Vienna BioCenter

JANUARY - MARCH 2023

VBC NEWS

MICROBIOMES DRIVE PLANETARY HEALTH

FWF APPROVES CLUSTER OF EXCELLENCE WITH CEMESS LEAD

A research consortium led by Michael Wagner, deputy head of the Centre of Microbiology and Environmental Systems Science (CeMESS), located at Vienna BioCenter, has been successful in the “excellent=austria” programme of the Austrian Science Fund (FWF).

Under the title “Microbiomes Drive Planetary Health”, 30 principal investigators from seven Austrian research institutions are pooling their expertise to address the most fundamental questions in microbiome research.

In this Cluster of Excellence, 19 scientists from the University of Vienna are working together with researchers from the Austrian Institute of Technology (AIT), the Institute of Science and Technology Austria (ISTA), the Medical University of Graz, the Austrian Academy of Sciences with the Research Center for Molecular Medicine (CeMM), the TU Vienna, and the Johannes Kepler University Linz.

The aim of the consortium is to gain a functional and mechanistic understanding of environmental and host-associated microbiomes, in order to better identify the many services they provide and to more efficiently manipulate them for the benefit of planetary health.

Congratualtions to all involved on this great achievement!

Press release by FWF

Video about the CoE Research

Michael Wagner presenting the CoE

VIENNA BIOCENTER CAMPUS IN FIGURES

RESEARCH

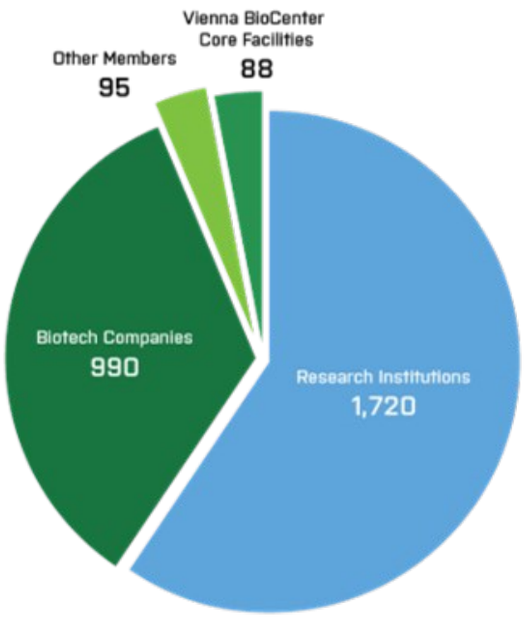
- 6 Research Institutions
- 145 Research Groups
- 2,269 scientists
- 9 Core Facilities
- 83 ERC Grants
- 33 EMBO members
- 13 Wittgenstein Awards
- 1 Breakthrough Prize

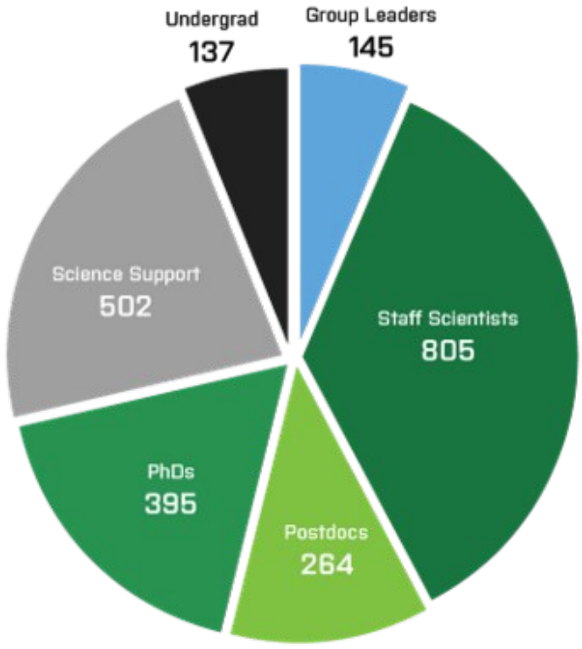
EDUCATION

- 5,100 Bachelor's and Master's Students
- Training Programmes:
  - PostDoc
  - PhD
  - Summer School
- Public engagement at Vienna Open Lab
- Childcare Center

BUSINESS

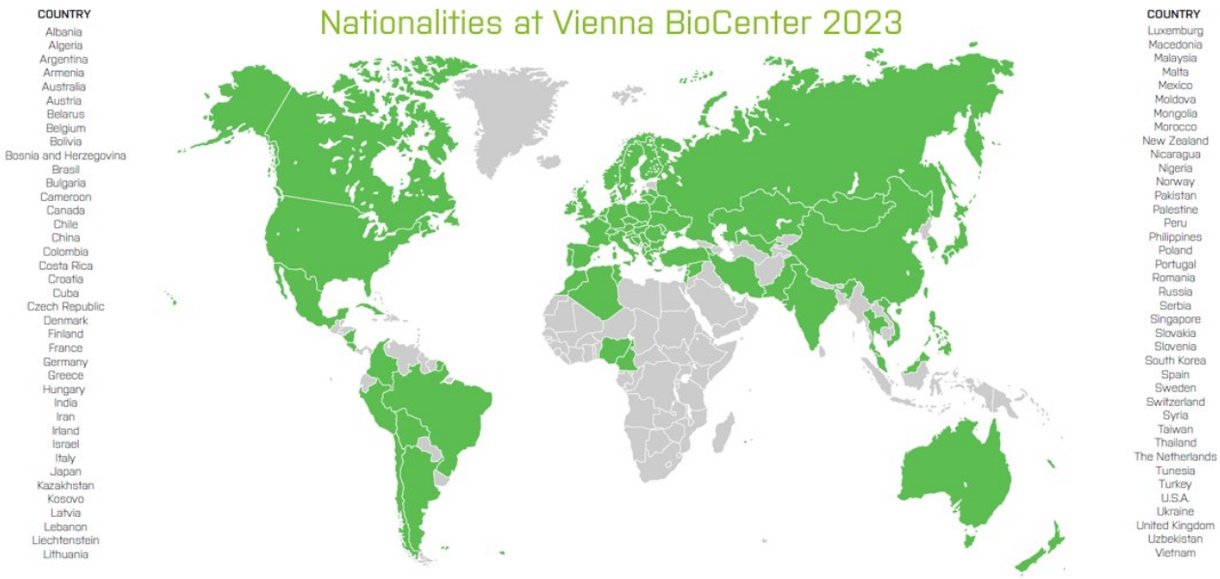
- 39 Biotech Companies:
  - Biologicals
  - Diagnostics
  - Drug discovery and development
  - Immunotherapy
  - Reagents
  - Vaccines
- 2 Business Incubators
- 4 Service Companies





2893 employees at different entities

2269 Scientists at Vienna BioCenter



SPORTS INITIATIVES ON VBC CAMPUS

VBC Sports is a campus-wide sports initiative to connect colleagues through their interest and passion for sports. All employees of VBC members have access to a wide range of sports activities through VBC sports.

To find out more, visit sports.vbc.ac.at and login via your institute. Employees at UBB follow these instructions and employees at VBC companies follow these instructions to register first with their work email address. Access to VBC Sports will be granted after successful approval of the registration.
Participation in VBC Sports activities is generously subsidized through membership fees of VBC association members. Thus, participation in most sports activities is free; however, some courses require partial or full coverage of the costs by the participants. This also applies to new courses during their trial phase to evaluate the general interest in such sports activities on campus.
Two such courses are presented below:

Outdoor Fitness @VBC
What? Functional training with your own bodyweight to improve your general fitness, back health, strength and mobility. All fitness levels welcome.
Dates: 18.04. - 20.06.2023
Location: VBC basketball court
Registration required until 14.04.2023
Prices: trial/ first participation: 10€, 1 training session: 19€, 7 sessions: 89€ (student 79€), 10 sessions: 119€ (student 99€)
More info: www.hybrid8.at

Freestyle Dance Workshop
What? FlexN, exploration of creativity and improvisation, play with imagination, groove, geometry, feelings and shapes. All levels welcome.
Dates: 18.04. - 13.06.2023, 6:30 - 8 PM
Location: on VBC campus (tbd)
Registration required until 14.04.2023
Prices: 90€ (or less, depending on final number of participants)
More info and registration: Daniel Braun

VBC SCIENTIFIC TRAINING

Vienna Area PhD Student Life Science Meeting hosted at VBC

In March, the students of the Vienna BioCenter PhD Program hosted the seasonal Vienna Life Science Meeting at the VBC, which brought together over 100 people from four research centers in Vienna (ISTA, CEMM, CCRI, and VBC). The event was designed as a networking opportunity and began with five rounds of "speed dating," during which students were randomly distributed to facilitate introductions.

The ice-breaking activity was accompanied by wine, cheese, and snacks. After the speed dating rounds, attendees had free time to get to know their new acquaintances better. The event then continued with five rounds of "PowerPoint Karaoke".

Successful Launch of Vienna BioCenter Leadership Program

Exciting news! March marked the start of the Vienna BioCenter Leadership Program!
Over the next year, a first cohort of participants from various leadership positions at IMBA, IMP, and GMI will embark on a journey to enhance their leadership skills and shape the institutes' work culture.

Leadership training is seldom provided as part of the academic track – Vienna BioCenter Scientific Training addresses this need, aiming to foster a sense of community and mentorship amongst campus leaders. A shout out to Eva Schmid, Head of Scientific Training and manager of this project!

RESEARCH INSTITUTES' NEWS

CeMESS

Women in Science 2023 @ CeMESS

For the International Day of Women and Girls in Science on February 11th and International Women's Day on March 8th, CeMESS has put the spotlight on women at the Centre. Just over half of the CeMESS staff and researchers are women. These women drive excellent research and provide the backbone of scientific work at the Centre.

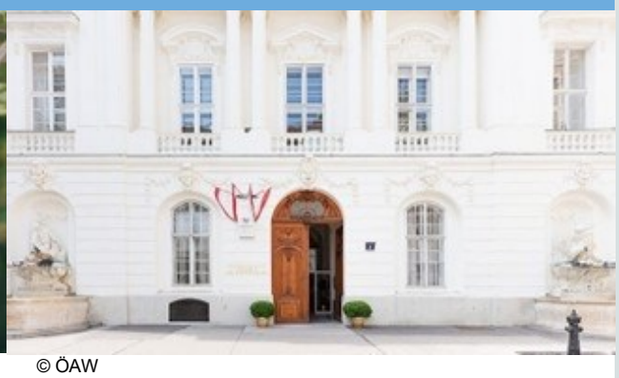
Nature paper refutes the existence of foetal microbiome

Scientific claims that babies already harbour living bacteria in the womb are incorrect. This has been proven by international researchers involving Thomas Rattei, head of the Division of Computational Systems Biology at CeMESS. With their study published in *Nature*, 46 experts clarify a scientific controversy that has a far-reaching influence on clinical medicine.

More CeMESS news

FACULTY OF LIFE SCIENCES @ UBB

Biodiversity researcher Franz Essl. © Petra Schiefer



© ÖAW

Franz Essl is Austria's Scientist of the Year

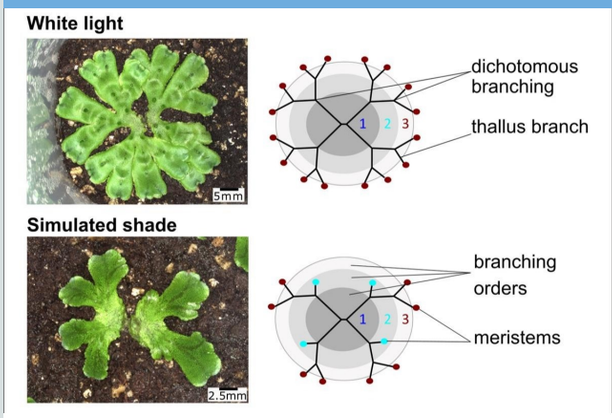
Biodiversity researcher Franz Essl from the Department of Botany and Biodiversity Research was elected Austria's Scientist of the Year 2022. The award primarily recognizes the ability of researchers to communicate scientific content in an understandable way.

Oleg Simakov was accepted into the Young Academy of the Austrian Academy of Sciences

Oleg Simakov (Department of Molecular Evolution and Development) has been accepted into the Young Academy of the Austrian Academy of Sciences (ÖAW). He is one of four scientists from the University of Vienna who were accepted at this year's election meeting of the ÖAW.

More Faculty of Life Sciences news

GMI



Bryophytes branch differently… also at the molecular level

Non-vascular bryophytes live in colonies that cover the ground and resemble tiny forests. In a real forest, plants compete for light in different layers of the canopy. If a plant does not receive enough sunlight, it stops lateral branching and instead grows vertically to reach the sunlight. Researchers from the Dolan lab at GMI discovered that the liverwort *Marchantia polymorpha*, whose plant body is fundamentally different from those of vascular plants, also adapts its architecture in response

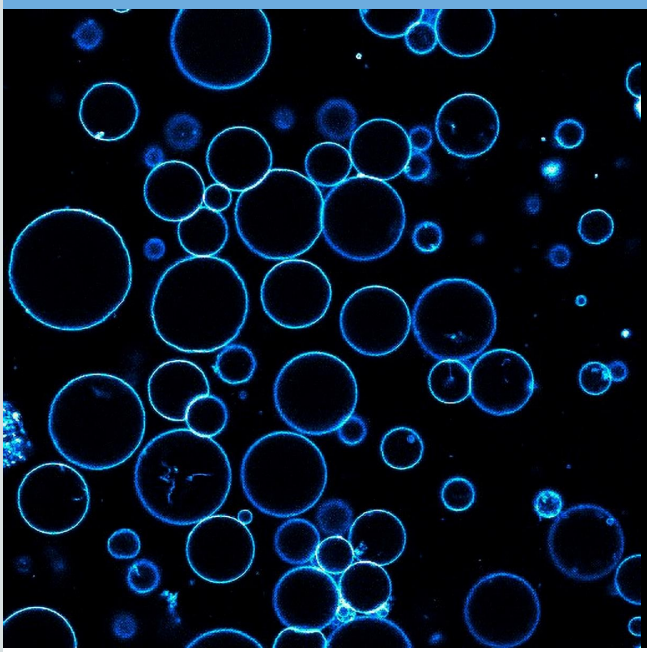
The dual face of photoreceptors during seed germination

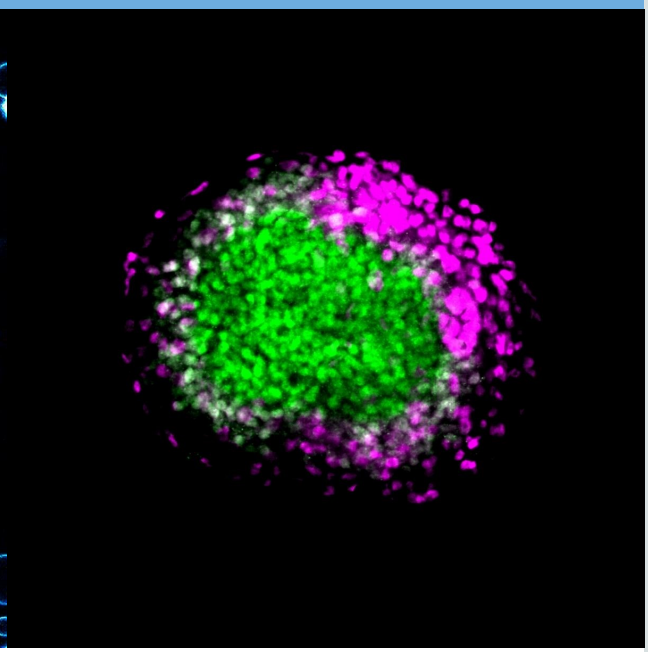
Seed germination depends on light in many plants. But not always: *Aethionema arabicum*, a plant adapted to challenging environmental conditions, does it its own way. Here, the phytochromes, the receptors for red and far-red light, play an unexpected role in seed germination and time this process to the optimal season. These findings by researchers from the Mittelsten Scheid lab at GMI, published on March 2 in *Plant Physiology*, are a compelling example of the evolutionary to shade. These new insights into the evolution of genetic pathways governing branching were published on January 24 in *Current Biology*.

rewiring of signaling modules that help plants adapt to their habitats.

More GMI news

IMBA





Muscle health depends on lipid synthesis

Muscle degeneration, the most prevalent cause of frailty in hereditary diseases and aging, could be caused by a deficiency in one key enzyme in a lipid biosynthesis pathway. Researchers from the Penninger lab at IMBA characterize how the enzyme PCYT2 affects muscle health in disease and aging in laboratory mouse models. The findings were published on March 20 in *Nature Metabolism*.

Weiss-Kruszka Syndrome and the failure to establish neuronal identity

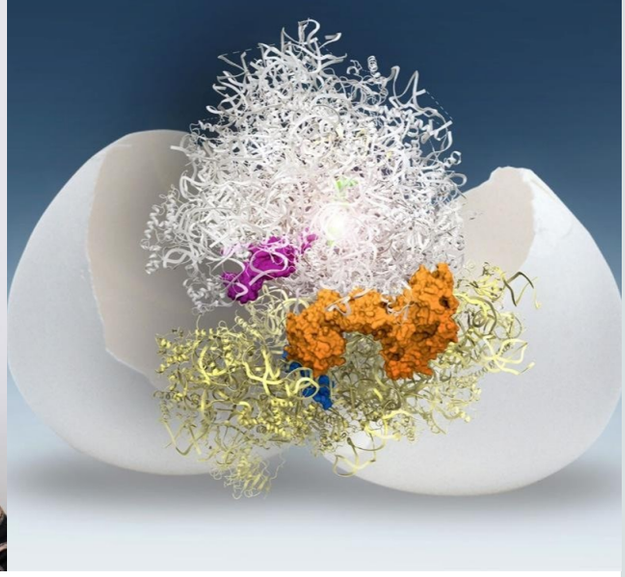
Weiss-Kruszka syndrome is a rare neurodevelopmental disorder characterized by craniofacial anomalies, developmental delay, and autistic features. Researchers from the Bell and Brennecke labs at IMBA and the Keck School of Medicine of the University of Southern California (USC) uncovered that the causative mutation in the gene ZNF462 leads to a failure to safeguard the neural lineage specification during early embryonic development. The study, conducted in disease-modeled murine cells, was published in *Nature Cell Biology*.

More IMBA News

IMP

ERC Advanced Grant for Elly Tanaka

Axolotls can regrow lost limbs with full functionality, which requires the correct interplay of different tissues such as muscles and nerves. Sometimes, however, regenerated limbs are not correctly wired, and the reasons for this are unclear. A new ERC Advanced Grant for IMP Senior Scientist Elly Tanaka will fund research into this phenomenon.

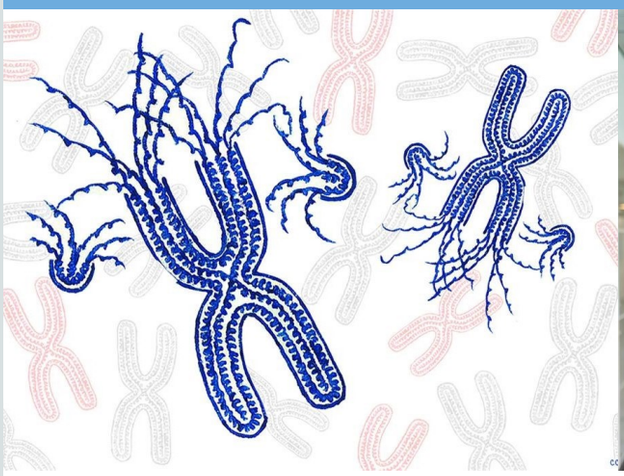


Bringing the ‘sleep mode’ of egg ribosomes to light

Ribosomes, the molecular machines that produce proteins, are deposited in large amounts in the egg, yet most of them remain inactive to preserve energy until fertilisation. Scientists across several labs at the IMP have discovered the molecular mechanism that keeps ribosomes dormant in fish and frog eggs and reported their findings in *Nature*.

More IMP news

MAX PERUTZ LABS



Aneuploidy patterns in cancer cells recapitulated

Most cancer types harbor specific patterns of chromosomal abnormalities, called aneuploidies, but why certain chromosomes are selected for gain or loss while others are not is poorly understood. In work published in *Genes*

New Marco Hein lab

Marco Hein recently established his lab at the Max Perutz Labs. In this interview he talks about the excitement of discovering something new and what we can learn from viruses about our cells and from viral pandemics about science.

& Development, the lab of Christopher Campbell has now managed to recapitulate some of the aneuploidy patterns seen in cancer cells in the lab. They were able to identify specific genes that are responsible for the selection of certain aneuploidies for the first time in human cells.

Marco obtained his PhD at the Max Planck Institute of Biochemistry (Germany). He later worked as an EMBO postdoctoral at the UC, San Francisco (USA), where he became interested in virus-host interactions. Before joining the Max Perutz Labs, he was a research fellow at the Chan Zuckerberg Biohub, San Francisco (USA) from 2020 to 2022.

More Max Perutz Labs News

VIENNA BIOCENTER CORE FACILITIES

COMPUTATIONAL BIOLOGY TRAINING

YEARLY REPORT 2022

2022 has been another very successful year for the VBCF Computational Biology Training. In total, 36 courses (+3%) with 400 attendees (+16%) were held compared to 2021. 354 attendees from VBC and 46 external attendees were trained. Participants' satisfaction score was very high, at 94%, consistently observable throughout the years. In 2023, advanced data analysis courses on generalized linear models and Bayesian statistics will be added to our portfolio to support the changing needs of VBC researchers. While the VBC remains our primary focus, we also plan to reach out to more non-VBC research institutions.
Overall, the VBCF Computational Biology Training is a mature service that positively impacts the VBC Campus and other collaborating institutions in Vienna.

NEXT GEN SEQUENCING

Nearly 20 years after the initial commercialization of the first Next Generation Sequencing system and 15 years after the setup of the first NGS platform at the VBC, NGS technology continues to evolve rapidly. The VBCF-NGS facility is committed to bringing these advances to the VBC and shaping them into high-quality, cost-efficient services. Below, we highlight some of the **current developments in the field** and their **current or planned implementation at the VBCF-NGS facility**.

NEW KIDS ON THE BLOCK

© Element Biosciences, PacBio, Ultima Genomics, Singular Genomics

Driven by the expiry of crucial Illumina patents, several novel NGS platforms were launched last year. The most prominent and promising ones are **Element's AVITI sequencer, PacBio's Onso, Ultima's UG 100, and Singular Genomics' G4** instrument (see image, top left to bottom right). The VBCF-NGS facility is currently evaluating these platforms and their potential for the campus.

THE EMPIRE STRIKES BACK

Illumina's dominance over the NGS market in the last ten years resulted from its ability to substantially reduce sequencing costs and increase output on each iteration of its sequencing instruments. Last year's launch of **Illumina's NovaSeq X** series is their latest accomplishment in this regard. Offering up to a 40% reduction in cost per gigabase, the NovaSeq X will enable projects which were, so far, cost prohibitive. The NovaSeq X represents the logical next step for the VBCF-NGS facility as a replacement for the currently applied NovaSeq 6000 and has been budgeted for the second half of 2023.

© Illumina

SIZE MATTERS!

Long-read sequencing has been elected this year's Nature's Method of the Year. With good reason! Long-read sequencing (PacBio, ONT) offers tremendous advantages for many applications. To name a few: Haplotyping genomes, analysis of alternative splicing, direct detection of base modifications, *de novo* sequencing, native/direct RNA sequencing, and many more!

The VBCF-NGS operates **ONT's MinIONs and a PromethION system** and has a well-established collaboration with the MPI-CBG Dresden, where we sequence PacBio libraries prepared at the VBCF-NGS facility on **PacBio Sequel IIe systems**. If you think your research might profit from longer reads, contact us and, we'll be happy to discuss your project.

FROM A DIFFERENT ANGLE

Optical mapping is a powerful technique that has revolutionized the analysis of

@ Bionano Genomics

DNA. It is a process that uses fluorescent dyes to visualize DNA sequences on a large scale, allowing researchers to map and study the structure and organization of the genome. Optical mapping has several advantages over other genome mapping techniques, making it a valuable tool for genomic research and a relevant complement to sequencing technologies.

The Saphyr system from Bionano Genomics is operational in the facility since Q1 2023. Mark your calendars for our upcoming **Bionano seminar on May 25**; details will be announced shortly. Also, watch out for the forthcoming announcement of optical mapping services at the VBCF-NGS!

ONE FOR ALL AND ALL FOR ONE

The number of requests for **single-cell sequencing** has steadily increased over the last year. Consequently, we have strengthened our single-cell / spatial transcriptomics team. Facility members **Thomas Grentzinger** and **Philipp Wolff** are now in charge of these two growing and evolving areas. Besides running the established 10X single-cell pipelines, they are currently evaluating alternatives to the 10X microfluidics approach (combinatorial barcoding, PIP-seq).

Thomas (left) and Philipp (right) are in charge of single-cell / spatial transcriptomics.

LOCALIZE IT!

Spatial transcriptomics adds a new dimension to RNA sequencing, enabling to map gene expression in tissues. In 2022, we established the **10X Visium spatial transcriptomics** workflow together with the VBCF Histology facility. This service is up and running; please contact the NGS or Histology facility to get started! In May, we have scheduled an on-site evaluation of a 10X CytAssist instrument, which promises enhanced results for fixed tissue sections and a more streamlined workflow.

ROBOTS!

Sample handling automation and robotic library preparation have been key development fields in the NGS facility in the last few years. Besides offering the highest precision and reproducibility, automation opens the door to the miniaturization of library preparation protocols. By combining a contact-free **nanoliter dispenser (Echo 525) with a 384-head liquid handling robot (Beckman Coulter i7)**, we successfully

downscaled three protocols (16S, smart-seq3, and xxx) to 384-well plate format, which will be launched as regular services from May on. Several more protocols will follow over the year.

PROTEOMICS

ORGANIZATIONAL CHANGES IN THE FACILITY

We are happy to share the following organizational changes in the Protein Chemistry facility to address future challenges in proteomics service provisions and keep up with the latest developments.

Elisabeth Roitinger will take over the position of Head of the Protein Chemistry Facility, now called the Proteomics Facility. She will ensure smooth facility operation and high-quality service provision by building on her expertise and many years of work experience.

Karl Mechtler will become Head of the newly created Proteomics Tech Hub, focusing on research and development in proteomics and serving as the anchor point of innovation in this field at the VBC. The Proteomics Tech Hub leverages synergistic effects by sharing lab space and instrumentation with the Proteomics facility. Karl's group is one of the pioneering groups in single-cell proteomics; thus, as one of their first projects, they will establish this ground-breaking methodology for proteomics analysis of single cells and low-input samples.

Both units will use VBCF's proteomics instrument park. VBCF was entrusted with facility operations, while the team members of both units remain employees of their respective institutes.

PRECLINICAL PHENOTYPING

NEW TEAM MEMBER

Since March, **Zita Bodog** reinforces pcPHENO's mouse in vivo testing and surgical services. Coming from the Medical University of Vienna's Brain Research Institute and the University of Szeged, she has several years of experience in rodent surgery and behaviour tests as well as optogenetics and *in vivo* electrophysiology.

Welcome Zita!

Follow VBCF on

VBC COMPANY NEWS

Webinar: AI-Powered AMR Detection and Surveillance to Inform Antibiotic Precision Therapy

Ares Genetics (OpGen) is hosting a webinar titled 'AI-Powered AMR Detection and Surveillance to Inform Antibiotic Precision Therapy' hosted by ARES CEO Dr Arne Materna. Antimicrobial resistant (AMR) infections are on the rise causing approximately 1.3M deaths each year due to patients succumbing to usually treatable infections which however no longer respond to antibiotic therapy. This presentation focuses on the impact and prevention of nosocomial pathogen transmissions causing healthcare associate infections (HAI) and the utilization of Whole Genome Sequencing. Click here to register.

CEBINA provides office and laboratory space for life science entrepreneurs and biotech companies

CEBINA is currently offering some additional office and lab space for rent to biotech companies interested in joining our innovation hub. Current availability is ca. 120m² of office space and up to 8 workstations in our fully equipped BSL2 laboratory. Contact us to know more or for planning a tour of our facility.

Office space for technology startups

INiTS is Vienna's High Tech Incubator and situated at the Vienna BioCenter. Since we know the important role of a community, we offer office space to technology startups who want to participate in the vibrant and inspiring life of a technology hub. Contact us for more information!

New invIOs Scientific Advisory Board

Top left to bottom right: Gottfried Baier, Thomas Bogenrieder, Thorsten Füreder, Anna Obenauf, Anton Stuetz

invIOs unveiled a Scientific Advisory Board (SAB) that brings together five leading Austrian cancer experts, including Dr. Anna Obenauf from the VBC community, to help fast-forward our development as we continue to discover and develop innovative cancer immunotherapies. The SAB is a multi-disciplinary formation with cross-cutting knowledge across some of the most advanced areas in cancer research and clinical development. All of the advisors already know the invIOs team well from many collaborations in the past.

Vienna BioCenter JLPHealth

JLP Health and partners discover treatment for glioblastoma

JLP Health, together with researchers from the Institute of Molecular Biotechnology of the Austrian Academy of Sciences (IMBA), the Medical University of Vienna (both Vienna, Austria), and the Novartis Institute for BioMedical Research (Basel, Switzerland), by investigating the molecular mechanisms of Artemisinin toxicity uncovered a novel combinatory treatment of Artemisinin and 5- ALA for glioblastoma that selectively kills brain cancer cells.

Vienna BioCenter LabConsulting Our global network for your success

Upcoming Events at the LabShop

LabShop-Lunch Seminar (May 3rd, 12 AM - 3 PM, Labshop, Erne-Seder-Gasse 4/2)
Learn about the latest Nucleic Acid Extraction Methods and Kits, More info here

Pipette calibration day June 20, 2023:
More info here or contact support@labshop-online.com or call +43 1 244 28 55.

Vienna BioCenter QUANTRO Therapeutics

New QUANTRO Therapeutics short film

Austria is a great R&D location for Life Sciences and QUANTRO Therapeutics appreciates every part of it. Recently we were honored to be allowed to participate in a short film produced by the Austrian Business Agency. It provides a concise insight into the Austrian Life Sciences sector in terms of companies, start-ups and locations. Watch the video here

Vienna BioCenter

valneva

Valneva presented on its Chikungunya Vaccine Candidate and Hosted a Roundtable at the 23rd World Vaccine Congress in Washington D.C.

Valneva SE presented on its single-shot chikungunya vaccine candidate, VLA1553, and host a roundtable on Zika vaccines next week at the 23rd World Vaccine Congress in Washington, D.C. A regulatory review process is underway with the U.S. Food and Drug Administration (FDA) for the company's single-shot chikungunya vaccine candidate. If approved, it could become the first vaccine in the world to address the unmet medical need of chikungunya.

Valneva published its 2022 Annual Business Report "Our ambitions for a changing world"

Valneva published its 2022 Annual Business Report, which is available here.

The US FDA Accepted Valneva's Chikungunya Vaccine License Application for Priority Review

Valneva SE announced that the U.S. Food and Drug Administration (FDA) has completed a filing review of its Biologics License Application for Valneva's single-shot chikungunya vaccine candidate VLA1553 and has determined that the application is sufficiently complete to permit a substantive review. The review classification is Priority. VLA1553 has been assigned a Prescription Drug User Fee Act (PDUFA) review goal date at the end of August 2023, which is the date by which the FDA intends to take action on the application.

Summer Science Camps for children and teenagers

The year 2023 started off with good news for the Vienna Open Lab. In the first three months, the hands-on laboratory at the VBC already welcomed over 3500 visitors. Now the team is getting ready for the summer holidays. As of now you can book the annual Summer Science Camps. Curious kids and teens from 10 to 20 years of age can expect five days full of experiments in molecular biology, chemistry and genetics. For children aged 8 and older the Vienna Open Lab offers a one-day summer program with exciting experiments.

EVENTS ON CAMPUS

IMBA's 20th anniversary

When an institute reaches a milestone anniversary, it presents an opportunity to commemorate its past achievements while also setting sights on future successes.
In June, IMBA will celebrate the start of its research journey 20 years ago with a variety of events that we encourage you to participate in. These activities fall under the overarching theme of "**Exploring the Unknown: Our Passion, Our Future**".
On **14 June**, we will host an all-day celebration with a scientific symposium, a networking event with IMBA alumni, and a salon featuring artists who have produced exceptional work at IMBA. We close the evening with a reception.
You can register for the jubilee events here.

EVENTS OFF CAMPUS

Rare Plant Fair in the Botanical Garden

To kick off the gardening season, the Rare Plant Fair invites plant lovers and garden enthusiasts to the Botanical Garden of the University of Vienna.
From **April 14 to 16**, visitors will be able to purchase unusual plant rarities for the garden, balcony and raised bed.
GMI will be participating in the Rare Plant Fair of the botanical garden with an information stand, presenting the diverse research of GMI. Come visit your colleagues and learn more about the fascinating world of botanical research!

Science Book of the Year Award Ceremony

© Brandstätter Verlag

The book **"Raben"** by **Thomas Bugnyar**, Head of the Department of Cognitive Biology, University of Vienna, was selected as the 2023 Science Book of the Year in the category Science/Technology.
Within the Science Book of the Year project, achievements in research in subject areas of public interest are highlighted and communicated.
The **award ceremony** will take place on **April 24, 2023** in the **Aula der Wissenschaften**. The award is presented by Martin Polaschek (Federal Minister for Education, Science and Research). Thomas Bugnyar will be a guest on the podium together with other authors. More info and registration here.

Kids' workshop in collaboration with the Botanical Garden on the Fascination of Plants Day on May 18th

GMI is partnering with the Botanical Garden for a kid's program as part of the **Fascination of Plants Day celebration on May 18th**. Sebastian Deiber and Johannes Rötzer from the Dolan Group, along with the Communications and Partnerships Team, will lead a fun-filled workshop for kids about seeds and plants. Children will even get to plant their own vegetable garden to take home with them! No registration is necessary - simply drop by in the afternoon and join in on the fun!

Health Innovation Summit Vienna

HEALTH HUB VIENNA in cooperation with ERSTE eit Health LISAvienna life science austria part of ViennaUP'23

On **June 6th**, Health Hub Vienna will organize the first Health Innovation Summit Vienna as part of the VieannaUP festival. The Summit is all about transforming the healthcare system through Innovation, Collaboration and Entrepreneurship. We are discussing the status of Digital Health in the center of Europe, showcasing best practices and international case studies and inviting European ecosystem players for deriving inspiration for the further development of the Digital Health ecosystem.

WORKING AT VBC

FOOD TRUCKS AT VBC

Five different food trucks expand the culinary offerings on VBC campus. You can choose from daily changing, varied options. Already found your favorite?
Food trucks stop at VBC Campus daily (Mon to Thu from 11 am to 2 pm) in front of the Globe Wien (at the corner of Karl-Farkas-Gasse and Maria-Jacobi-Gasse). The Wrap Stars food truck stops in front of the Marxbox.

Monday

PASTAHELD

Tuesday

Wednesday

WRAP STARS

Gabriel
einfach gut essen...

Thursday

Vietnam deli
STREET FOOD
authentic & homemade ... so delicious

Follow Vienna BioCenter on