

# Mosbacher Kolloquium

March 23 - 25, <mark>20</mark>23

Immune Engineering Pfrom Molecules to Therapeutic Approaches

Program

# Scientific Board

Dorothee Ambrosius Senior Advisor Biopharma / Laupheim [DE]

> **Dirk Busch** [DE] Technical University of Munich

> **Matthias Feige** [DE] Technical University of Munich

**Christian Klein** Roche Innovation Center /Zurich [CH]

# **Meeting Secretariat**

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German Society for Biochemistry and Molecular Biology (GBM) Mörfelder Landstr. 125 60598 Frankfurt am Main

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Dear Friends and Colleagues,

The traditional spring meetings of the German Society for Biochemistry and Molecular Biology (GBM) are held annually in the picturesque town of Mosbach to promote the exchange of scientific ideas, discuss emerging themes and to foster the education of young scientists.

The scientific theme of the 74th meeting is "Immune Engineering – from Molecules to Therapeutic Approaches".

Harnessing the power of our immune system is currently emerging as the most promising avenue for previously uncurable diseases. Antibodies remain the mainstay of immune therapy and still hold major opportunities for the future. Engineering immune cell communication by tailor-made cytokines or directly editing the cells of our immune system as living drugs are exciting current developments in the field.

The Mosbacher Kolloquium in 2023 will bring together academic and industrial leaders in these fields. This will allow to obtain an overview over the stateof-the-art but also chart future developments in basic science and clinical translation.

We will provide a platform for fruitful scientific exchange of ideas that helps inspiring young scientists in their future research endeavors in this rapidly developing field.

We wish all of you a wonderful conference, lively exchange and fruitful contacts.

Matthias Feige Dorothee Ambrosius Christian Klein Dirk Busch











Market place



#### Arrival and registration

16:00

DFG: Career Options for Graduates of Life Sciences

#### Nikolai Raffler, DFG /Bonn [DE]

This talk is aimed at Master and PhD Students as well as early Post-Docs in Life Sciences. It will provide an overview on the diversity of career options with a practical example of a Program Officer at the German Research Foundation (DFG). Elaborating on the funding opportunities of the DFG it will also provide young researchers an overview of how to kick-off a career in academia. (Registration required)

20:00 (City hall) 18:00 (Lecture hall)

#### Brief Introductory lecture ("Primer")

A short intro on immune therapy and

engineering - aimed at undergraduates/gradu-

ate students

(delivered by the organizers)

#### Welcome reception /Get together

The steering committee of the German Society for Biochemistry and Molecular Biology (GBM) and the city of Mosbach invite you to a welcome reception in the town hall of Mosbach (no registration required)

We thank the city of Mosbach for the kind hospitality.





08:50	<b>Opening remarks</b> by the scientific organizers
	Session 1 (09:00 - 12:00) Next generation antibody-based immunothe- rapies (Novel concepts: The scientific basis) (Chair: Ch. Klein)
00:60	<b>David Ho</b> /New York [USA] Antibody Evasion Properties of SARS-CoV-2 Variants
06:30	Early career investigator talk 1 <b>Marlitt Stech</b> /Potsdam [DE] Design and generation of antibody-drug conju- gates using non-canonical amino acids
09:45	Harald Kolmar /Darmstadt [DE] Immune-Cell Engagement in Tumour Therapy: From Bispecific to Multispecific Antibodies
	Coffee break (10:15 - 10:45)
11:15 10:45	Mark Cragg /Southampton [UK] Engineering antibodies for immune stimulation
11:15	Early career investigator talk 2 Leonie Kolmar /Lausanne [CH] Droplet microfluidic antibody screening plat- form for functional antibodies at the single-cell level
11:30	Adi Barzel /Tel Aviv [IL] In vivo engineered B cells secrete high titers of broadly neutralizing anti-HIV antibodies in mice

Lunch break (12:00 - 13:00)

2:00 - 12:45 (Tenne)

12:00 - 13:00 (Schalander

Industrial Lunch Session Fluidic Analytics Ltd. /Cambridge [UK]

#### Maya Wright

Introducing the Fluidity One-M, a novel system for quantifying the humoral immune response directly in serum or plasma

(Registration required, Lunch provided)

#### Meet the Prof with Erika Pearce

(Chairs: S. Stelzig & H. Schiller)

In an informal atmosphere you will get the chance to ask the questions that keep you up at night - e.g. how do I make a career in science? Did the speaker have fun on his/her scientific path and which experiences were decisive? You are welcome to join and ask further questions.

(more on page 28, Registration required)

(Lecture hall)	Panel Discussion of the GBM Young Investiga- tors - "From Science to Business - Challenges and opportunities" (Chairs: J. Lassak & K. Rabe)
12:00 - 13:30	Guests: Luitpold Fried /Bind-X GmbH Dario Neri /ETH Zurich & Philochem AG Katharina Severin /High-Tech Gründerfonds Pablo Umana, Roche Glycart AG

(Registration required)

13:00 - 13:45 (Tenne)

Career Opportunities for Graduates in Bio-Pharma Cluster South Germany - a Worldwide Leading Hub for Process Development and Supplies of Biopharmaceuticals

**Uwe Buecheler** /Chairman of Biopharma Cluster South Germany

(Registration required)

14:30	
Т	
13:00	

Poster session I (even numbers)

(more on page 30)

# Thu., March 23



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Session 1 (continued /14:30 - 16:45) Next generation antibody-based immunotherapies (Novel concepts: Application in the clinic) (Chair: D. Ambrosius)

- Pablo Umaña /Zurich [CH] 4:30
- Enhancing endogenous and synthetic immunity with engineered antibody-fusion proteins for cancer immunotherapy
- Dario Neri /Zurich [CH]
- 15:00 Novel developments on immunocytokines

Coffee break (15:30 - 16:00)

- Paul Adam /Wien [AT]
- T cell engaging cancer immunotherapies
- 6:30 16:00 Early career investigator talk 3
- Meike Bröckelmann /Leipzig [DE] Investigating the T cell repertoire in melanoma immune checkpoint inhibitor therapy patients and their response to therapy
- 16:45 17:00 **Bayer Pharmaceuticals PhD Prize** 
  - (Chair: C. Seidel)
  - Inga Hochheiser /Bonn [DE]
  - Conformational transitions in NLRP3 inflammasome formation
- 17:00 17:15 Karl Lohmann PhD Prize
  - (Chair: C. Seidel)
- Johannes Morstein /San Francisco [USA]
  - Development and Application of Photoswitchable Lipids

# **Urno**r Thu., March 23



Erika Pearce

#### 17:15 GBM General Meeting (17:15 - 19:30) (for GBM members only)

- 9:30 Feodor Lynen Lecture
  - (Laudatio: B. Schwappach-Pignataro)

Erika Pearce /Baltimore [USA]



Regulated Changes in Lipid Metabolism that Impact T cell Function

The German Society for Biochemistry and Molecular Biology honors Erika Pearce with the distinguished Feodor Lynen medal for her outstanding achievements in cell biology and immunology

After the prize lecture the GBM invites all participants to join the Lynen reception.

The Lynen Lecture is sponsored by



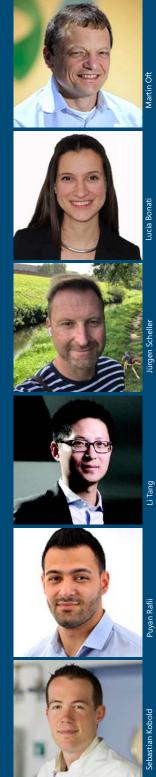
20:30

22:00

Lynen reception & poster session II (even & odd numbers)

**GBM** networking event





	Session 2 (09:00 - 12:00) Engineering cytokines and their receptors (Chair: M. Feige)
00:60	Martin Oft /Menlo Park [USA] Engineering IL-2 to increase anti-tumor efficacy and mitigate capillary leak
06:30	Early career investigator talk 4 Lucia Bonati /Lausanne [CH] Leveraging chemically-controlled protein switches for increased safety of cytokine-based cancer immunotherapeutics
09:45	Jürgen Scheller /Düsseldorf [DE] Synthetic cytokine signaling
	Coffee break (10:15 - 10:45)
10:45	Li Tang /Lausanne [CH] Metabolic reprogramming of exhausted T cells by IL-10 enhances anti-cancer immunity
11:15	Early career investigator talk 5 <b>Puyan Rafii</b> /Düsseldorf [DE] Engineering of synthetic cytokine chimeras (cytokimeras)
11:30	<b>Sebastian Kobold</b> /Munich [DE] Arming T cells with chemokine receptors for cancer therapy

Lunch break (12:00 - 13:00)

# Fri., March 24

12:00 - 12:45 (Darre)

12:00 - 13:00 (Schalander)

#### Industrial Lunch Session Promega /Walldorf [DE]

#### Erik Bonke

Bioluminescent Reporter Assays – Applications for the Development of Cell- & Antibody-based Immunotherapies

(Registration required, Lunch provided)

#### Meet the Prof with Matthias Mann

(Chair: Ch. Sand)

In an informal atmosphere you will get the chance to ask the questions that keep you up at night - e.g. how do I make a career in science? Did the speaker have fun on his/her scientific path and which experiences were decisive? You are welcome to join and ask further questions.

(more on page 28, Registration required)

#### Lunch Symposium Climate meets Biochemistry

(Chairs: G. Reiser & R. Heumann)

12:15-12:20 Welcome

12:20-12:50

Wolfgang Eberhardt /Berlin [DE] Designing the Energy System of the Future; a Roadmap to fight Climate Change and eliminate Pollution

12:50-13:20 Kirstin Gutekunst /Kassel [DE] Photosynthetic hydrogen production

13:20-13:45 Discussion and Q&A session for the audience

 Poster session III (odd numbers)

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#### Meet the Industrial Scientist with Dario Neri

(Chair: M. Schübel)

What are the differences between industrial and university research? How do the ways of thinking, approaches and focal points differ? Other topics include publications, patents, job security and career opportunities in a pharmaceutical environment compared to universities.

(more on page 28, Registration required)





David Baker

Session 3 (14:30 - 16:45)
Cell and virus-based therapeutical develop-
ments (Experiences and recent developments
with CAR-T cells in the clinic)
(Chair: D. Busch)

- Carl June /Philadelphia [USA]
- CAR-T cells for therapy
- Stan Riddell /Seattle [USA]
- 15:30 15:00 14:30 Novel developments in T cell engineering
- Early career investigator talk 6
- Volker Morath /Munich [DE]
  - Seeing is believing: Imaging of cell and gene therapies using a novel PET reporter gene system
- 15:45 Marion Subklewe /Munich [DE]
  - RWE CD19 CART: Efficacy, Safety & Next Steps

Coffee break (16:15 - 16:45)

on computational protein structure prediction and design with the

**Eduard Buchner Prize** (Laudatio: M. Feige)



David Baker /Seattle [USA] Protein design using deep learning

This year the GBM and Springer will honor Da-16:45 - 17:45

vid Baker from the University of Washington in

Seattle for his fundamental and pioneering work







Otto Warburg Medal

#### Otto Warburg Lecture & Medal

(Laudatio: A. Sickmann)

17:45 - 18:45 Matthias Mann / Martinsried [DE] Investigating metabolic switches in cancer in situ with single cell tissue proteomics

> This year the GBM, Elsevier and Biochimica et Biophysica Acta (BBA) will honor Matthias Mann from the Max Planck Institute of Biochemistry in Martinsried/Munich for his outstanding findings in the field of mass spectrometrybased proteome analysis with the Otto Warburg Medal.

> The highest award in Germany for biochemists and molecular biologists promotes outstanding scientific excellence and encourages groundbreaking achievements in the field of fundamental biochemical and molecular biological research.

Since 1963 the Otto Warburg Medal is intended to commemorate the outstanding achievements of Otto Heinrich Warburg. Elsevier and its flagship title Biochimica et Biophysica Acta (BBA) are exclusive sponsors of the Medal. To emphasize the importance of excellent scientific research and motivate young researchers to

achieve outstanding results, the prize is endowed with 25.000 Euro.







Mini Symposium
on Protein Engineering (09:00 - 10:00)
(Chairs: S. Zielonka & B. Höcker)

- Introduction of the GBM Study Group "Protein 09:10 09:00 Engineering & Design"
- Mitchell Evers /Utrecht [NL]
- Engineering IgA for cancer therapy with neutrophils
- 09:35 Clara Schoeder /Leipzig [DE] Novel immunotherapeutic drugs through computational protein design

Coffee break (10:00 - 10:30)

Session 3 (continued, 10:30 - 12:15) Cell and virus-based therapeutical developments (Advanced lymphocyte and virus engineering technologies) (Chair: D. Busch)

- 11:30 11:00 10:30 Alessia Potenza /Milan [IT] Recent developments in genetic engineering of T cells
- Yvonne Chen /Los Angeles [USA]
- Synthetic biology in cell therapy engineering
- Early career investigator talk 7
- Elvira D'Ippolito /Munich [DE] Fast identification of clincally relevant T cell
  - receptors for adoptive T cell therapy
- 11:45 Andreas Plückthun /Zurich [CH]
- Making a tumor produce highly potent drugs



Junior GBM Session (12:15 - 12:45) (Chair: N. Bopp)



12:45

**Gregor Fuhrmann** /Erlangen [DE] Antibiotic resistance - challenge and new therapeutic perspectives

Poster prizes & Closing remarks

# Mosbacher Kolloquium

"The Microbiome - from Understanding to Modulation"

March 21 - 23, 2024

Organisation: Jörg Vogel /Würzburg Ruth Ley /Tübingen Nassos Typas /Heidelberg

28



Jario Neri



<u> Matt</u>hias Mann



Erika Pearce

# Meet the Prof

This year's guests of our Junior GBM are Erika Pearce and Matthias Mann.

The scientists will give insights into their lives as researchers and their personal careers.

In addition, you can ask questions in an informal atmosphere that may help you with your personal orientation in research and career or that simply interest you.

Thursday, March 23, 12:00 - 13:00 (Schalander) (Chairs: Svenja Stelzig & Hannah Schiller) Erika Pearce /John Hopkins University, Baltimore [USA]

Friday, March 24, 12:00 - 13:00 (Room: Schalander) (Chair: Christopher Sand) Matthias Mann /Max Planck Institute of Bioche-

mistry, Martinsried [DE]

The number of participants is limited. A registration is required.

# Meet the Industrial Scientist

The Junior GBM was able to win Dario Neri from the ETH Zurich & Philochem AG for the "Meet the Industrial Scientist".

Similar to the "Meet the Prof" format, the scientist will talk about his work and career and answer your questions.

Friday, April 1, 13:15 - 14:15 (Room: Schalander) (Chair: Marisa Schübel) Dario Neri /ETH Zurich & Philochem AG, Otelfingen [CH]

The number of participants is limited. A registration is required.

Session Times Thurday, 13:00 - 14:30 (even numbers) Thurday, 20:30 - 22:00 (all numbers) Friday, 13:00 - 14:30 (odd numbers)

During the poster sessions the presenting authors are requested to stay near their posters. Posters should be presented throughout the whole meeting.

# Poster Specifications

The posters should be presented in portrait format (DIN A0 resp.  $\sim$  120 x 85 cm).

# **Poster Abstracts**

All poster abstracts are available as pdf-file for download on the meeting homepage.

A printed abstract booklet is available for viewing purposes at the registration desk.

# **Poster Numbers**

Please see the poster list on page 38 for poster numbers.

# **Poster Prizes**

The winners will be announced at the end of the meeting on Saturday. To receive the price, personal attendance is required.

The best three posters will be awarded (with certificate and  $300 \in each$ ).

Three poster prizes will be awarded by the Junior GBM. The winners will each receive a book voucher of 150 Euro from ChemBioChem/Wiley-VCH.

< D for GBM stakeholders





March 22	17:00 - 19:00	(Room: Malzboden)	
Marc	Sitzung: Sprecher der GBM-Studiengruppen		
ch 23	12:30 - 14:00	(Room: Malzboden)	
Marc	Sitzung: GBM-Kontaktpersonen		
:h 23	13:45 - 14:30	(Room: Schalander)	
March 23   March 23   March 23	Sitzung: Junior-GBM Stadt- und Bundessprecher		
h 23	17:15 - 19:30	(Lecture hall)	
Marc	GBM-Mitgliederversammlu	ng	

124	19:00 - 20:30	(Lecture hall)
March	Junor-GBM Mitgliederversamml	ung

# **Conference** Office

Opening hours are

Wednesday:	
Thurday:	
Friday:	
Saturday:	
Saturday:	

6:00	19:30
00:8	17:00
8:30	16:00
8:45	11:00

Phone:

+49 6261 9292 78



Ite Mälzerei

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### Internet

There will be a wireless LAN access point in the conference centre.

SSID: GBM Key: gbm-online

# Lunch & Coffee Breaks

Coffee, tea and mineral water will be provided for free during the coffee breaks.

Lunch and Dinner is available at your own expense in the conference center or in one of the restaurants in the city of Mosbach.

# Proceedings

Your name badge and the program booklet are available at the registration desk.

We kindly ask to wear your name badge as an entry ticket during the whole meeting.

We do not provide an abstract book. Please download the abstract pdf shortly before the meeting.

### Venue

The Kolloquium takes place in the "Alte Mälzerei" in Mosbach/Baden (Germany)

Alte Mälzerei Alte Bergsteige 7 74821 Mosbach/Baden



### ii) Hotel "Zum Amtsstüble"



In des

# Please visit our supporters

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Main Sponsor



# We thank for the kind support by:



Aichane, Khadija Engineering of the immunomodulatory adenovirus protein E3/49K

## C 04

Aschenbrenner, Isabel Rational engineering of a folding pathway changes mechanism and chaperone dependency of interleukin secretion

# O 03

Ayyıldız, Merve Computational design of specific binding pockets for phosphorylated amino acids within Armadillo repeat proteins

# C 02

Baumgärtner, Lynn Forced-dimerization of cytokine receptors using the transmembrane domain of constitutively active IL-7R

# I 17

Behnke, Julia Preclinical Validation of alphaSEPT, an engineered human Cytokine, as a Next-Generation Immunotherapy

# C 06

Bonati, Lucia Leveraging chemically-controlled protein switches for increased safety of cytokine-based cancer immunotherapeutics

O 18 Brandt, Helena The S-palmitoylation switch in activated T cells

## 120

Bröckelmann, Meike

Investigating The T Cell Repertoire In Melanoma Immune Checkpoint Inhibitor Therapy Patients and Their Response To Therapy

# C 05

Cruz, Patricia Rodrigues Engineering of synthetic cytokine chimeras (cytokimeras)

### T 06

D'Ippolito, Elvira Fast identification of clincally relevant T cell receptors for adoptive T cell therapy

### 1 02

Dombrowsky, Carolin

A modular approach for intracellular protein delivery via a cell- penetrating antibody

### C 01

Ettich, Julia Respiratory syncytial virus (RSV)-approved monoclonal antibody Palivizumab as ligand for anti-idiotype nanobody-based synthetic cytokine receptors

### O 02

Felker, Arthur Nanoscale signaling platform for spatiotemporal control of receptor tyrosine kinase activity in live cells

# I 13

Frecot, Desiree I. Human OX40 targeting Nanobodies for diagnostic imaging

# T 05

Freitag, Patrick C.

Targeted adenovirus-mediated transduction of human

### T cells in vitro and in vivo

### O 20

Friedrich, Karl-Heinz Tracing early stage cancers by detection of specific antigens in blood monocytes using novel antibodies

### T 04

Fritschle, Katja Image guided cell therapy: How PET-imaging can improve CAR-T treatments

# I 15

Gajewski, Jana Multiplexed autoantibody profiling to identify markers for clinical outcome of Immune Checkpoint Inhibitors in metastatic Urothelial Carcinoma patients

l 09 Grininger, Martin Dodecin is a carrier protein for immunizations

### I 01

Harwardt, Julia A generic strategy to generate trifunctional two-in-one antibodies by chicken immunization

### 116

Hasecke, Filip

PACMAN - Proteolytic Antigen Cleavage Mediated AmplificatioN: Introducing a novel class of proteolytic immunotherapeutics to tackle amyloid diseases

### I 06

Hochheiser, Inga Cryo-EM structure of the NLRP3 decamer bound to the cytokine release inhibitor CRID3

## I 10

Horns, Johanna Maria The impact of Blinatumomab treatment on immune cell dynamics in children and adolescents with BCP-ALL

### O 04

Humberg, Christoph Cysteine-less split inteins for the engineering of functionalized nanobodies

### O 16

Hüsers, Franziska The interferon-inducible antiviral MxB GTPase promotes herpesvirus capsid disassembly and premature genome release in cells

### O 21

Jülke, Eva-Maria Uptake of peptides investigated on a model system of the nasal mucosa

### I 19

Kolmar, Leonie Droplet microfluidic antibody screening platform for functional antibodies at the single-cell level

### T 02

Kremer, Anastasia siRNA-mediated downregulation of WAPAL inhibits T cell proliferation upon allogeneic stimulus

# O 11

Kutsch, Miriam Boosting cell-autonomous immunity against antibiotic-resistant bacterial pathogens

# O 12

Kutsch, Miriam Novel cytosolic LPS sensors: GBPs break down bacte-

# rial membranes and activate the non-canonical inflammasome

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Laschinger, Melanie Preclinical Validation of alphaSEPT, an engineered human Cytokine, as a Next-Generation Immunotherapy

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Mateyka, Laura Gene expression signatures can predict SARS-CoV-2 T cell receptor functionality

# O 10

Mayer, Ivy Multiscale Origami Structures as Interfaces for Cells

# C 03

Minafra, Anna Rita Synthetic receptor platform to identify loss-offunction single nucleotide variants and designed mutants in the death receptor Fas/CD95

### O 08 Moench, Svenja Formulation of DNA Nanocomposites: Towards Functional Materials for Protein Expression

# T 07

Morath, Volker Seeing is believing: Imaging of cell and gene therapies using a novel PET reporter gene system

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Most, Victoria Computational engineering of stabilized VαVβ single chain TCRs

Münick, Philipp Designed Ankyrin Repeat Proteins as a tool to reactivate p53 in cancer

### 104

Nowotny, Boris Complementary antibody fragments (hemibodies) for effective targeting of breast cancer

### O 19

Ott, Felix Toward Reproducible Enzyme Modeling with Isothermal Titration Calorimetry

### 1 08

Pfitzer, Anne Do immunoglobulin M (IgM) antibodies represent a natural immune mechanism against amyloid diseases?

### O 13

Pollmann, Christoph Spatiotemporal dynamics of IL-17 family receptor complex formation

### C 05

Rafii, Puyan

Engineering of synthetic cytokine chimeras (cytokimeras)

### I 03

Ramm, Franziska Cell-free production of targeted toxins for future medical treatments

### O 15

Reuber, Emelie Ellen Synthetic Glycans as Vaccine Candidates and Diagnostic Tool for Candida Infections

Rosenstengel, Rebecca The influence of glycation on the expression of the bi-functional enzyme UDP-N-acetylglucosamine 2-epimerase/N-acetylmannosamine kinase (GNE)

### O 09

Ruggiero, Fernando Molecular and biochemical characterization of MHC class I non-covalent clusters at the plasma membrane of mammalian cells

### I 15

Rupieper, Elena Multiplexed autoantibody profiling to identify markers for clinical outcome of Immune Checkpoint Inhibitors in metastatic Urothelial Carcinoma patients

#### 114

Schlepckow, Kai Therapeutic Targeting of TREM2 - a Novel Approach for Treatment of Alzheimer's disease?

### 112

Schneider, Leonie Hapten-decorated DNA nanostructures decipher the distance-dependent antigen-binding of antibodies on the nanoscale

### | 11

Schoenfeld, Katrin Generation of IgM-directed antibodies for the treatment of B cell cancers

# T 01

Segarra-Visent, Xavier Chemical optimization of miR-146a mimic for the treatment of Graft versus Host disease

Springer, Sebastian Stable empty MHC class I proteins for Immunobiotechnology

### I 18

Stech, Marlitt Design and generation of antibody-drug conjugates using non-canonical amino acids

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Sušac, Lukas Structure of a fully assembled tumor-specific T cell receptor ligated by pMHC

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Reuber, Emelie Ellen Synthetic Glycans as Vaccine Candidates and Diagnostic Tool for Candida Infections

### O 16

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## Morath, Volker Seeing is believing: Imaging of cell and gene therapies using a novel PET reporter gene system

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