity and number of bioanalytical assays needed to support this modality in the drug development process. Antibody drug conjugates tend to consist of a toxic small molecule payload attached via a linker to an antibody. The application of these drugs had mainly been in oncology where their mode of action is for the antibody to attach at the desired target site with subsequent release of the small molecule to combat tumor cells.

Having a therapeutic entity with multiple distinct components means that we need to have analytical methodologies for various components. Recently, we have seen a trend towards the complete ADC analyses being done by LC-MS/MS.

Hybrid LC-MS/MS can easily be used to monitor both the total antibody as well as the ADC conjugate in a variety of species and matrices with performance characteristics that meet industry guidelines/standards. Depending on the type of conjugation and linker used (site-specific vs Cys or Lys conjugation and cleavable vs non-cleavable,) and what reagents are available, hybrid LC-MS/MS offers several strategies or advantages to monitor the various constituent parts of the ADC. In many cases some of these assays can even be multiplexed to allow detection of various components from the same sample. This is most applicable following an affinity capture step with cleavable linkers that can release the payload upon digestion with papain for detection of the ADC while digestion with trypsin produces a surrogate peptide representing the total antibody. The ability to approach the analysis from different angles to gain multiple insights into the analyte can increasingly nudge the decision towards the use of LC-MS/MS. In many preclinical cases, we can even use "generic" methods which make the method development and analysis much quicker and cost effective. At the very least, the availability of hybrid LC-MS/MS as an alternative technology greatly increases your chances of success in the bioanalysis of antibody drug conjugates.



A novel 1.5 plex for support of ADCs/ARCs has a multitude of benefits for support of drug development from solving sample volume issues, sensitivity, impact on critical reagents, time, and quality.
This poster/presentation will give an overview and strategy of ADC bioanalysis as well as a couple case studies that provide a novel PK bioanalytical approach using a 1.5 plex Hybrid LC-MS/MS assay for quantification of total drug (ADC or ARC) and total Ab for support of non-clinical and clinical trials, where multiple assays/components are analyzed from the same sample or extraction thereby ensuring more synergistic data between assays with less variability as well as benefiting from the need for less total sample volume for the bioanalysis.

BIOGRAPHY

Dawn R. Dufield is the Scientific Officer for Mass Spectrometry at KCAS Bio. She has been at KCAS since 2018 and was previously with Pfizer for over 20 years working in the quantitative large and small molecule LC-MS/MS field. She was one of the early pioneers of using immunoaffinity combined with LC-MS/MS to offer additional selectivity which is now commonly referred to as Hybrid LCMS and is a co-author on a white paper on recommendations for validation of LCMS-based bioanalytical methods for protein biotherapeutics. She has been working on the Bioanalysis of ADCs for over 15 years and has contributed to a book chapter on this topic. She has numerous publications in her field and is an active member of AAPS and ASMS.

Pietro Sormanni
Group Leader, Royal Society Univ. Research Fellow
University of Cambridge, UK

Computational Approaches to Antibody Optimization and Humanization

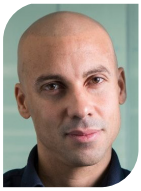
SUMMARY

Available technologies for antibody discovery and optimization have made significant strides but still face limitations. Screening procedures are often laborious, and simultaneous optimization of multiple biophysical traits remains challenging due to trade-offs between properties like affinity, stability, and solubility. Yet, the stringent requirements of therapeutic applications imply that in many cases these traits must be optimised beyond their typical natural levels. Computational approaches offer a promising solution, being rapid, cost-effective, and requiring minimal resources. This presentation explores computational design methods that enable the prediction and modulation of antibody developability potential, through the co-optimization of multiple biophysical properties with high success rates. Additionally, we introduce an AI framework for the rapid assessment of antibody humanness and nanobody nativeness. This framework serves as a powerful tool for the rapid humanization of nanobodies — an increasingly important class of therapeutic agents. By harnessing computational techniques, our goal is to streamline antibody discovery and optimisation, fostering advancements in the development of therapeutic and diagnostic agents.

BIOGRAPHY

Pietro Sormanni is a Royal Society University Research Fellow and leads a research group at the University of Cambridge that sits at the interface between computation and in vitro experiments. The group research is primarily focused on the development of innovative technologies for computational antibody design, aimed at transforming the ways antibodies are currently discovered and optimised. Through numerous collaborations and industry partnerships, their work has demonstrated the potential for computational approaches to complement established procedures and streamline antibody development, offering novel, time- and cost-effective alternatives. Prior to his current position, Pietro was a Borysiewicz Biomedical Sciences Fellow at the University of Cambridge, and he holds a PhD in Chemistry and an MSc in Theoretical Physics.

AI and Machine Learning for Antibody discovery and Optimization | Barthez Auditorium



Andrew Phillips
Head of Biologics AI Platform
SANOFI, UK

Towards an Integrated Platform for Antibody Discovery

SUMMARY

Antibodies and related biologics are highly successful therapeutics that continue to experience substantial growth. While antibody discovery remains costly and time-consuming, recent advances in machine learning, combined with state-of-the-art computational methods, have the potential to significantly accelerate the discovery process. This talk presents ongoing efforts at Sanofi to develop an end-to-end software platform for antibody discovery, by integrating data management, lab automation and machine learning. We highlight the computational methods being deployed, including methods developed within Sanofi, the software components being integrated, and some of the external partnerships that are helping to catalyse this initiative. We also outline some of the challenges that remain, both technical and organisational, together with future opportunities for this type of platform.

BIOGRAPHY

Andrew is Head of Biologics AI Platform at Sanofi, where he leads a global interdisciplinary team to develop an integrated platform for biologics discovery. He was previously Director of Bioinformatics in Biologics Engineering at AstraZeneca, and Head of Biological Computation at Microsoft Research, where he worked for 16 years to pioneer the development of computational methods for designing molecular and genetic circuits. He is the recipient of the MIT Technology Review TR35 award for work on computer-assisted genetic engineering, and of the Rozenberg Tulip Award for influential contributions to the field of molecular programming.

Thomas Bourquard
CSO and co-founder
MabSilico, France

Unlocking the potential of artificial intelligence in antibody discovery

SUMMARY

MAbSilico is a pioneer company in the TechBio sector, dedicated to developing and delivering cutting-edge artificial intelligence (AI)-based solutions for antibody drug design and discovery. Our in-silico solutions significantly mitigate the risks associated with conventional antibody discovery methods.
MAbSilico's unique approach integrates 3D modeling, interaction simulation, and linear sequence analysis. This comprehensive strategy allows defining antibody drug candidates meeting crucial parameters: high epitope specificity, high binding affinity, low off-target risk, cross-species reactivity, and high developability. These factors ensure the candidates are well-positioned for successful biological activity evaluation.
During this presentation, MAbSilico will delve into the applications of our solutions. They combine independent solutions for antibody characterization, developability assessment, and lead optimization. Furthermore, we will showcase how these solutions can be strategically combined for:
- In-silico selection from antibody libraries
- Synergistic phage display with computational tools for epitope-driven design
- Targeting diverse applications within the field of infectiology
By harnessing the power of AI, MAbSilico is revolutionizing the landscape of antibody drug design and discovery, paving the way for the development of next-generation therapeutics.

BIOGRAPHY

Thomas Bourquard holds a PhD in bioinformatics from Paris-Saclay University. He worked at INRIA (Nancy), INRA (Tours) and the Baylor College of Medicine (Houston, Texas) where he was involved in Intelligence Advanced Research Projects programs Activity (IARPA). He has a strong expertise in AI and deep learning applied to structural biology, docking, and genomics.

Advancing new Antibodies approaches into the Clinic
| Einstein Auditorium

Nicolas Poirier
CEO
Ose Immunotherapeutics, France

First-in-Class anti-ChemR23 pro-resolutive agonist mAbs triggers the Resolution of chronic Inflammation

SUMMARY

Resolution of inflammation is elicited by proresolving lipids, which activate GPCRs to induce neutrophil apoptosis, reduce neutrophil tissue recruitment, and promote macrophage efferocytosis. Transcriptional analyses in up to 300 patients with Inflammatory Bowel Disease (IBD) identified potential therapeutic targets mediating chronic inflammation. We found that ChemR23, a GPCR targeted by resolvin E1, is overexpressed in inflamed colon tissues of severe IBD patients unresponsive to anti-TNF– or anti-–4–7 therapies and associated with significant mucosal neutrophil accumulation. We also identified an anti-ChemR23 agonist antibody that induces receptor signaling, promotes macrophage efferocytosis, and reduces neutrophil apoptosis at the site of inflammation. This ChemR23 mAb accelerated acute inflammation resolution and triggered resolution in ongoing chronic colitis models, with a significant decrease in tissue lesions, fibrosis and inflammation-driven tumors. Our findings suggest that failure of current IBD therapies may be associated with neutrophil infiltration and that ChemR23 is a promising therapeutic target for chronic inflammation

BIOGRAPHY

Nicolas Poirier has 18+ years of experience in immunotherapy biotechs from target discovery, preclinical and translational drug development and multiple partnerships with large pharmaceutical companies.
Nicolas Poirier has been Chief Scientific Officer of OSE Immunotherapeutics since 2016 and CEO from 2022. He joined the company in 2009 as project leader and then as director of scientific programs. Nicolas holds a Ph.D. in immunology and has a strong expertise in the development of immunotherapies. His role at OSE has been to implement innovative therapeutic strategies on new targets and pathways in immunology addressing severe pathologies with high therapeutic need in immuno-oncology and Inflammation, thus making a robust contribution to the Company's growth. Along with his teams, Dr. Poirier continues pursuing the identification of novel innovative immunotherapies and translating them into first-class clinical-stage assets. He has been instrumental in the development of OSE Immunotherapeutics, notably as the initiator of 6 programs in the Company's portfolio that are now in clinical stage. He also played a major role as CSO and/or CEO in the signature of 6 strategic pharmaceutical partnerships.

He is the author of 50+ high-level international publications and 50+ patents in the area of immunotherapy.

Vincent Muczynski
Director of Biology
NovalGen Ltd
Research Fellow
University College London - Cancer Institut, UK

Next-generation bispecific T cell engagers with built-in autoregulation to prevent treatment-related adverse events in adoptive T cell immunotherapies

SUMMARY

BIOGRAPHY

Advancing new Antibodies approaches into the Clinic
| Einstein Auditorium

Elie Toledano
Head of Scientific Affairs and Business Intelligence
Acticor Biotech, France

From Bench to Bedside : glenzocimab journey into the clinic

SUMMARY

BIOGRAPHY

Yu-Chih Lin
PhD. Technical specialist
Sino Biological, Germany

Accelerating drug discovery using advanced antibody development platforms

SUMMARY

Sino Biological leads the way in therapeutic antibody discovery by seamlessly integrating cutting-edge technologies. Our approach combines hybridoma phage display and single B cell techniques, facilitating the development of high-affinity therapeutic antibodies or nanobodies. To further enhance antibody affinity, we employ AI-mediated antibody maturation, utilizing 3D modelling to potentially increase affinity by up to 1000 times.

Moreover, our capabilities extend to expressing various antibody formats, including conventional IgG, fragment antibodies, and bispecific antibodies. Addressing the demand for functional antibody screening, we offer high throughput cell-based and cell-free platforms capable of rapidly expressing up to 1000 antibodies. This integration expedites screening of vast antibody libraries, identifying tailored candidates for specific therapeutic targets. With these innovations, Sino Biological leads the forefront of antibody discovery, continuously pushing the boundaries of therapeutic antibody research.

BIOGRAPHY

Dr. Lin serves as a technical specialist at Sino Biological Europe, offering expertise in recombinant proteins, antibody products, and CRO services. Prior to joining Sino Biological in Frankfurt, Dr. Lin worked as a field application scientist at Sycell, specializing in spatial proteomics.

Géry Van Vyncht
Scientific Director
Quality Assistance, Belgium

Therapeutic Protein Charge Variant Characterization with Intact Mass and Peptide Mapping Following Microgram Preparative Capillary Isoelectric Focusing Electrophoresis Fractionation

SUMMARY

The imaged isoelectric focusing (icIEF) has been established as the standard technique for profiling charge heterogeneity, which is a critical quality attribute (CQA) of biotherapeutics. The in-depth characterization of individual charge variants by mass spectrometry, however, requires either collecting fractions of charge variants with traditional ion exchange chromatography (IEX), or by coupling the capillary electrophoresis directly to mass spectrometry (CE-MS).

In this study, we used the new MauriceFlexTM CE platform (Bio-Techne) featuring the icIEF based fractionation. The collected fractions were analyzed by high resolution MS (both intact mass and peptide mapping methodologies).

Glenzocimab (Acticor Biotech), a humanized monoclonal antigen-binding fragment (Fab), was used as a practical case study to identify unknow species observed on the icIEF electropherogram.
Intact mass analysis showed the formation pyroGlu at the N-terminus in fractions with pI~9.14, while glycation in fractions of pI~9.1, and presence of oxidation in fractions with pI~9.02.
Peptide mapping analysis showed high percentage of deamidation of an LC peptide in fractions with pI ~ 9.02, and the glycation of a Fd peptide in fractions with pI~9.08.
Quantitation based on icIEF signals showed that 15% of the total antibody exhibits deamidation and 5% exhibits a glycation.

BIOGRAPHY

PhD thesis in Analytical Sciences (Mass Spectrometry) at University of Liège (Belgium) and post-doc fellowship at the Institute of Reference Materials and Measurements (EC-JRC IRMM-Geel (BE)). Joined Quality Assistance (Donstiennes, BE) CRO in 2001 with different roles from R&D Scientist to Operations / R&D Director. Switched to GSK Vaccines Technical R&D in Rixensart (BE) from 2016 to 2021. Back to Assistance in Jan' 2022 as Scientific Director, Strategy & Innovation / R&D Department.

David Balbuena
Director of Business Development
LFB Biomanufacturing, France

Industrialization of biotechnology process with continuous DSP approach

SUMMARY

In 2020, demand for manufacturing of antiCOVID molecule has exploded This talk presents how LFB Biomanufacturing succeeded to reply to customer in an emergency context in 2020 and supply shortage with DSP continuous solutions.

- Reuse of consumables and single Use chromatography Membranes
- On line Dilution and On line concentration
- Intensification of Monoclonal antibody Capture using continuous chromatography

BIOGRAPHY

Graduated as Biotech engineer, David has 28 years of experience in GMP manufacturing and process development of biomolecules. He started his career at Sanofi (antibiotics and steroids) then moved to Merck Serono (recombinant proteins and Monoclonal antibodies). David joined LFB Biomanufacturing in 2014 to lead GMP manufacturing then process development. In 2023, David joined the commercial operations as Business Development Director.

Innovative Approaches to overcome Bioprocessing Challenges | Barthez Auditorium

Fabien Rousset
Principal Expert - Chromatography / DSP, BPS - Separation Technologies
SARTORIUS, France

Smart Technologies and Smart Processes to serve Downstream Process Intensification Levels

SUMMARY

Since decades, mAbs upstream processes improved their performances but the downstream purification part now represents the bottleneck for many bioprocesses.
The industry has found some solutions in the food and pharmaceutical processes like multi-column chromatography (MCC) or flowthrough. Today many DSP are using chromatography and filtration in a more continuous way addressing a part of the problem regarding consumables usage, time of operations, productivity...
But new constraints emerged like the complexity of molecules (BsAb, ADC…), target cost of drug with biosimilars, sustainability and flexibility that forced biomanufacturers to develop innovative smart technologies in parallel of process intensifications trends.
The talk provides a non-exhaustive list of innovative chromatographic solutions (multimodal, rapid cycling, tag-affinity…) and combinable equipment to fit various manufacturing scenario with variable process intensification levels (connected, continuous, flowthrough…).

BIOGRAPHY

After a Ph.D. in polymer chemistry from Paris, joined PALL Biosepra during 8 years as R&D Manager, then 5 years at Novasep as Head of product management for low pressure and High Performance consumables and equipment, for batch and continuous processes, then 5 years at Daicel as Head of a small BU to develop innovative chromatographic solutions and then since 3 years at Sartorius as Head of Product Management and now as Chrom Business expert

Tatiana Konovalova
Bioinformatics R&D manager
Thermo Fisher Scientific, Germany

Synthetic Biology tools to accelerate antibody development

SUMMARY

Gene synthesis provides rapid access to nearly any DNA sequence, irrespective of its origin or complexity. Its reliability, flexibility, and swift turnaround time offer distinct advantages over traditional cloning methods. In this presentation, we will showcase how synthetic biology and efficient cloning techniques can significantly accelerate the development of therapeutic antibodies and address the challenges inherent to their development.

BIOGRAPHY

Tatiana Konovalova is the Manager of Bioinformatics/R&D at Thermo Fisher GeneArt. Joining the team in 2015 as a bioinformatician, she has contributed to projects involving production planning algorithms, machine learning, and API development. In 2023, she transitioned to her current managerial role after leading the development of the GeneArt Dashboard, an online tool for ordering synthetic biology products. Tatiana holds a master's degree in Genetics from the University of Novosibirsk, Russia.

Closing keynote lecture | Einstein Auditorium

Luca Varani
Structural Biology Group Leader
Institute for Research in Biomedicine, Switzerland

Bispecific Antibodies against infectious diseases

SUMMARY

Bispecific antibodies are sufficiently mature to be deployed against infectious diseases, with functions not achievable to monoclonals and increased resistance to escape mutations. We will present the design and characterization of potent bispecifics capable of protecting from all SARS-CoV-2 variants (COVID-19), highlighting strategies and properties beneficials for virtually any other infectious disease.

BIOGRAPHY

Chemistry degree (Milan Univ. ITA); PhD at the prestigious MRC-Laboratory of Molecular Biology (Cambridge Univ. UK). Postdoc at Stanford (USA) with a long term EMBO fellowship.
Worked on RNA regulation of gene expression and RNA drug targeting during his PhD. Moved to structural immunology during his postdoc.
He leads the Structural Biology group of the Institute for Research in Biomedicine (Bellinzona, CH).
They strive to understand the molecular properties allowing antibodies to eliminate a pathogen, merging molecular and cellular biology, biophysics and computational simulations for structure-function studies and engineering of new antibodies with desired properties.

Last authorship for design, production and characterization of bispecific antibodies against SARS-CoV-2 (Nature; Science Imm), Zika (Cell) and Prion (Plos Path; Nat Struc Mol Biol), as well as describing the role of target affinity modulation in Chimeric Antigen Receptors against Acute Myeloid Leukemia (Mol Therapy). Collaborative work to determine the antibody response to infection in Dengue (Cell Host and Microbe), Zika (Science), Malaria (Nat Med) and SARS-CoV-2 (Nat Imm).
He leads one of the few groups with high impact publications attesting the ability to approach antibody-pathogen interactions both experimentally and computationally.

He is the founder of CLBiotech (2022), a start-up focused on nanobody discovery and engineering.

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