DK-MCD Virtual Guest Lecture Series (winter term 2020/21)

Metabolomics and Lipidomics 13./14.11.2020 7th Munich Metabolomics Meeting https://www.eventbrite.co.uk/e/120950248449	2 Units per day
Obesity **Jeffrey Friedman** (Rockefeller University, NY) The Causes of Obesity and the Discovery of Leptin (14 min) https://www.ibiology.org/human-disease/leptin/ **Stephen O'Rahilly** (Cambridge, UK): Obesity Genetics: Health Consequences of Being Fat The Causes of Obesity: Why Isn't everybody fat? (31 min) https://www.ibiology.org/human-disease/obesity/#part-1 Why Does Obesity Lead to Adverse Health Outcomes? (30 min) https://www.ibiology.org/human-disease/obesity/#part-2	2 Units
Adult Stem Cells and Organoids **Hans Clevers** (Utrecht, The Netherlands) Discovery and Characterization of Adult Stem Cells in the Gut (31 min) https://www.ibiology.org/development-and-stem-cells/organoids/#part-1 Generating Epithelial Organoids from Adult Tissue (21 min) https://www.ibiology.org/development-and-stem-cells/organoids/#part-2 Organoid Technology for Disease Modeling (32 min) https://www.ibiology.org/development-and-stem-cells/organoids/#part-3	2 Units
Target of Rapamycin (TOR) **Michael Hall** (Basel, Switzerland) The Story of TOR (Target of Rapamycin) (24 min) https://www.ibiology.org/cell-biology/target-rapamycin/ **David Sabatini (MIT, MA)** Introduction to mTOR and the Regulation of Growth (34 min) https://www.ibiology.org/cell-biology/mtor-regulation/#part-1 Regulation of mTORC1 by Nutrients (30 min) https://www.ibiology.org/cell-biology/mtor-regulation/#part-2	2 Units
Presentation skills **Susan McConnell** (Stanford, CA); **Michael Alley** (Penn State University, PE): Designing effective presentations (42 min) https://www.ibiology.org/professional-development/scientific-presentations/ Rethinking Scientific Presentations: The Assertion-Evidence Approach (25 min) https://www.ibiology.org/professional-development/power-point-slide-design/ Assertion-Evidence Slides for a Research Talk (27 min) https://www.ibiology.org/professional-development/power-point-slide-design/#part-2 Attaining Confidence in Your Scientific Presentations (20 min) https://www.ibiology.org/professional-development/power-point-slide-design/#part-3	2 Units
ÖGMBT Life Science Tuesday https://oegmbt.at/jahrestagung/life-science-tuesdays (registration required) 17.11.2020 Hesso Farhan (University of Oslo, Norway): Regulation of ER proteostasis by mechanobiology 12.01.2020 Jordan Turnbull (ViraTherapeutics, Austria): new biologics, novel analytical tools 09.02. 2020 Heike Walles Ovgu (Magdeburg, Germany): The application of tissue engineering in the development of medicinal products 23.02.2020 Oliver Stegle (DKFZ & European Molecular Biology Laboratory, Germany): Computational single-cell biology - from one to many cells	2 Units per day

Rules

- Only lectures from this list will be acknowledged.
- If we become aware of additional, suitable guest lectures, we will announce them by e-mail after approval by the program speakers.
- For each of these online lectures, the respective number of units as indicated in the list can be accredited.
- Please note that the units are accredited for the entire topic, not for each/an individual lecture therein, e.g. Obesity: all 3 lectures must be watched to gain 2 units.
- Attendance must be approved by signature of your PI in the attendance list for Journal Clubs and Guest lectures.
- At least 4 but not more than 8 units per attendance list can be covered by these virtual guest lectures. The remaining 22-26 units must be covered by Journal Clubs (4 units for attendance/6 units for the presentation per Journal Club session).
- When you have filled the attendance list with 30 units, send a scan to Karin. She will compare it with our list and forward it to the Office of Doctoral Studies if all is correct.

November 13, Day 1

	14:00 - 14:10	Welcome	K. Kleigrewe and M. Witting	
Session 1 Advances in metabolomics and lipidomics	14:10 - 14:40	Martin Giera	Leiden University Medical Center	Standardization of (pre-)clinical Lipidomics: The international Lipidyzer cross-lab study
	14:40 - 15:10	Laura Sanchez	University of Illinois at Chicago	Cheese rinds as a model to study the chemistry of complex microbial communities
	15:10 - 15:20	Olga Deda	Aristotle University of Thessaloniki	Correlation of clinical types of Coronary Artery Disease with patients' metabolic profile - The CorLipid study
	15:20 - 15:30	Mareike Schulz	University of Münster	Comparison of the metabolomes of pathogenic and non-pathogenic E. coli strains with focus on siderophores
Break	15:30 - 15:40			
Session 2 Advances in metabolomics and lipidomics	15:40 - 16:10	Benedikt Warth	Universität Wien	Exposomics as a new paradigm for investigating toxicants
	16:10 - 16:40	Roger Linigton	Simon Fraser University	The Natural Products Atlas: An Open Online Resource for Microbial Natural Products Discovery
	16:40 - 16:50	Jialing Huang	Helmholtz Zentrum München	Machine Learning Approaches Revealed Metabolic Signatures of Incident Chronic Kidney Disease in Persons With Pre-and Type 2 Diabetes
	16:50 - 17:00	Kristina Haslauer	Helmholtz Zentrum München	Data processing in untargeted NMR Metabolomics - challenges and new perspective
	17:00	Wrap Up and Closing with K. Kleigrewe and M. Witting		

November 14, Day 2

Session 1 - Introduction	13:50- 14:00	Jerzy Adamski, Markus Gerhard		Welcome
	14:00- 14:25	David Berry, Christopher Gerner	University of Vienna	Keynote Lecture: The potential of and success factors for integrating microbiomics and metabolomics
Session 2 – Metabolic disease	14:25- 14:50	Kenneth Dyar	Helmholtz Zentrum München	Atlas of Exercise Metabolism Reveals Time-Dependent Signatures of Metabolic Homeostasis
	15:50- 15:15	Amalia Gastaldelli	Italian National Research Council	Metabolic pathways in the pathophysiology and progression of Non-Alcoholic Fatty Liver Disease
	15:15- 15:40	Lars Ove Dragsted	University of Copenhagen	Markers of food and dietary intake, compliance and association with cardiometabolic health
	15:40- 16:05	David Andrew Patterson	The Pennsylvania State University	Changing our perspective of bile acid biology through metabolomics
Break	16:05- 16:20			
Session 3 - Short Talks	16:20- 16:25	Steffen Tiedt	Ludwig-Maximilians-Universität München	Circulating Metabolites Differentiate Acute Ischemic Stroke from Stroke Mimics
	16:25- 16:30	Alexander Karabatsiakis	University of Innsbruck	Metabolite fingerprinting in blood serum indicates a biochemical link between childhood maltreatment and posttraumatic stress disorder
	16:30- 16:35	Federica Murgia	University of Cagliari	Metabolomic characterization of patients affected by relapsing-remitting and primary progressive multiple sclerosis
	16:35- 16:40	Antonella Angiolillo	University of Molise	Potential blood biomarkers in Alzheimer's Disease - a case-control pilot study
	16:40- 16:45			Short Talks Q&A
Break	16:45- 17:00			
Session 4 - Metabolomics in Neuropsychiatric diseases	17:00- 17:25	Daniela Vogt-Weisenhorn	Helmholtz Zentrum München	Metabolic analysis of model systems of Parkinson´s Disease
	17:25- 17:50	Daniel Raftery	University of Washington Medicine	Developing metabolomic biomarkers of dietary intake for personalized health
	17:50- 18:15	Oliver Fiehn	UC Davis	Developing a new hypothesis on organelle dysfunction from plasma metabolomic data of ME/CFS patients
	18:15- 18:25	Jerzy Adamski, Markus Gerhard		Closing remarks

Obesity

Jeffrey Friedman (Rockefeller University, NY)

Jeff Friedman is a Professor at the Rockefeller University and an investigator of the Howard Hughes Medical Institute. His work on leptin and body weight regulation has been key for our understanding of how genetics control human obesity.

Obesity is a highly heritable medical condition, with 70-80% of variations in body weight explained by genetic factors. In the 1990s, Jeffrey Friedman and his colleagues were the first to demonstrate the genetic basis for obesity when they identified and cloned leptin, a hormone secreted by fat tissue, as the responsible factor for maintaining normal body weight. Friedman's research has played a major role in our understanding of human obesity and the hormonal pathway that controls food intake.

The Causes of Obesity and the Discovery of Leptin (14 min)

https://www.ibiology.org/human-disease/leptin/

Stephen O'Rahilly (University of Cambridge, UK)

Dr. Stephen O'Rahilly is a professor of Clinical Biochemistry and Medicine and Head of the Department of Clinical Biochemistry at the University of Cambridge where he also directs the MRC Metabolic Diseases Unit in the Wellcome-MRC Institute of Metabolic Science. O'Rahilly is known for his work in identifying novel extreme human metabolic phenotypes, and identifying genes important in metabolic function and dysfunction.

Dr. Stephen O'Rahilly provides a biomedical perspective of obesity, and evaluates which genes could potentially shift the balance towards obesity.

The Causes of Obesity: Why Isn't everybody fat? (31 min)

https://www.ibiology.org/human-disease/obesity/#part-1

Why Does Obesity Lead to Adverse Health Outcomes? (30 min)

https://www.ibiology.org/human-disease/obesity/#part-2

Adult Stem Cells and Organoids

Hans Clevers (University Medical Center Utrecht, The Netherlands)

Dr. Hans Clevers provides a historical perspective on the discovery of adult stem cells in the gut, and explains how his lab developed a technique to grow from a single stem cell an organoid or mini-organ, a structure that recapitulates the normal structure of the gut.

Part 1: Discovery and Characterization of Adult Stem Cells in the Gut (31 min)

https://www.ibiology.org/development-and-stem-cells/organoids/#part-1

In his first talk, Dr. Hans Clevers provides a historical perspective on the discovery of adult stem cells in the gut. They identified a Wnt-dependent, rapid proliferating population of cells at the bottom of the crypt which seemed to be important for generating all epithelial cells in crypts and villi, and they hypothesized that these were gut stem cells. By using the Lgr5 gene as a marker, the Clevers' lab confirmed that these long-lived cells were indeed the gut stem cells by showing that they were able to generate all of the cell types of the gut epithelium throughout life. Clevers characterizes the gut stem cells and its progenitors, and explains how his lab developed a technique to grow from a single stem cell an organoid or mini-organ, a structure that recapitulates the normal structure of the gut.

Part 2: Generating Epithelial Organoids from Adult Tissue (21 min)

https://www.ibiology.org/development-and-stem-cells/organoids/#part-2

In his second talk, Clevers shows how one can apply what we have learned from developing gut organoids to generate mini-organs for other epithelial tissues, like liver and lung. Clevers shows that these organoids have a similar expression profile as well as structural characteristics to those observed in real tissue. In addition, he shows how this technique can be used to generate non-mammalian organoids, like the development of venom gland organoids from snake venom gland tissue. As Clevers explains, such organoids can be used to discover possible novel therapeutics, including new anti-venom serum.

Part 3: Organoid Technology for Disease Modeling (32 min)

https://www.ibiology.org/development-and-stem-cells/organoids/#part-3

In his third talk, Clevers describes how organoids can guide our understanding of disease progression in cancer. In addition, using Cystic Fibrosis and cancer as examples, Clevers shows how organoids can be used to predict therapeutic outcome in patients.

Target of Rapamycin (TOR)

Michael Hall (University of Basel, Switzerland)

Dr. Michael Hall joined the Biozentrum of the University of Basel in 1987 where he is currently a Professor of Biochemistry.

Michael Hall describes the discovery of TOR (Target of Rapamycin) protein, the key controller of the size of both individual cells and entire organisms. Hall's lab continues to study TOR and its role in growth, metabolism and disease.

TOR is now known to be a central controller of cell, tissue and organism growth and an important molecule in many human diseases including cancer, cardiac hypertrophy, diabetes and obesity. Michael Hall explains how the fortuitous decision, in 1991, to investigate the action of rapamycin in yeast led to the discovery of TOR.

The Story of TOR (Target of Rapamycin) (24 min)

https://www.ibiology.org/cell-biology/target-rapamycin/

David Sabatini (MIT, MA)

Dr. David M. Sabatini is a professor of Biology at the MIT and an investigator of the Howard Hughes Medical Institute. His lab is interested in the regulation of growth and metabolism in mammals, with a focus on the critical mTOR pathway. Research from Sabatini's lab has led to a better understanding of the role of the mTOR pathway in diseases such as cancer and diabetes, as well as in aging.

The small molecule drug rapamycin was known to have anti-growth effects, but its intracellular target was not known. Sabatini explains how he purified and cloned TOR from rat brain and showed that it was a protein kinase. This protein was named mTOR in mammals and was shown to be homologous to the TOR proteins in yeast. Sabatini and others went on to show that mTOR is at the heart of two large protein complexes, mTORC1 and mTORC2, that sense upstream signals such as nutrient levels, hormones, and growth factors and direct downstream effectors to build or breakdown resources as needed for cell growth and proliferation.

Introduction to mTOR and the Regulation of Growth (34 min)

https://www.ibiology.org/cell-biology/mtor-regulation/#part-1

Regulation of mTORC1 by Nutrients (30 min)

https://www.ibiology.org/cell-biology/mtor-regulation/#part-2

Presentation Skills

Susan McConnell (Stanford, CA)

Susan McConnell is a University Fellow in Undergraduate Education, an appointment that recognizes faculty who have made an outstanding contribution to undergraduate education at Stanford.

From group meeting to lectures to job talks, scientists need to give clear, effective talks. McConnell presents a compelling list of reasons why you should take advantage of available resources to improve your oral presentation skills.

Designing effective presentations (47 min)

https://www.ibiology.org/professional-development/presentation-skills/

What is the best way to give scientific presentations that engage and inform your audience? Dr. McConnell gives helpful advice on preparing and presenting an effective scientific talk. She gives advice on choosing fonts, colors and slide styles. She also recommends ways to structure your talk so the audience stays awake and engaged.

https://www.ibiology.org/professional-development/scientific-presentations/

Michael Alley (Pennsylvania State University, PE)

Michael Alley is a teaching professor of Engineering Communication at Pennsylvania State University. He is the author of three popular textbooks: The Craft of Scientific Presentations (2013), The Craft of Editing (2000), and The Craft of Scientific Writing (2018).

Michael Alley has been teaching scientists and engineers how to design presentation slides and deliver effective scientific talks for over three decades. In this three-part lecture, you will learn (a) how to design your PowerPoint or Keynote slides, (b) how to organize your talk, and (c) how to confidently deliver your research seminar. This series will help trainees and research scientists alike improve their presentation skills.

Rethinking Scientific Presentations: The Assertion-Evidence Approach (25 min)

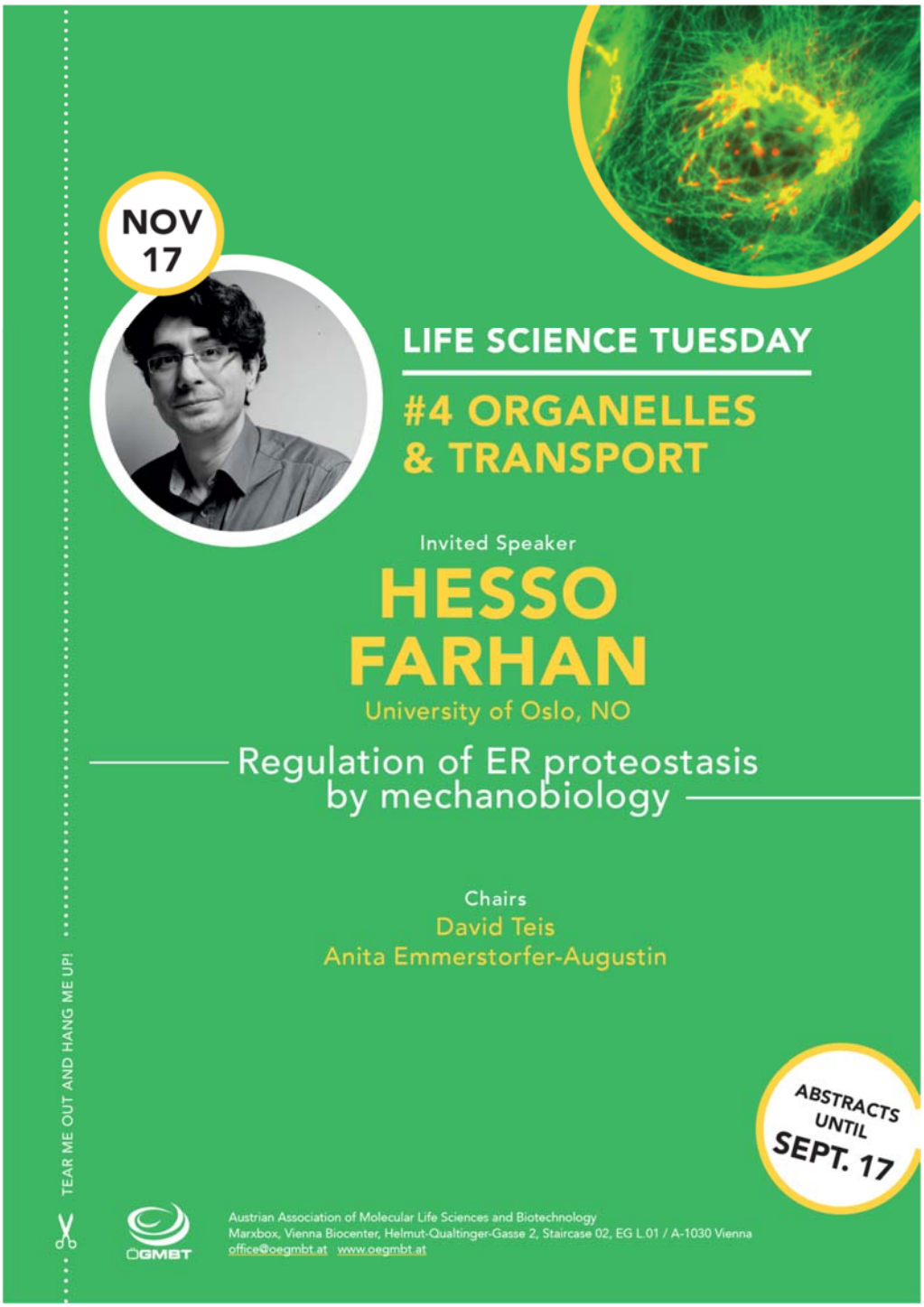
https://www.ibiology.org/professional-development/power-point-slide-design/

Assertion-Evidence Slides for a Research Talk (27 min)

https://www.ibiology.org/professional-development/power-point-slide-design/#part-2

Attaining Confidence in Your Scientific Presentations (20 min)

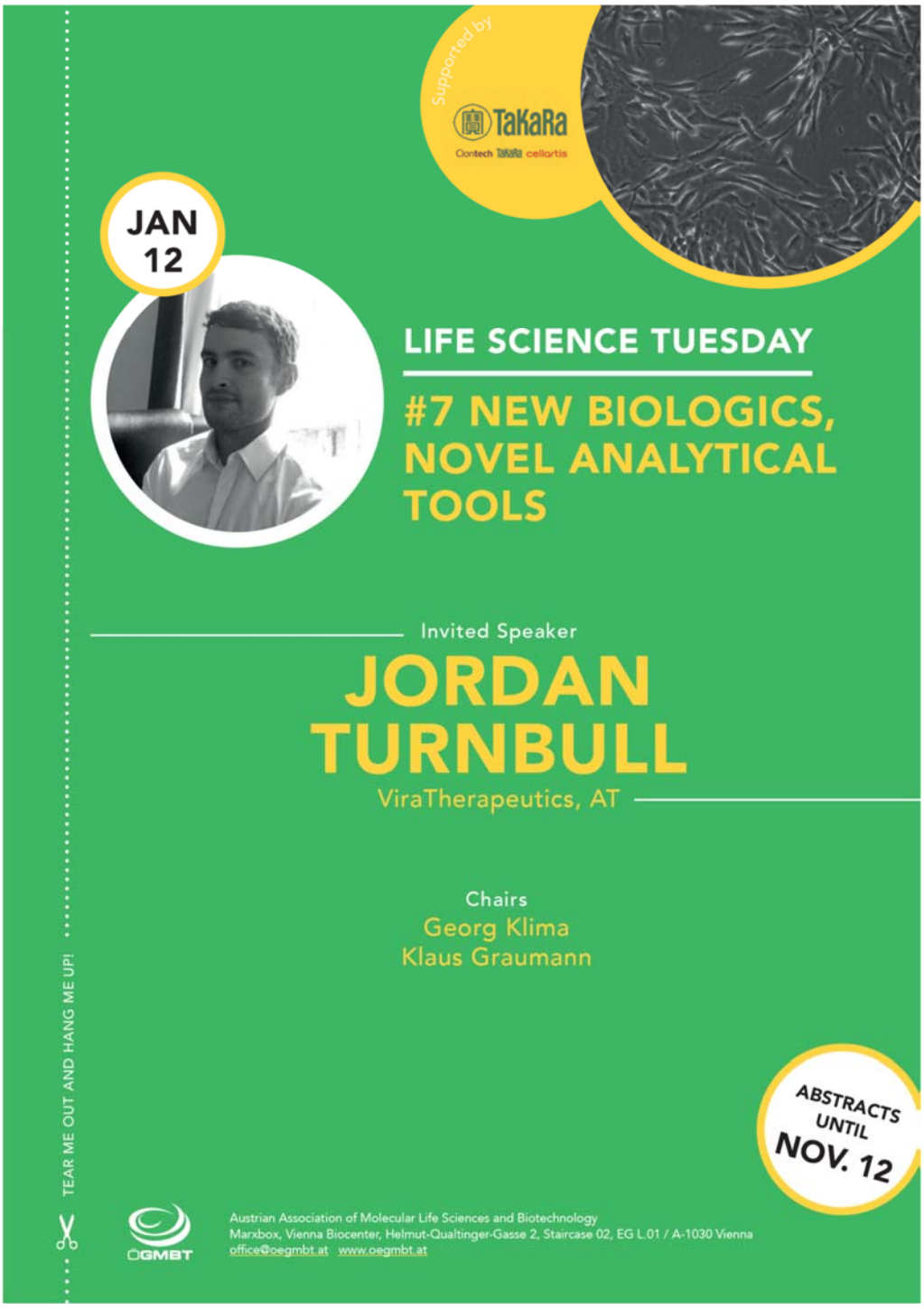
https://www.ibiology.org/professional-development/power-point-slide-design/#part-3



Life Science Tuesday #4/12: ORGANELLES & TRANSPORT

Hesso Farhan, University of Oslo, NO

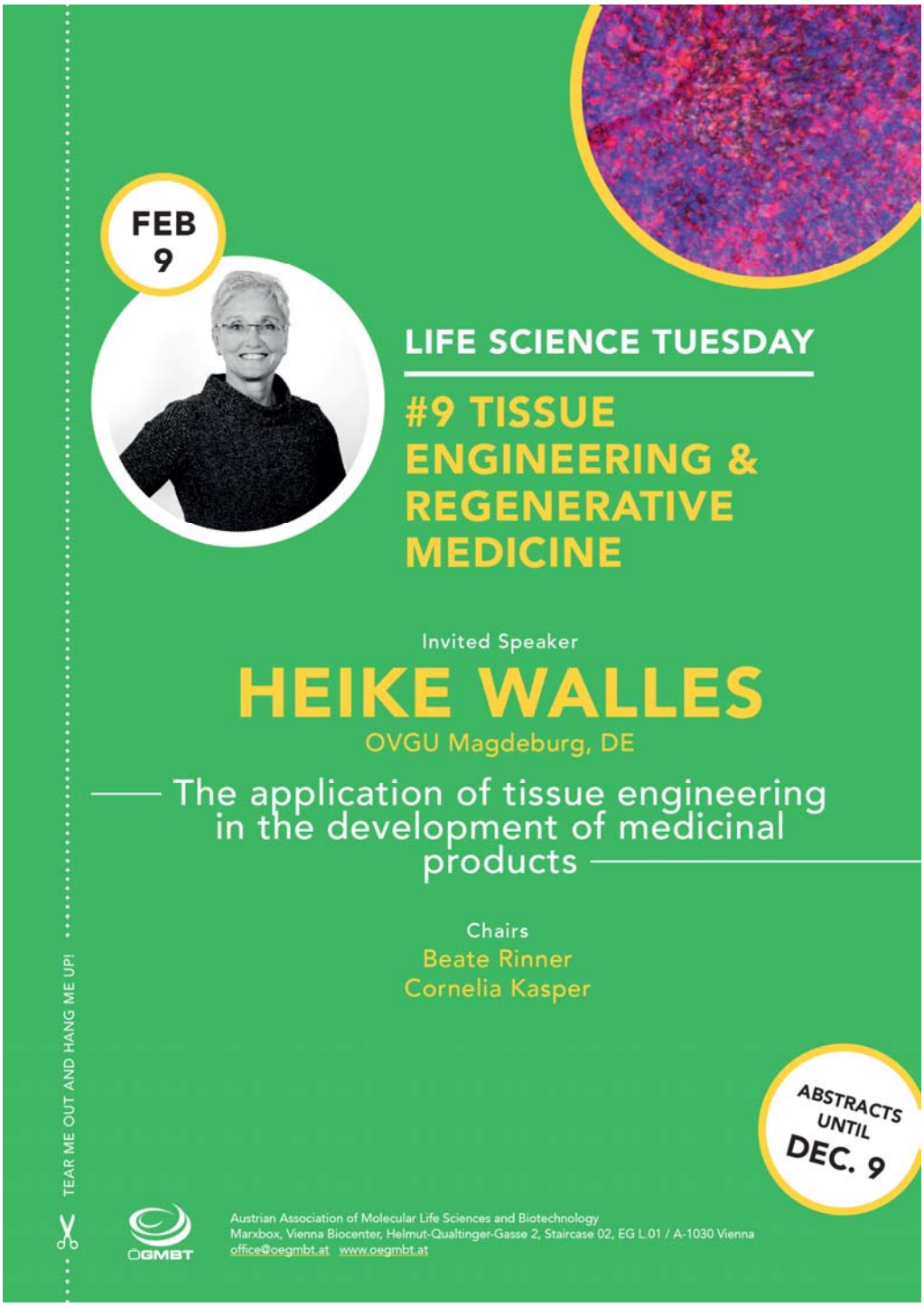
I am originally from Vienna, where I did my doctoral thesis. After a postdoctoral stay in the labs of Hans-Peter Hauri and Dirk Bumann in Basel (Switzerland), I started my junior group in 2011 at the Biotechnology Institute Thurgau at the University of Konstanz. In 2016, I accepted a professorship at the University of Oslo (Norway) and will by the end 2020 move to Innsbruck where I will be heading the Institute of Pathophysiology.



Life Science Tuesday #7/12: NEW BIOLOGICS, NOVEL ANALYTICAL TOOLS

Jordan Turnbull, Vira Therapeutics GmbH, AT

Jordan Turnbull studied Biomedicine at UCL (University College London) and proceeded there as Engeneering Doctoral Researcher for 5 years. His next career steps were as PostDoc in Ulm & Vienna, where he continued his work in Viral Vector Downstreaming Processing. Since Nov 2019 he is a principal scientist for Viratherapeutics, focussing on Oncolytic Viral Vector Downstreaming.

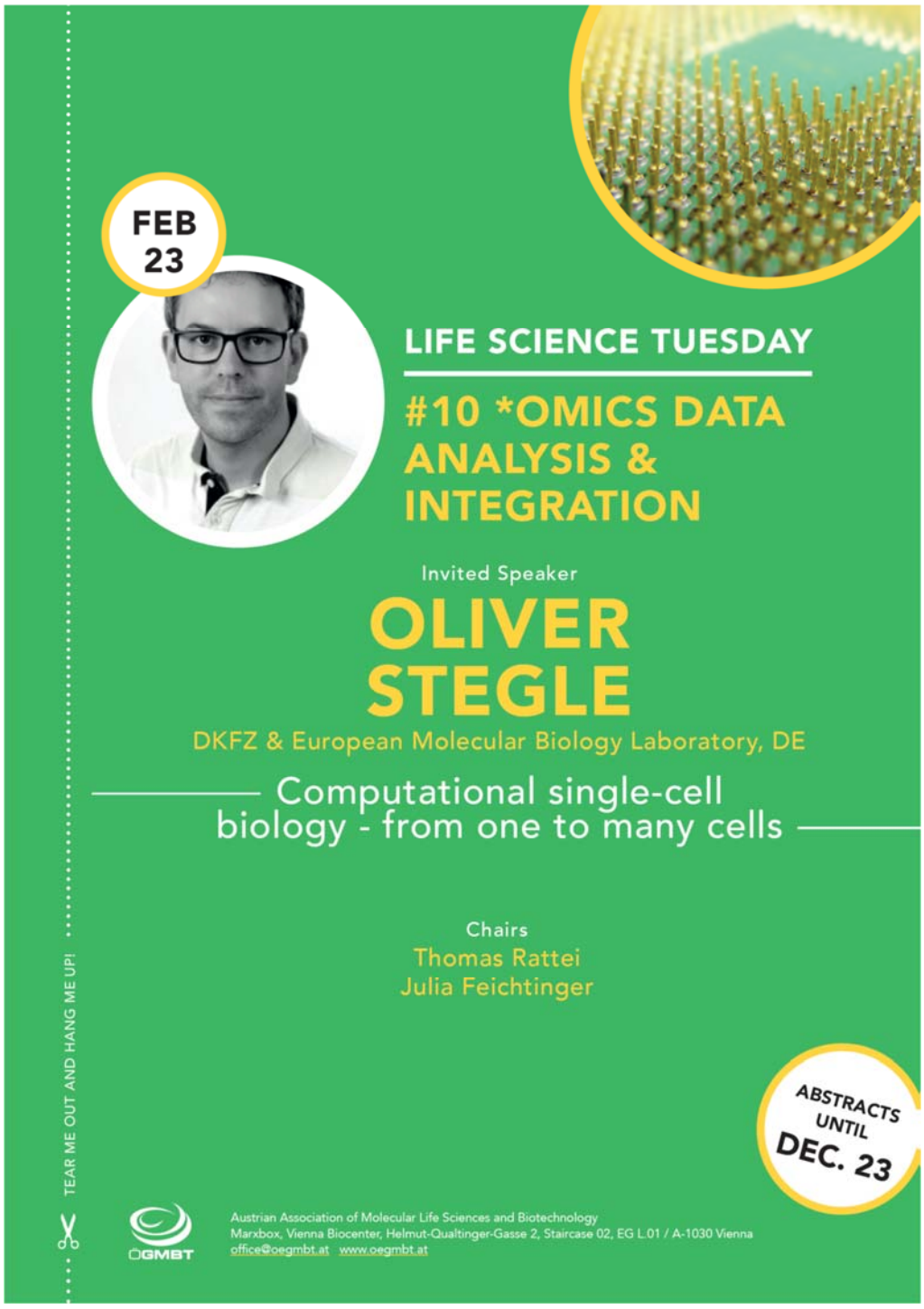


Life Science Tuesday #9/12: TISSUE ENGINEERING & REGENERATIVE MEDICINE

Heike Walles, Otto-von-Guericke-University Magdeburg (OvGU), DE

From 2014 to 2018, Prof. Dr. rer. biol hum. Heike Walles set up the Fraunhofer Translation Center “Regenerative Therapies” in Würzburg with a focus on 3D human tissue models for the preclinical development of pharmaceuticals.

This knowledge is now transferred to the new product class “medical devices". Therefore Prof. Heike Walles is establishing a Core Facility Tissue Engineering (CF TE) at Otto-von- Guericke- University (OVGU) Magdeburg since 2019. In this CF TE, the focus is the up scaling and standardization of human 3D tissue models for preclinical studies to CE-mark medicinal products according the new medical device regulation (MDR).



Life Science Tuesday #10/12: *OMICS DATA ANALYSIS AND INTEGRATION

Oliver Stegle, German Cancer Research Center, DE

Dr. Stegle earned his PhD from the University of Cambridge in Physics in 2009 and worked as postdoc at the Max Planck Institute for Intelligent Systems in Tübingen from 2009 to 2012. He has been a group leader at the EMBL European Bioinformatics Institute since 2012 before moving to Heidelberg in 2018 whre he heads a division at the German Cancer Research Center and is group leader at the European Molecular Biology Laboratory. He has received several recognitions, coordinates the ELLIS Health program and is an ERC investigator.