UPCOMING EVENTS

Kinder unter sich – Peerbeziehungen im dynamischen sozialen Netzwerk einer Kindergruppe

- September 12th 2018, 18:00
- IMBA Lecture Hall

Dr. Lisa Horn-Péter (University of Vienna), the project leader, will present results of the pilot study implemented at VBC Child Care Center. The goal of the study was to investigate the factors influencing early social competence and socio-positive behaviour in the child-care setting.

Language: German

SAVE THE DATE!

EMPHASIS Plant Phenotyping Forum

- September 13th, 2018
- IMP Lecture Hall
- Deadline for registration (free of charge): September 7th, 2018

It is our pleasure to invite you to the Plant Phenotyping Forum discussing the role of Austria and Eastern Europe in plant phenotyping for sustainable agriculture.

The Forum will address the plant phenotyping landscape along with the roles of Austria, Czech Republic and Slovakia within the context of European plant phenotyping initiatives such as EMPHASIS and EPPN2020 with the goals of advancing basic plant research, plant breeding and fostering sustainable agriculture.

The detailed programme can be downloaded HERE.

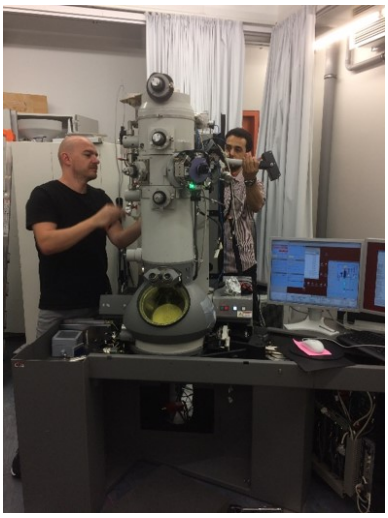
The 11th Imaging in the Life Sciences Meeting

The CMI Imaging in the Life Sciences (ILS) Meeting 2018,organized by BioImaging Austria-CMI, will take place on **September 20th & 21st** at the Vienna Biocenter Campus, Research Institute of Molecular Pathology, **IMP Lecture Hall**. The **programme** can be downloaded HERE.

VBCF PULSE

NEW SERVICES AND INSTRUMENTATION AVAILABLE!

We constantly extend our offerings of scientific services for the Campus. New items include:



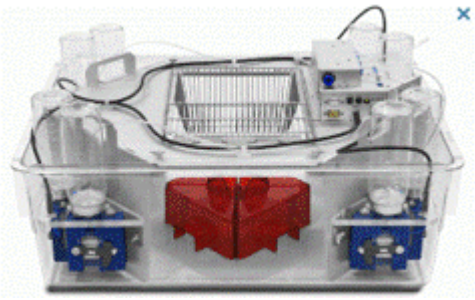
Electron Microscopy

The Polara cryo-electron microscope is being replaced by a new microscope **Glacios:**

- 200 kV cryo transmission electron microscope
- FEI / Thermo-Fisher Scientific
- Can load up to 12 samples
- Fully automated apertures & sample loading
- Equipped with Volta phase plate

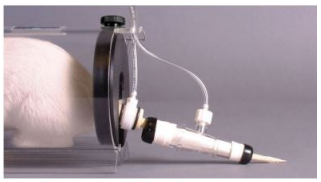
Assembly and testing are expected to be finished by the end of September.

Preclinical Phenotyping



Intellicage: an automated screening for behaviour and cognitive functions in social context.

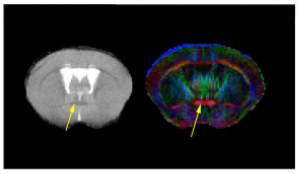
• Automated testing of up to 16 mice simultaneously, housed in a social group
• High-throughput screening of home-cage behavior and cognitive performance (operant conditioning)
• Minimized human intervention
• To be set up and made available soon (Sep 2018)!
• For more details see HERE.

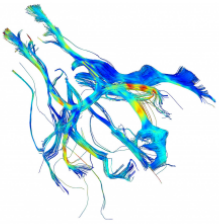


Coda Monitor:

• Non-invasive measurement of systolic and diastolic blood pressure, mean blood pressure, heart rate, tail blood volume and blood flow
• Tail cuff method: no surgery; mouse is in restrainer during measurement
• For more details see HERE.

Shared between pcPHENO and pcIMAG.





Preclinical Imaging

Interested in white matter? Preclinical Imaging is offering axonal tract tracing using **diffusion tensor imaging (DTI)**.

This powerful imaging technique allows mapping of water diffusion in the brain, potentially revealing intrinsic details about white matter in either normal or diseased states.

A T2-weighted image, diffusion tensor color map and axonal bundles of of the anterior commissure are illustrated.

NGS

NextSeq:

In order to complement HiSeq and MiSeq services, the NGS facility has acquired a **NextSeq** instrument, which will enhance the facility's flexible approach to user requests.

The NextSeq is a benchtop sequencer with fast turnaround times and a flexible output based on two types of flowcells (mid-output and high-output). Single cell sequencing will be one of the main future applications of the NextSeq sequencer.

Chromium Single Cell Controller:

Droplet based, high throughput single cell sequencing is now offered on the NGS facility by applying the recently acquired **Chromium Single Cell Controller (10X Genomics)**. Up to 5000 cells can be encapsulated and bar coded in a single experiment, allowing analysis of complex cellular environments at very low cost per cell.

Fly Food Kitchen/VDRC

The Vienna Drosophila Resource Center (VDRC) informs that the **Fly Food Kitchen** has been temporarily moved to the premises of AGES on Spargelfeldstraße in Vienna. The reason for this move is the upcoming reconstruction of the VBC6 building. After the reconstruction (2019), the facility will be moved back to the Campus. The range of services will stay unchanged throughout the whole reconstruction period.

New device for Fly Food Kitchen

The **Fly Food Kitchen** and the **Workshop** have developed a device enabling more efficient and faster filling of vials, while maintaining high quality and

homogeneity of the food. This device enables production of a higher number of fly-food-vials in a shorter time, thereby significantly increasing the efficiency of the facility.

New stocks at the VDRC

Stocks for groundbreaking "**miME-seq**" technique in flies from Ameres group, IMBA. This enables researchers to profile microRNAs in their endogenous context at cellular resolution - a level of specificity and sensitivity which was previously not possible.

PlantS

PHENOBox is an open source plant imaging and processing solution co-developed with the GMI Djamei group. The technology was exemplified by studying infection of the model grass *Brachypodium distachyon* by the head smut fungus *Ustilago bromivora*, comparing phenotypic responses of maize to infection with a solopathogenic *Ustilago maydis* (corn smut) strain and effector deletion strains, and studying salt stress response in *Nicotiana benthamiana* (for more details see the related publication).

The solution can be adapted to various phenotyping applications in plant biology and beyond.

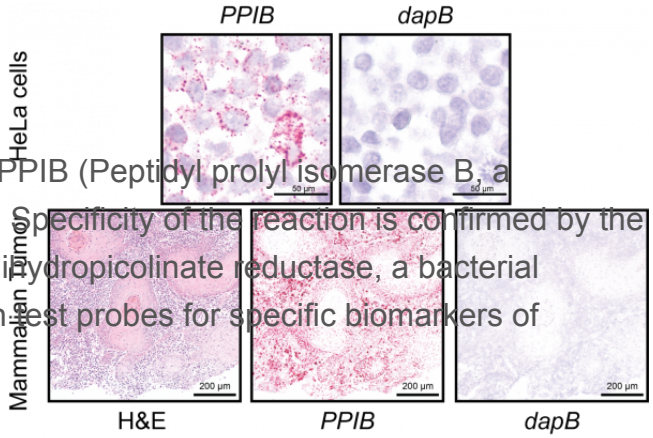
HistoPathology

New services under development:

RNAscope® (ACD Biosystems)

The facility has successfully initiated testing and optimization of **RNAscope ®** a

novel commercial nucleic acid *in situ* hybridization (ISH) technology. Chromogenic ISH with the positive control probe for PPIB (Peptidyl prolyl isomerase B, a mammalian enzyme) is illustrated. Specificity of the reaction is confirmed by the negative control probe for dapB (dihydropicolinate reductase, a bacterial enzyme). Further optimization with test probes for specific biomarkers of interest is underway.



The facility is currently performing off-site testing of the **Biogenex i6000**, a multi-functional staining system capable of performing single and multiplex immunostaining (IHC and IF) as well as classical special stains. On-site testing will be performed during autumn 2018. If validated, this system is expected to become the primary platform for routine IHC.

VBCF website update - help us to set up the best structure for you - the users!

We are currently updating the structure and content of our website. As our website is intended to provide all necessary information to our customers, this update will be guided by the results of a survey on user's experience with our website. We highly appreciate if you could take **3mins** of your time and **fill out this anonymous questionnaire** https://www.vbcf.ac.at/myvbcf-sim/vbc-website-survey **until Sept 17th** .

WHAT HAPPENED - brief info on past events

Events organized within the project RIAT-CZ

Interreg
Austria-Czech Republic
European Regional Development Fund

Several workshops were organized within the scope of RIAT-CZ with focus on mutual exchange of knowledge among experts of the AT - CZ cross-border region in their respective fields of expertise The events were supported by the programme Interreg AT-CZ V-A, project RIAT-CZ, No. ATCZ40.

Modern Plant Microscopy

• February 16th 2018 at IMBA

From Robert Hooke's fateful first experiments on cork cells over 350 years ago, optical microscopy of plants is almost an eternity from where it all began.

As a celebration of subsequent milestones, the "Modern Plant Microscopy" meeting gave center stage to six leading researchers in the field of optical microscopy and spectroscopy to present their latest findings and highlight how they helped us gain a deeper insight into the complex processes underlying the biology of plants.

2nd APPN meeting & EPPN workshop

- April 17-18th 2018 at BOKU

The 2nd APPN & EPPN Meeting**,** held in the beutiful historical assembly hall at BOKU, Vienna, was devoted to featuring **root phenotyping technologies**. Part of the event was held in Tulln as Hands-on Workshop on Hyperspectral Root Phenotyping.

The meeting attracted over 60 phenotyping specialists from 8 European countries, which confirmed the growing interest in plant phenotyping and its necessity for plan research and agronomy.

Practical workshops on the TSE systems: IntelliCage, PhenoMaster & MotoRater

• May 15-18th 2018, Olomouc, CZ

pcPHENO participated in 1 week of intensive training on TSE-equipment (Phenomaster, Intellicage, MotoRater) at the animal facility of our Interreg partners from the International Clinical Research Center at the St.Anne's Hospital Brno, Czech Republic.

Low input/ChIP-Seq Library Preparation Hands-on Workshop

• June 18th 2018 at CEITEC, Brno, CZ

The hands-on workshop with focus on low DNA input NGS library preparation, sample and library quality control, and experimental design and data analysis, was co-organized with the CEITEC Genomics facility at CEITEC, Brno.

Changing the field: An Introduction to Magnetic Particle Imaging

• June 27th 2018, VBCF

Matthew Smith, the vice president of Magnetic Insight, gave a talk on Magnetic particle Imaging technology.

Vienna Region cryo-EM Seminars

On April 26 & 27 the EM Facility hosted the annual Advanced EM Workshop of the Austrian Society for Electron Microscopy (ASEM). This event brought together the Austrian EM communities within the

Material and Life Sciences along with all leading electron microscope manufacturers and suppliers. It was attended by more than 100 people.

FEATURED NEWS

The biggest Sacher-cake you've ever seen! The PlantS facility has celebrated 5 years of its operation.

The **Plant Sciences Facility (PlantS)** operates high quality state-of-the-art and highly specialized plant growth chambers and provides professional support to research groups at the VBC and other customers. In 2017, PlantS initiated the Austrian Plant Phenotyping Network (APPN) which is continuously growing. In August 2018, the facility celebrated 5 years of its successful operation with plenty of "Heurigen-Schmankerl", local wine and beer, live music, and relaxed

atmoshere on the Campus Bridge. And - last, but not least - with a huge and yummy Sacher-cake.

Ex core facility head passed away

Our valued colleague **Mumna Al Banchaabouchi** passed away on February 22nd, 2018.

Mumna served as the head of the Preclinical Phenotyping facility from 2012 until her sick leave in 2014. When Mumna joined the VBCF, it quickly became clear that she was much more than a passionate scientist. She was a great colleague with a sunny smile, a friendly word, and an open ear for everyone. She was a warm and caring person who was full of energy and inspired all those around her with her great spirit.

Our thoughts are with her family in Belgium and Morocco and with all her friends all over the world.

New COST Action awarded

The CMI head and main proposer of the Action Andreas Walter has been elected the chair of a newly awarded COST Action Correlated Multimodal Imaging in Life Sciences **(COMULIS).**

Duration: 4 years
Partners: VBCF (Action Main Proposer), 90 other partners from 29 countries
Funded by: EU/COST

The COST Action COMULIS aims at:

• Bringing together experts on **correlated multimodal imaging**
• Promoting and disseminating its benefits through showcase pipelines
• Paving the way for its technological advancement and implementation as a versatile tool in biological and preclinical research.

Cross-border cooperation project CAPSID

Duration: 01. 07. 2018 – 30. 06. 2021

Partners:

• Vienna Biocenter Core Facilities GmbH (Lead partner)
• Biomedical Research Center of the Slovak Academy of Sciences

Funded by: ERDF (European Regional Development Fund)

Project summary:

CAPSID (Scientific Capacity Building in the Production of Glycoproteins and Viral Proteins for Biomedical Research) is a project supported by by the programme Interreg V-A Slovakia - Austria with the aim to develop new services in the field of viral proteins and glycoproteins which will be beneficial for the whole VBC campus.

Summer stipends for youth

VBCF supports young talented students by sharing its expertise with them. Altogether 6 female university students supported by the FFG programme FemTECH Praktika, and 4 high-school students supported by the FFG programme Talente endecken were accepted for their up to 6-months fellowships at VBCF where they actively take part in the operation of the core facilities or in development of innovative services.

Welcome!

Project title	Programme	Student	Core facility	Supervisor	Duration
Multimodal Imaging	FemTech	Daria Meusburger	CMI	Andreas Walter	6 months
Onco-Metabolomics	FemTech	Clara Schramm	Metabol	Thomas Koecher	6 months
SISYimage	FemTech	Selina Brinnich	SIM	Thomas Micheler	5 months

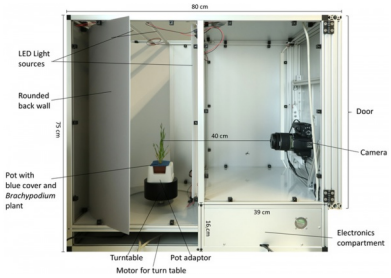
Controlled induction of hyperthermia by nanoparticles in magnetic resonance imaging

A project of the programme Scientific & Technological Cooperation funded by OeAD to support development of bilateral scientific collaboration. The project aims at investigation of tumors inducing hyperthermia treatment by specific nanoparticles using MRI.

Duration: 2 years

Partners:

• Core facility Preclinical Imaging, VBCF
• Institute of Nuclear Sciences Vinca, Belgrade, Serbia



VBCF in the press

Phenobox

The '**PhenoBox**', a flexible, automated, open-source plant phenotyping solution was published as a peer-reviewed scientific publication (see the section "Publications"), as well as in the newspaper "Die Presse", and the Austrian radio programme devoted to science "science@ORF.at".

• Welche Pflanze kriegt den Pilz? Die Presse, 11.05.2018
• Fünf Jungforscherinnen ausgezeichnet. ORF Wissen aktuell, 22.11.2017

Success Story: BioBrillouin >> Three-dimensional against cancer!

An FFG article informs on the successful COST Action "BioBrillouin" led by Kareem Elsayad (Advanced Microscopy).

• #Success Story: BioBrillouin >> Dreidimensional gegen Krebs! FFG, 17.08.2018

ANNOUNCEMENTS

WE HAVE NEW COLLEAGUES! AND WE SAY GOODBYE TO SOME OTHERS.....

Michaela Thoß was appointed as **Grants Manager Junior**. Her main responsibility is management and administration of running grant projects.

Klara Wuketich, technician in the PlantS facility, leaves VBCF at the end of September.

The VDRC technicians announce the following changes:

Jadwiga Rybarczyk has left for maternity leave. She will be replaced by **Nicole Teufl** (fly maintenance) and **Sabine Weissmayer** (shipping lab).

Fly Food Kitchen:

Janusz Petri has retired from the VDRC Fly Food Kitchen. **Michaela Vaskova**, **Ester Passoni**, **Aurelia Trubel** and **Susanne Miggitsch** have left and **Victoria Weissenboeck** and **Oskar Wesel** have joined.

RECENT PUBLICATIONS

β-Catenin–dependent mechanotransduction dates back to the common ancestor of Cnidaria and Bilateria. Ekaterina Pukhlyakova, Andrew J. Aman, **Kareem Elsayad**, and Ulrich Technau. *PNAS May 21, 2018. 201713682*

Full article >>

Monoacyl-phospatidylcholine based drug delivery systems for lipophilic drugs: Nanostructured lipid carriers vs. nano-sized emulsions. Wolf M., Reiter F., **Heuser T., Kotisch H.,** Klang V. and Valenta C. (2018). *Journal of Drug Delivery Science and Technology 46:490-497*

Abstract >>

Genetically engineered cerebral organoids model brain tumor formation. Bian S, Repic M, Guo Z, **Kavirayani A**, Burkard T, Bagley JA, Krauditsch C, Knoblich JA. *Nat Methods. 2018 Aug;15(8):631-639.*

Full article >>

SLAM-seq defines direct gene-regulatory functions of the BRD4-MYC axis. Muhar M, Ebert A, Neumann T, Umkehrer C, Jude J, Wieshofer C, Rescheneder P, Lipp JJ, Herzog VA, Reichholf B, Cisneros DA, Hoffmann T, Schlapansky MF, Bhat P, von Haeseler A, **Köcher T**, Obenauf AC, Popow J, Ameres SL, Zuber J. *Science 2018 Apr 05.*

Abstract >>

Dorsal tegmental dopamine neurons gate associative learning of fear. Groessl F, Munsch T, Meis S, Griessner J, Kaczanowska J, Pliota P, Kargl D, **Badurek S**, **Kraitsy K**, Rassoulpour A, Zuber J, Lessmann V, Haubensak W. *Nat Neurosci. 2018 Jul;21(7):952-962.*

Abstract >>

Stress peptides sensitize fear circuitry to promote passive coping. Pliota P, Böhm V, Grössl F, Griessner J, Valenti O, **Kraitsy K**, Kaczanowska J, Pasieka M, Lendl T, Deussing JM, Haubensak W. *Mol Psychiatry. 2018 Jun 14. doi: 10.1038/s41380-018-0089-2. [Epub ahead of print].*

Full article >>

The'PhenoBox', a flexible, automated, open-source plant phenotyping solution. Czedik-Eysenberg, A., Seitner, S., Güldener, U., **Koemeda, S.**, **Jez, J.**, Colombini, M., & Djamei, A. (2018). *New Phytol. 2018 Jul;219(2):808-823.*

Abstract >>

UFD-2 is an adaptor-assisted E3 ligase targeting unfolded proteins. Hellerschmied D, Roessler M, **Lehner A**, Gazda L, Stejskal K, Imre R, Mechtler K, Dammermann A, Clausen T *Nat Commun 2018 02 02; 9 (1)*

Abstract >>

Baculovirus-driven protein expression in insect cells: A benchmarking study. Stolt-Bergner P, Benda C, Bergbrede T, Besir H, Celie PHN, Chang C, Drechsel D, Fischer A, Geerlof A, Giabbai B, van den Heuvel J, Huber G, Knecht W, **Lehner A**, Lemaitre R, Nordén K, Pardee G, Racke I, Remans K, Sander A, Scholz J, Stadnik M, Storici P, Weinbruch D, Zaror I, Lua LHL, Suppmann S. *J. Struct. Biol. 2018 Mar 12.*

Abstract >>

ACKNOWLEDGEMENTS

p62 filaments capture and present ubiquitinated cargos for autophagy. Zaffagnini G., Savova A., Danieli A., Romanov J., Tremel S., Ebner M., Peterbauer T., Sztacho M., Trapannone R., Tarafder AK., Sachse C., Martens S. *The EMBO Journal (2018) e98308, DOI 10.15252/embj.201798308*

Full article >>

SUMO chain formation relies on the amino-terminal region of SUMO conjugating enzyme and has dedicated substrates in plants. Tomanov K., Nehlin L., Ziba I., Bachmair A. (2018). *Biochemical Journal* 475(1):61-74

Full article >>

The IAP family member BRUCE regulates autophagosome-lysosome fusion. Ebner P., Poetsch I., Deszcz L., Hoffmann T., Zuber J., Ikeda F. (2018). *Nat Commun. 9(1):599*

Abstract >>

The Inner Nuclear Membrane Is a Metabolically Active Territory that Generates Nuclear Lipid Droplets. Romanauska A & Köhler A. *2018 Cell 174(3):700-715*

Full article >>

Use of the **NGS** facility has been regularly acknowledged in various publications including the following three examples:

In vivo insertion pool sequencing identifies virulence factors in a complex fungal-host interaction.
Uhse S, Pflug FG, Stirnberg A, Ehrlinger K, von Haeseler A, Djamei A. *PLoS Biol. 2018 Apr; 16 (4)*

Abstract >>

Coordinated Control of mRNA and rRNA Processing Controls Embryonic Stem Cell Pluripotency and Differentiation. Corsini NS, Peer AM, Moeseneder P, Roiuk M, Burkard TR, Theussl HC, Moll I, Knoblich JA. *Cell Stem Cell 2018 Apr 05; 22 (4)*

Abstract >>

SLAM-seq defines direct gene-regulatory functions of the BRD4-MYC axis. Muhar M, Ebert A, Neumann T, Umkehrer C, Jude J, Wieshofer C, Rescheneder P, Lipp JJ, Herzog VA, Reichholf B, Cisneros DA, Hoffmann T, Schlapansky MF, Bhat P, von Haeseler A, Köcher T, Obenauf AC, Popow J, Ameres SL, Zuber J. *Science 2018 Apr 05*

Abstract >>

Use of **VDRC** resources has been acknowledged in 206 publications in 2018 so far, including the following:

ER Lipid Defects in Neuropeptidergic Neurons Impair Sleep Patterns in Parkinson's Disease. Valadas JS, Esposito G, Vandekerkhove D, Miskiewicz K, Deaulmerie L, Raitano S, Seibler P, Klein C, Verstreken P. *Neuron. 2018 Jun 27;98(6):1155-1169.e6.*

Abstract >>

The asymmetrically segregating lncRNA cherub is required for transforming stem cells into malignant cells. Landskron L, Steinmann V, Bonnay F, Burkard TR, Steinmann J, Reichardt I, Harzer H, Laurenson AS, Reichert H, Knoblich JA. *Elife. 2018 Mar 27;7.*

Abstract >>

An RNAi Screen Identifies New Genes Required for Normal Morphogenesis of Larval Chordotonal Organs. Hassan A, Timerman Y,

Hamdan R, Sela N, Avetisyan A, Halachmi N, Salzberg A. *G3 (Bethesda). 2018 May 31;8(6):1871-1884.*

Abstract >>

VBCF LIFE

VBCF runs!

VBCF has participated in two running events in the last half a year:

May 19th 2018: the **Crazy 5 K run** - a run over 10 inflatable obstacles. It was plenty of fun with the colleagues!

June 16th 2018: the **X-Cross run** in Prater, Vienna. A 5.6- or 11.2- km run over and through the most spectacular obstacles you can imagine!

New babies at VBCF

The VBCF is happy to announce that three sweet babies were born during the past six months:

Ylvie, daughter of the CF Preclinical Phenotyping behavioral specialist Klaus Kraitsy, born on 21st February 2018.

Martin, son of the CF Preclinical Imaging research technician Jennifer Pizzaro, born on 18th April 2018.

Paul Michael Valentin, son of the CF Preclinical Phenotyping behavioral specialist Anna Jelem, born on 19th April 2018.

Welcome to the world!