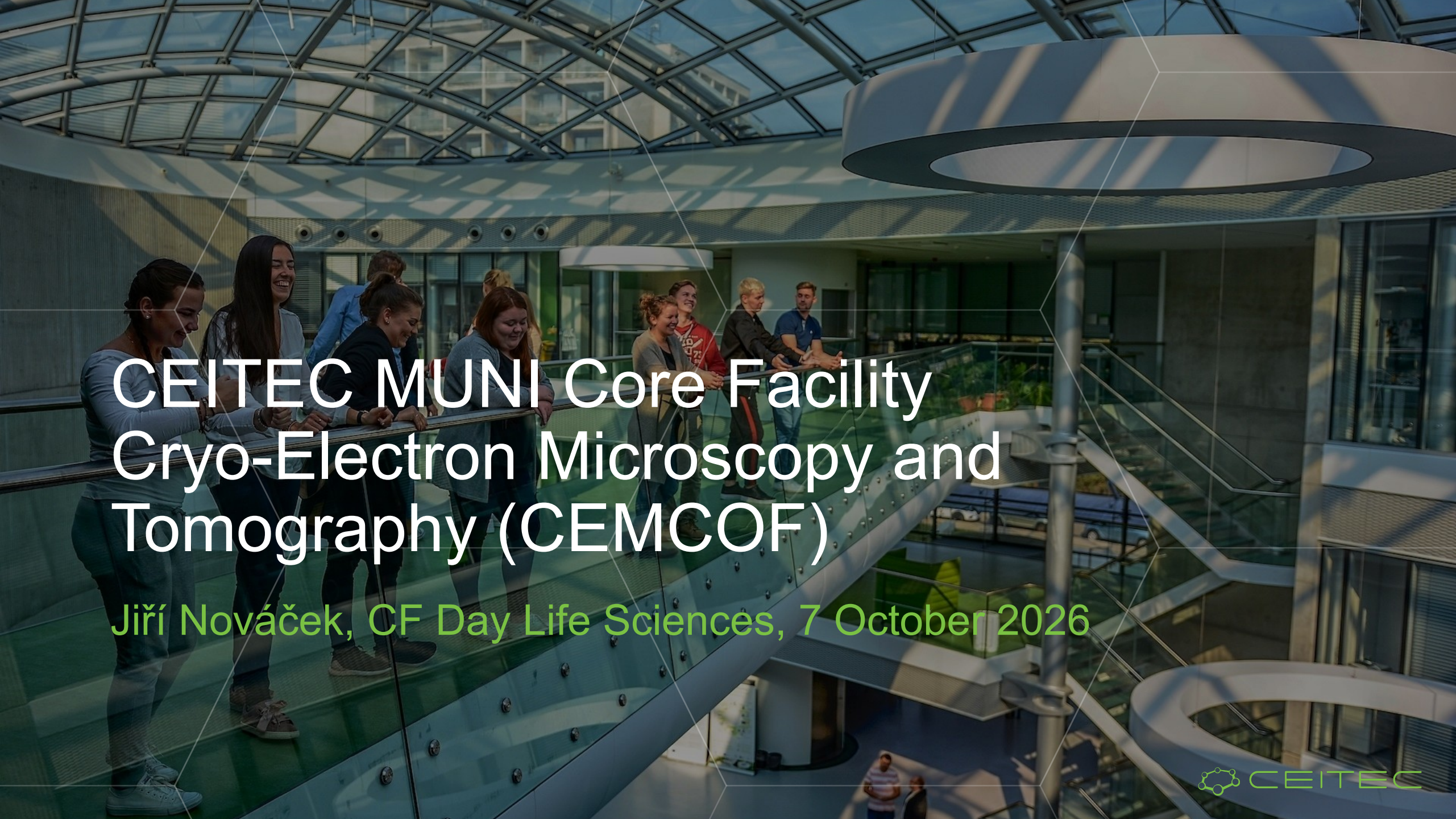


CEITEC MUNI Core Facility Cryo-Electron Microscopy and Tomography (CEMCOF)

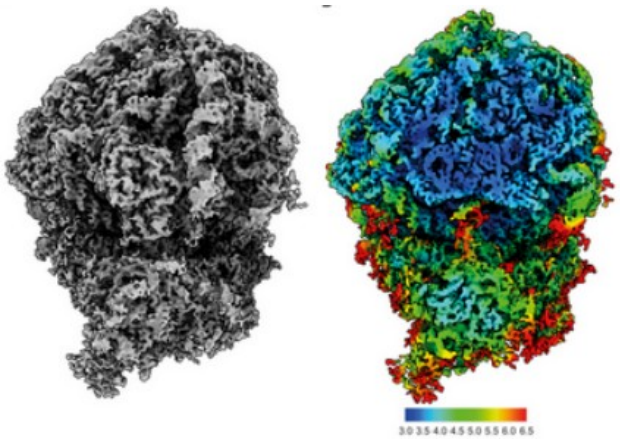
Jiří Nováček, CF Day Life Sciences, 7 October 2026

CEITEC

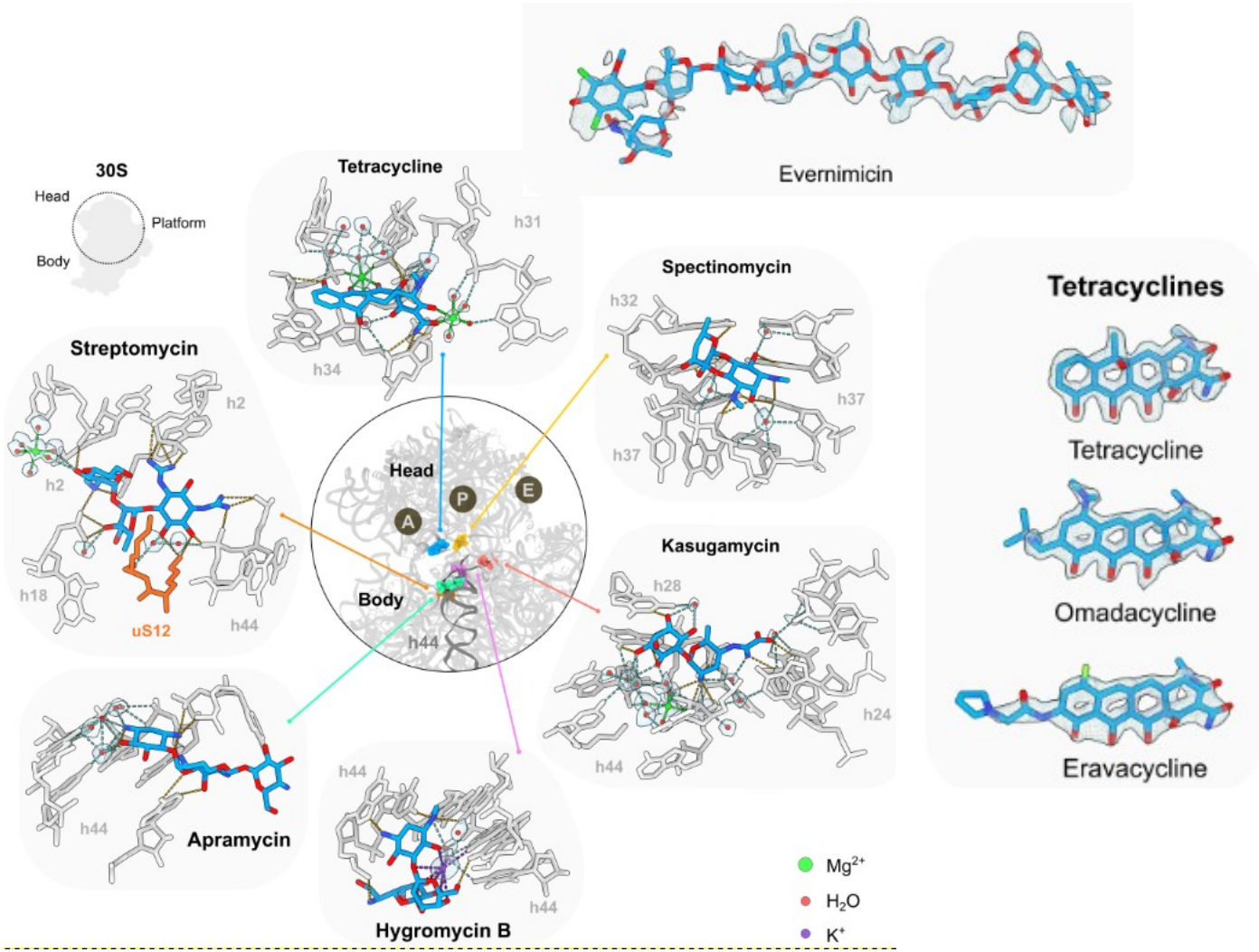
User project: antibiotics on the ribosome at 1.6–1.8 Å

Single particle cryo-EM

- Bacterial 70S ribosome with a panel of antibiotic classes
- First sub-2 Å antibiotic complexes
- Waters and ions resolved in the binding pockets
- Structural basis of antibiotic binding



Paternoga et al., Nat. Struct. Mol. Biol. 2023



User project: tau pathology in native brain tissue

- SHR24 rat model (tau 151–391): tau tangles in the motor cortex
- In vivo Methoxy-X04 labelling makes aggregates visible for cryo-CLEM

Hydra workflow

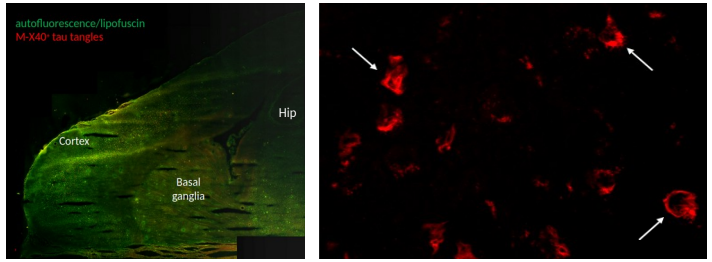
iFLM targeting

iFLM/SEM correlation

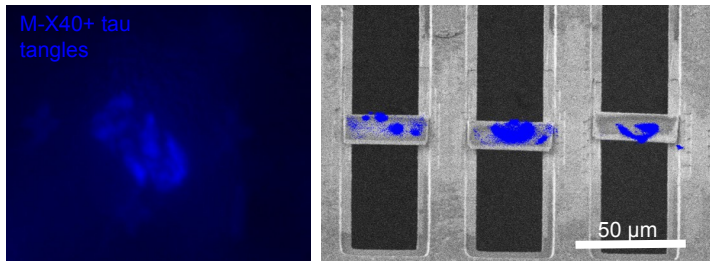
CLO / lamellae preparation

Cryo-ET

room temperature FLM

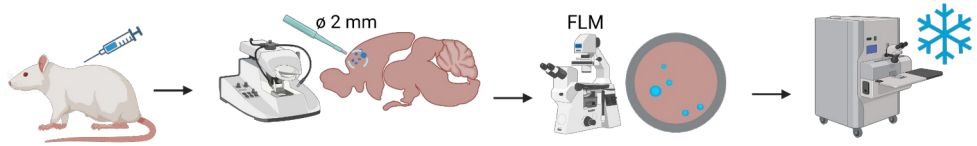


cryo-FLM on vitrified tissue



Cryo-ET workflow for non-fixed brain tissue

Fresh brain tissue cryo-preservation



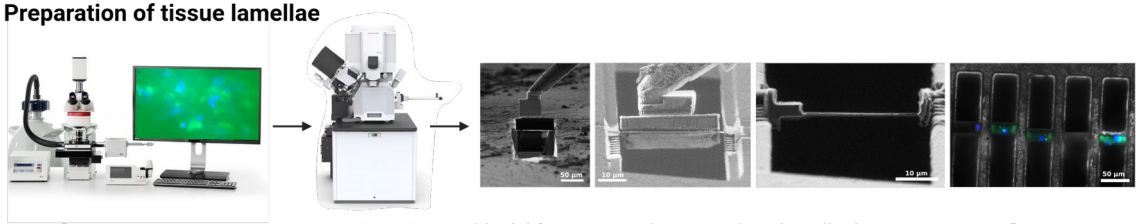
M-X04 injection to target tau aggregates

sectioning into 100 µm slices and cutting biopsies in aCSF

selection of M-X04 positive biopsies

high-pressure freezing vitrification

Preparation of tissue lamellae



cryo-fluorescence mapping and possition selection

cryo-FIB/SEM serial lift-out

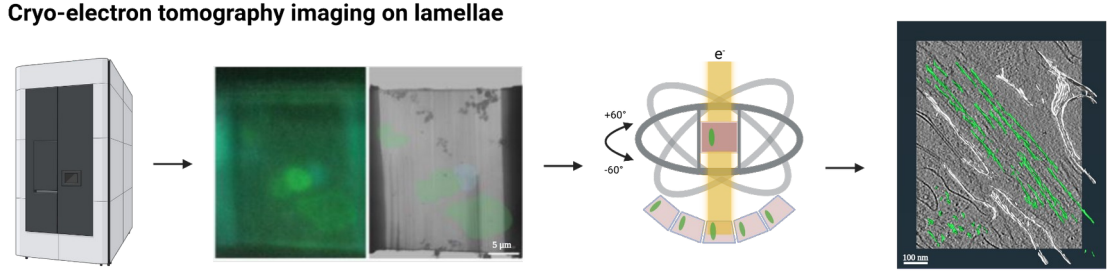
block lift-out

attachment and slicing

lamella thinning to ~200 nm

cryo-fluorescence imaging on lamellae

Cryo-electron tomography imaging on lamellae



cryo-ET tilt series collection

correlation of cryo-fluorescence image with lamella montage

tilt-series collection

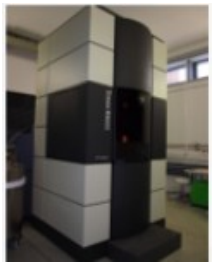
tomogram reconstruction and segmentaion

Hana Nedozrálová, Lukáš Žídek – Protein Structure and Dynamics RG, CEITEC MU

CEITEC

CEMCOF: instruments and services

User or service mode available on all instruments



FFI
PhasePlate
Bioquantum K3

Titan Krios

TEM/SEM imaging

SPA data collection

Data analysis

Cryo-ET data collection



FFI
Selectris
Falcon 4i

Talos
Arctica

Cryo-FIB lamella preparation

CLE
M

Electron diffraction tomography



PFIB
Xe,Ar,O
iFLM

Arctis



immers. SEM
PFIB - Xe,Ar,O,N
cryo-lift out
iFLM

Helios
Hydra

Initial structural screening

https://cryo.ceitec.cz
@cemcof

itial cryo-EM screening

Cryo-volume EM



Falcon 4i
STEM

Glacios 2

HPF

Sample vitrification

FIB-SEM tomography

Resin embedding

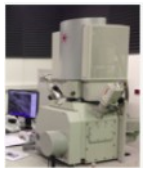
Freeze substitution

Cell culture



Talos
F200C

STEM
EDS
Quadro



Versa3D

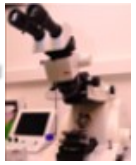














Modes of operation

Service

- Our staff prepares grids, collects and pre-processes data for you
- Best for one-off projects or tight deadlines

Training

- Hands-on training in sample preparation, instruments and data processing
- The usual path for long-term projects

Independent operation

- Trained users book and run instruments themselves
- Staff support stays available

Who uses CEMCOF

~70 / 30 %
internal / external users

~50 %
of internal users train for independent operation

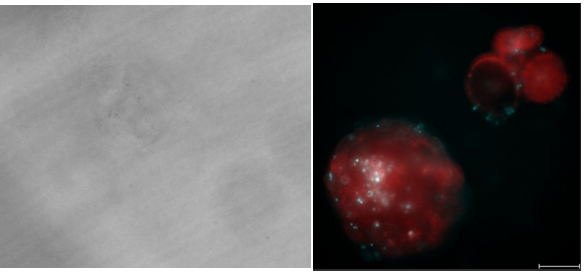
>90 %
of external users choose the service mode

CEITEC

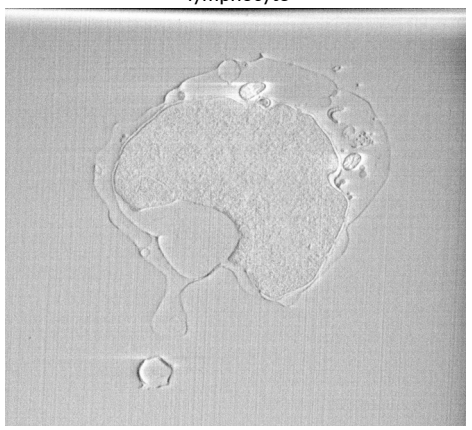
Developing Cryo-CLEM to versatile service

Hydra workflow

(on grid, waffle, HPF carrier)

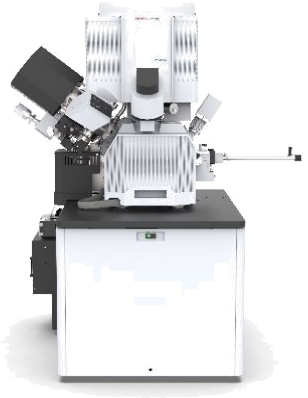


iFLM targeting

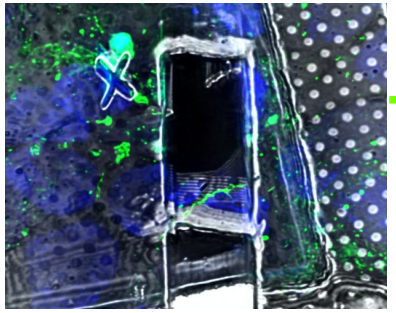


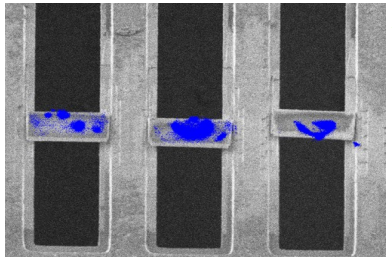
lymphocyte

cryo-volume imaging



Lamella preparation



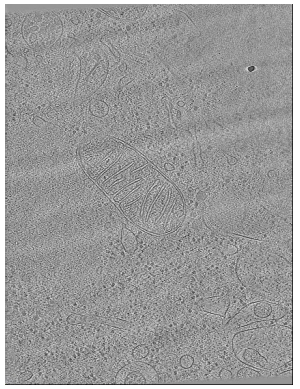


Serial lift-out

tau fibrils

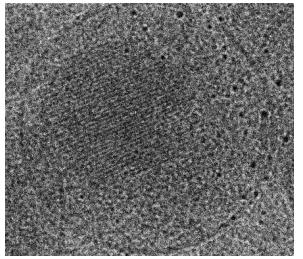


mitochondrial complexes





spermatid microtubules



insulin granules

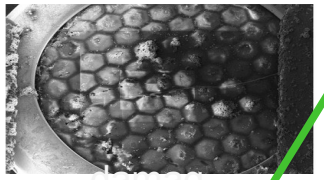


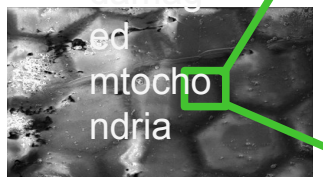
Cryo-ET

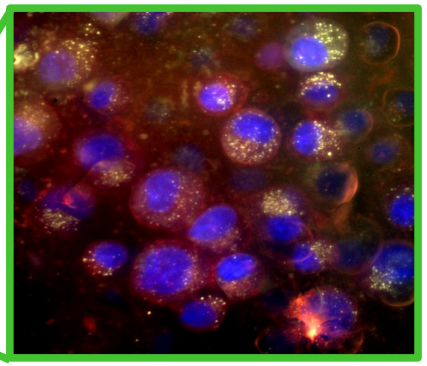
Arctis workflow

(on grid, waffle samples)

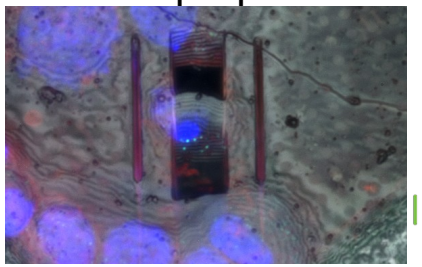
iFLM targeting





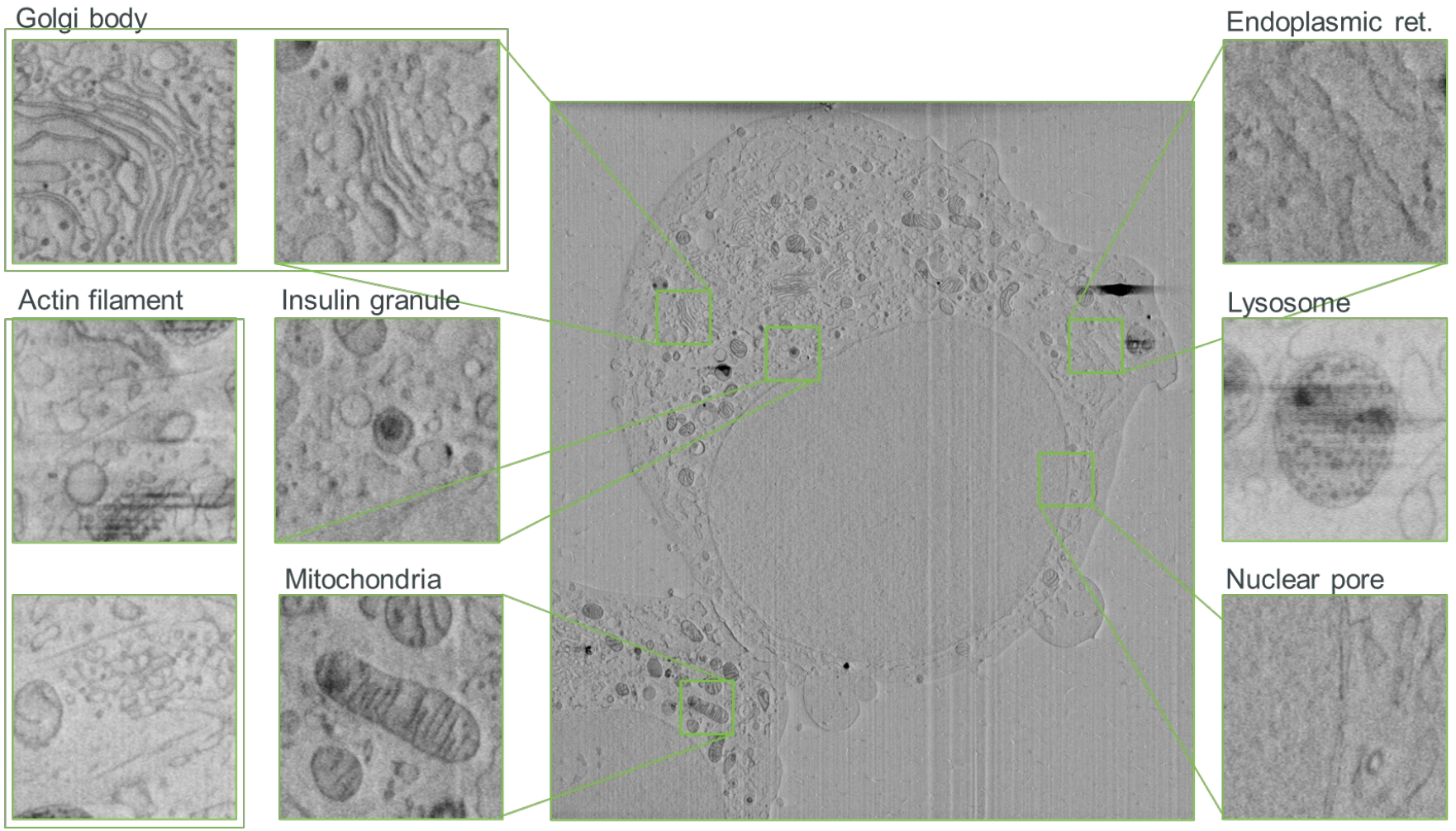


Lamella preparation



ITEC

Cryo-volume EM: whole cells in 3D at nanometre resolution



INS-1 cell, one dataset

2093
serial slices

10 nm
slice distance

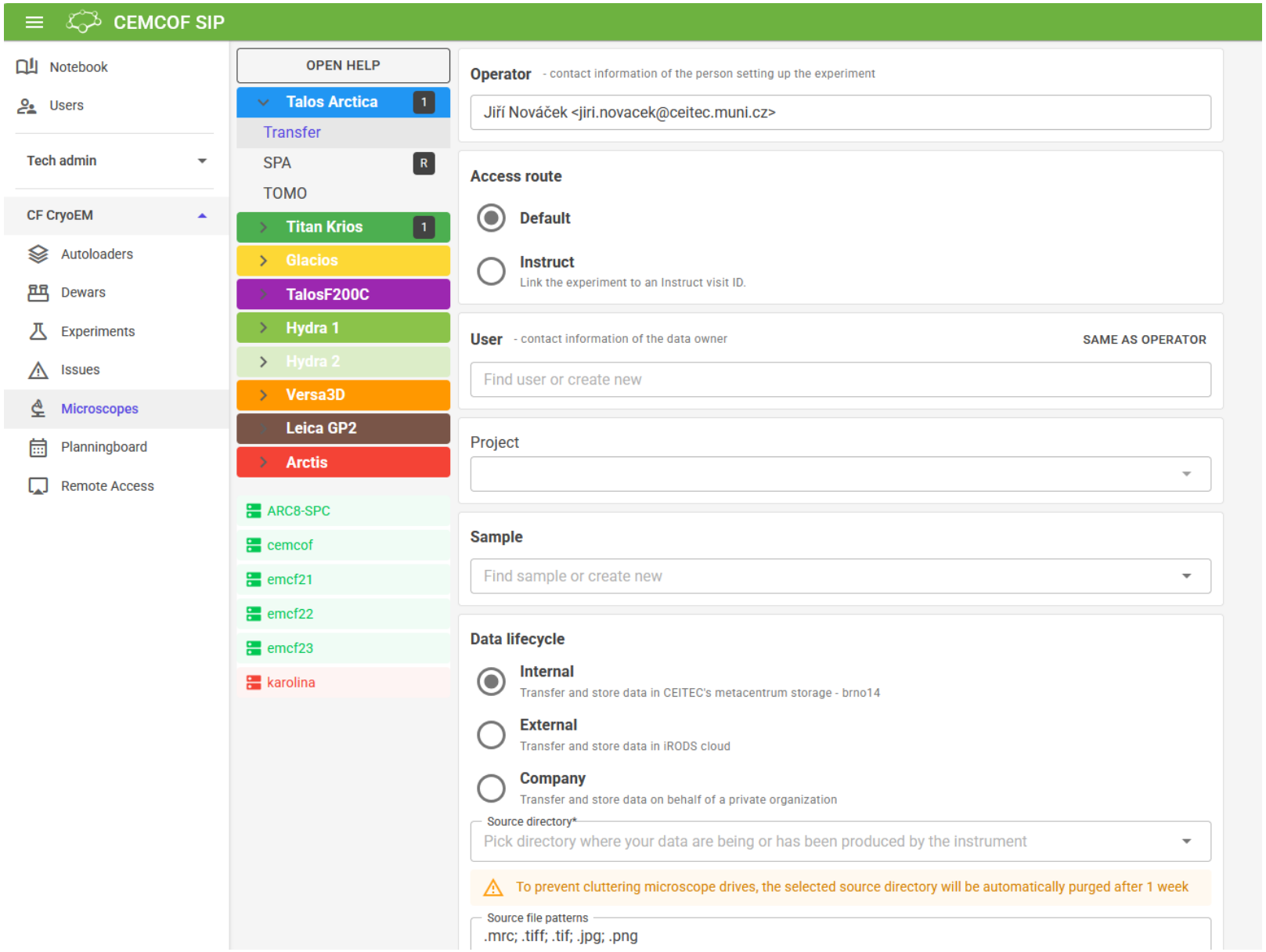
2.5 nm
pixel size

~8400 µm³
cell volume imaged

48 h
acquisition time

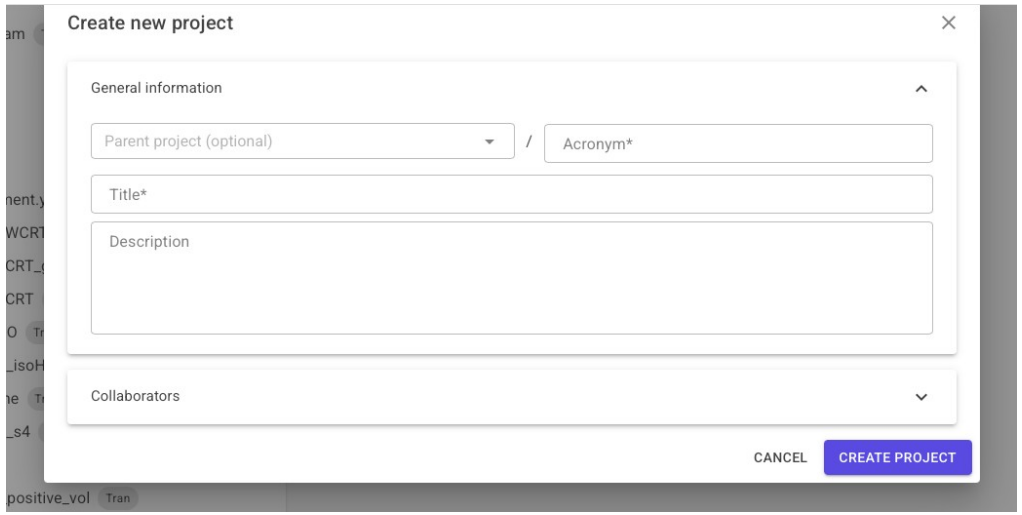
CEITEC

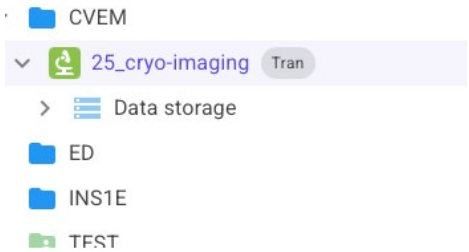
SIP


CEMCOF SIP
Notebook
Users
Tech admin
CF CryoEM
Autoloaders
Dewars
Experiments
Issues
Microscopes
Planningboard
Remote Access
OPEN HELP
Talos Arctica 1
Transfer
SPA R
TOMO
Titan Krios 1
Glacios
TalosF200C
Hydra 1
Hydra 2
Versa3D
Leica GP2
Arctis
ARC8-SPC
cemcof
emcf21
emcf22
emcf23
karolina
Operator - contact information of the person setting up the experiment
Jiří Nováček <jiri.novacek@ceitec.muni.cz>
Access route
Default
Instruct
Link the experiment to an Instruct visit ID.
User - contact information of the data owner
SAME AS OPERATOR
Find user or create new
Project
Sample
Find sample or create new
Data lifecycle
Internal
Transfer and store data in CEITEC's metacentrum storage - brno14
External
Transfer and store data in iRODS cloud
Company
Transfer and store data on behalf of a private organization
Source directory*
Pick directory where your data are being or has been produced by the instrument
To prevent cluttering microscope drives, the selected source directory will be automatically purged after 1 week
Source file patterns
.mrc; .tiff; .tif; .jpg; .png

CEITEC

SIP Lab Notebook: dataset organization and storage



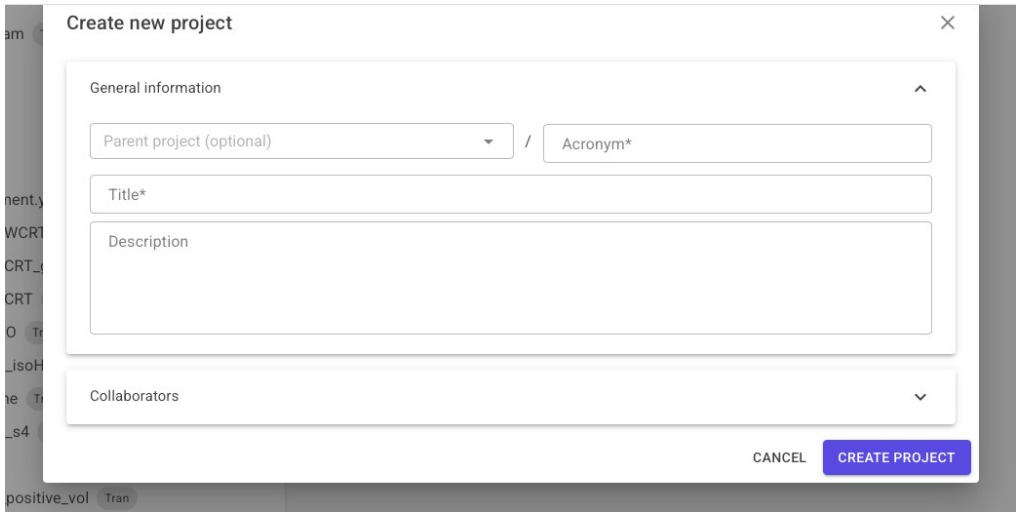


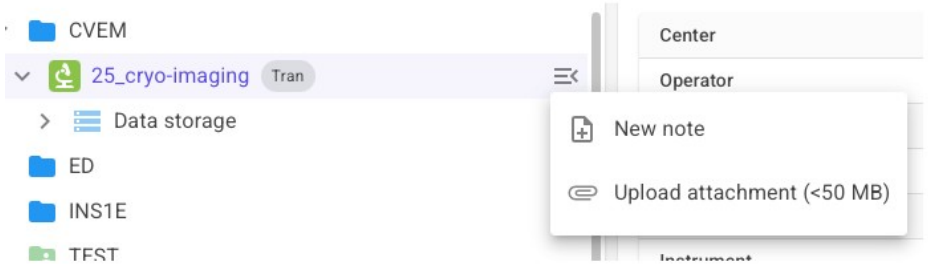
Projects and subprojects

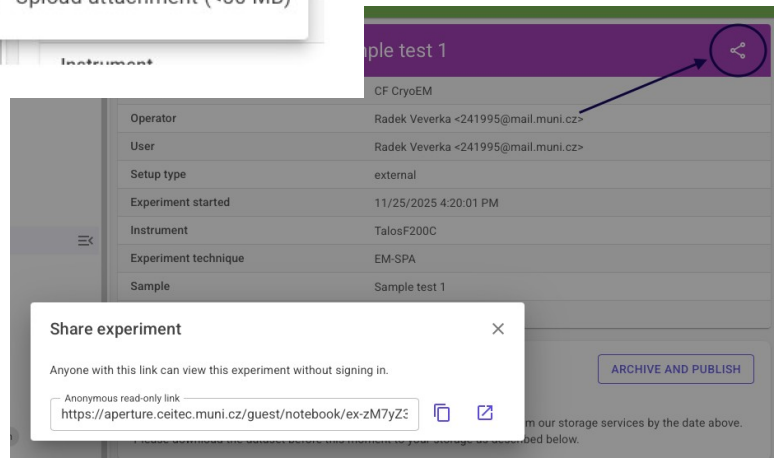
Collaborators and share links

Guest access

SIP Lab Notebook: dataset organization and storage

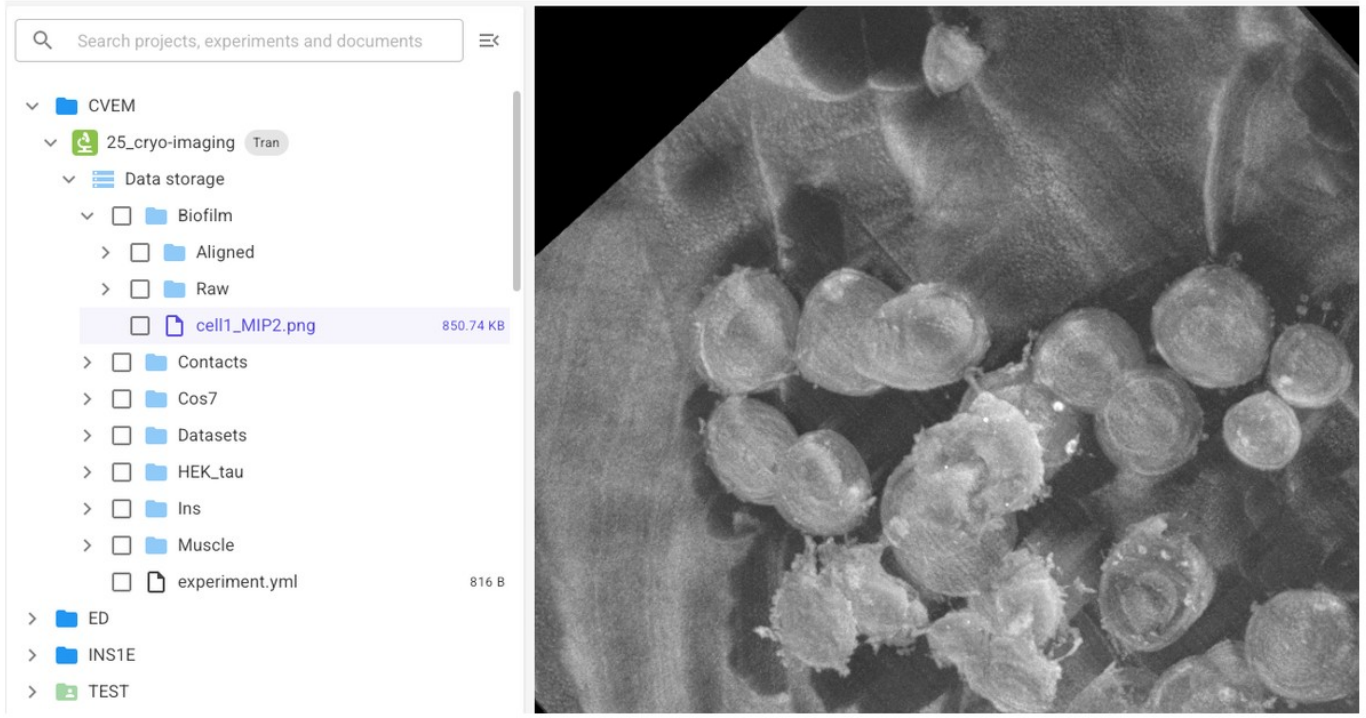






- **Projects and subprojects**
- **Collaborators and share links**
- **Guest access**

SIP: data download and export



Preview without downloading

Download

Export to Google Drive, Dropbox, SharePoint

Access pipeline



Contact us
e-mail or visit

Consultation
feasibility & sample

Register project
CIISB proposal form

Service or training
data collection

Acknowledge
in your publication

Open access via CIISB / Instruct-CZ

- Continuous call, internal and external users, no geographical restrictions
- Online proposal; project active for 18 months, simple extension
- User contribution 15 % of the service cost (typically < 10 EUR per instrument hour)

www.ciisb.org

Acknowledgement

We acknowledge Cryo-electron microscopy and tomography core facility CEITEC MU of CIISB, Instruct-CZ Centre, supported by MEYS CR (LM2023042) and European Regional Development Fund-Project „Innovation of Czech Infrastructure for Integrative Structural Biology“ (No. CZ.02.01.01/00/23_015/0008175).

CEITEC

CEMCOF team and contacts



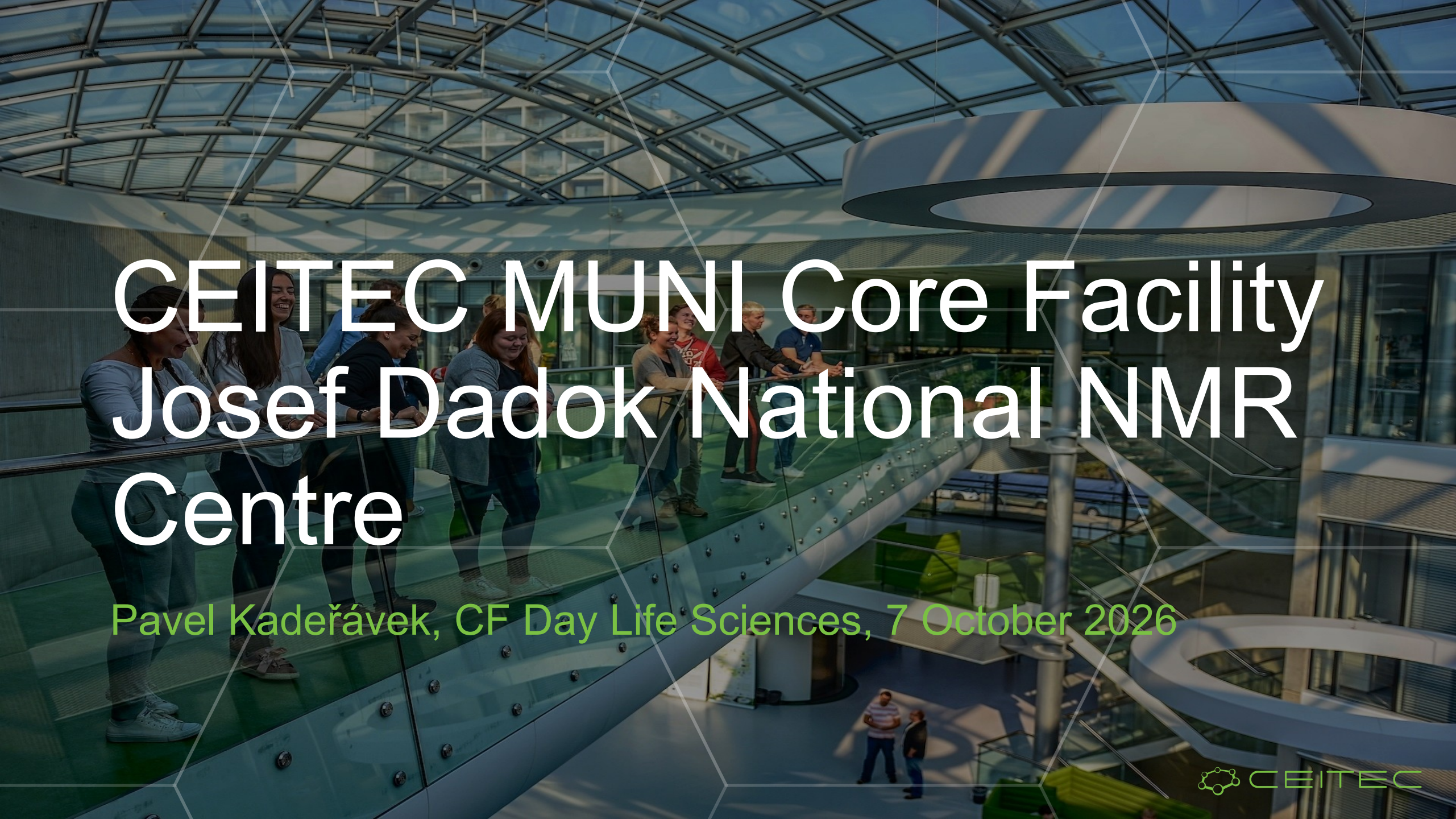
Team

Daniel Pinkas
Zuzana Hlavenkova
Radka Holbova
Radek Veverka
Karel Skubnik
Pavel Krepelka
Matyas Pinkas
Zlatka Plavec
Jana Moravcova
Lucie Valentova

cryo.ceitec.cz

core.facility@ceitec.muni.cz

CEITEC



CEITEC MUNI Core Facility Josef Dadok National NMR Centre

Pavel Kadeřávek, CF Day Life Sciences, 7 October 2026

CEITEC

Content

- When and Why use NMR
- People
- Equipment
  - New equipment
- Access, Training, Data policy, Financial support
  - Acknowledgments
- Selected publications

NMR Spectroscopy

Strengths:

- Atomic resolution – **detailed** information
- Applicable both in **solution and solid** state
- Good for compound identification, quality control, structure determination
- Can study **dynamics & kinetics & interactions**
- **Gentle** to the sample

Weaknesses:

- Low sensitivity
- Needs lot of sample, measurements long, often needs isotope enrichment
- Data interpretation laborious
- Expensive equipment

Sample:

- Nuclei ^{1}H, ^{13}C, ^{15}N, ^{31}P, ^{19}F routinely, many others possible
- **0.1 to 30 mg for liquids** (depending on nucleus and MW)
- **~ 10 mg for solids**
- **Solubility**
- **Stability**
- **Temperature (liquid)** (-80°C to 150°C)

- **Know what are you trying to find out**
- *Type of experiment*
- *Send the publication that inspired you!*

People

Pavel Kadeřávek - CF head (CIISB, Instruct administration)
- Training
- Specialisation: biomolecules (dynamics)

Radovan Fiala - deputy head (CIISB, Instruct administration)
- Training
- Specialisation: biomolecules (nucleic acids)

Jaromír Toušek
- booking
- hardware maintanance (probes exchange)
- measurement for external users

Kateřina Bouzková
- solid state NMR
- small molecules measurement

Otakar Humpa
- measurement for external users

Michaela Dzurov Krafčíková
- solid state NMR, biomolecules (nucleic acids), in-cell NMR

Petr Padrta
-user accounts, IT support
- NMR software, advanced NMR processing (NUS)








Equipment

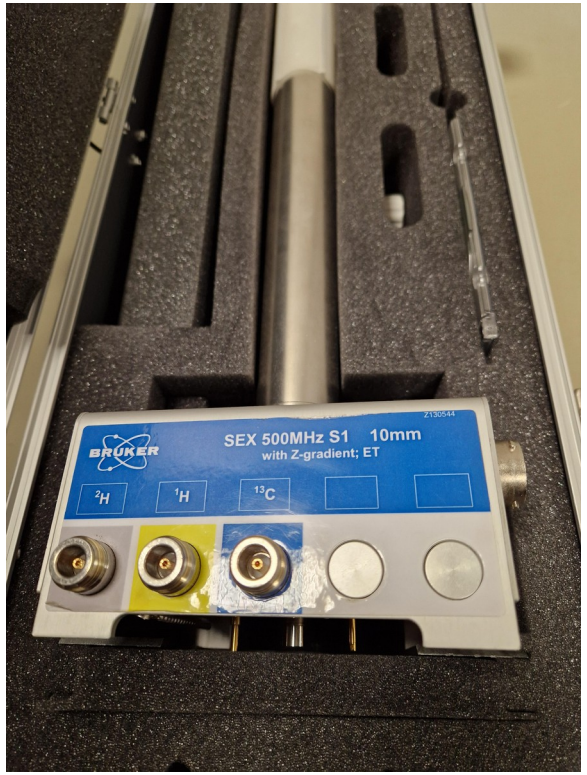
- **6 NMR spectrometers**
  - 500 MHz, 600 MHz, two 700 MHz, 850 MHz, 950 Mhz
- **Neo electronics**
- **extended temperature range** <-40℃, +150 ℃ >
- **4 cryoprobes** optimized for **^{1}H detection**
  - inverse cryoprobes allows **^{19}F detection**
- **2 cryoprobes** optimized for **^{13}C detection** (700, 850MHz)
- **solid-state** possible at 500 and 700 MHz
  - up to 24 kHz rotation
- **Diffusion probe** 700 MHz
- Simple **X-band EPR** spectrometer



CEITEC

New equipment

- **Dual 10mm probe**
  - (polymer analysis)



Helium liquifier (soon)

- Reduce running cost of CF
- Counterbalance to rising helium price
- (Qatar 30% of helium production – March 2026 attacked Ras Laffan Industrial City, Hormuz strait)

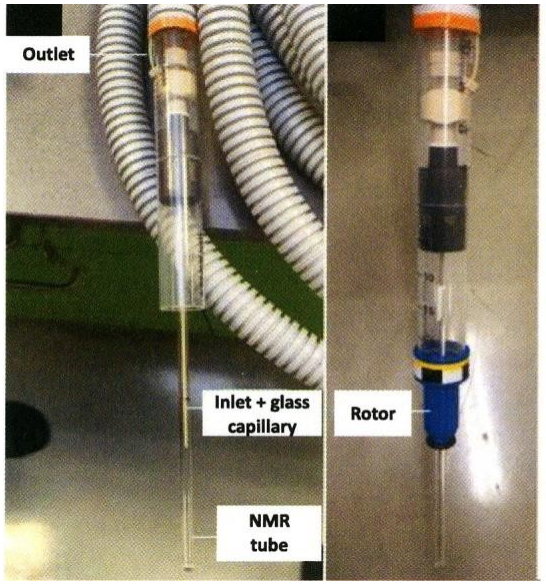


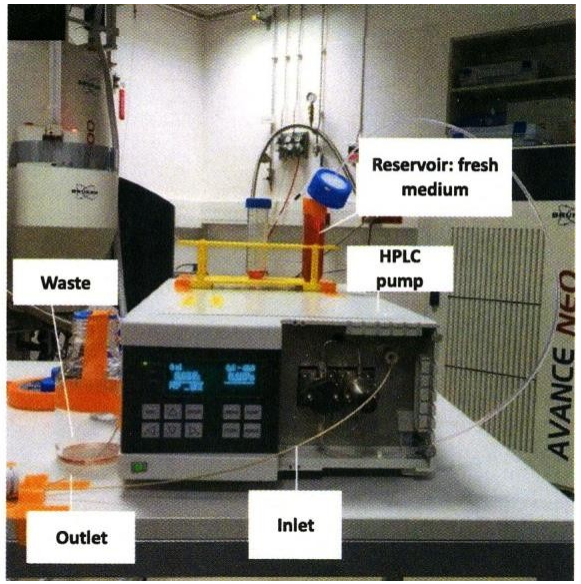
CEITEC

New equipment

Supplementary equipment for in-cell NMR (bioreactor)

- Pipeline for preparation in-cell NMR samples
- (laminar flow cabinet, centrifuge, electroporator)





- **Frascan** II
  - Combined EPR/NMR
  - system for hyperpolarized NMR experiments
  - Collaboration with Neugebauer RG, CEITEC BUT



CEITEC

Access, Training, Data policy

- **Access: User or service mode**
- User mode – trained users only
- **Training**
  - Practical NMR Spectroscopy of Biomolecules (C7995)
    Non-students/outside users welcome
  - Experienced NMR spectroscopist can get certified based on their previous experience/publications.
- **Advanced training –** specialized workshops every 6 month
  - Protein NMR
  - NMR of nucleic acids
  - NMR spectra processing
  - Solid state NMR

Financial support

CIISB (Czech, world)

https://www.ciisb.org/open-access/proposal-submission

INSTRUCT (EU)

https://instruct-eric.org/submit-proposal

Monitoring system

https://nmrinfo.ncbr.muni.cz/nmr/monitoring/

Data policy

Users shall work under their own logins

Users are owners of their data,

No permanent storage in the CF (quotas)

Data backed up every night

Acknowledgement text – CIISB

- **Preferred version:** *„CIISB, Instruct-CZ Centre of Instruct-ERIC EU consortium, funded by MEYS CR infrastructure project LM2023042 and European Regional Development Fund-Project „Innovation of Czech Infrastructure for Integrative Structural Biology“ (No. CZ.02.01.01/00/23_015/0008175), is gratefully acknowledged for the financial support of the measurements at the Josef Dadok National NMR Centre.“*

- **Short version:** *„We acknowledge Josef Dadok National NMR Centre of CIISB, Instruct-CZ Centre, supported by MEYS CR (LM2023042) and European Regional Development Fund-Project „Innovation of Czech Infrastructure for Integrative Structural Biology“ (No. CZ.02.01.01/00/23_015/0008175).”*

- *Co-authorship (creative input, substantial contribution)*

Selected publications

POSTER

Chemical Science

ROYAL SOCIETY OF CHEMISTRY

EDGE ARTICLE

Published on 04 March 2026

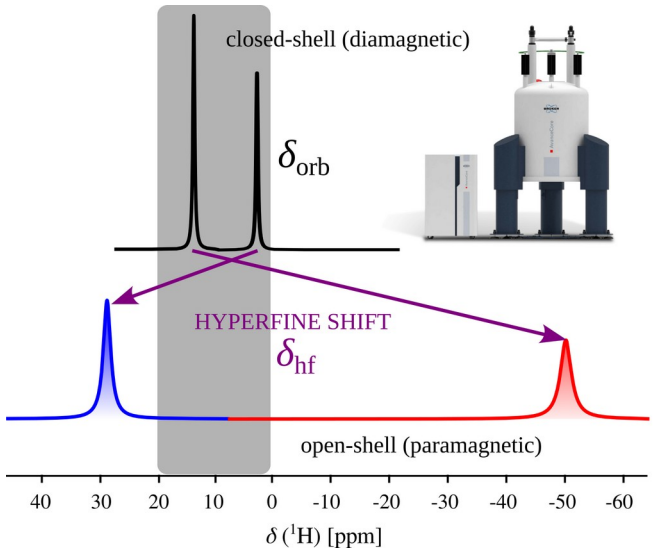
Check for updates

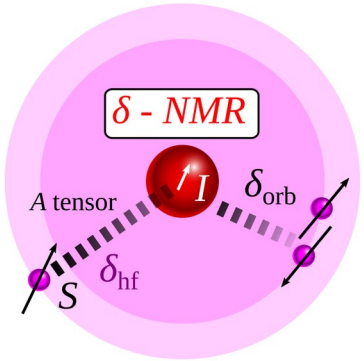
Cite this: *Chem. Sci.*, 2026, **17**, 9042

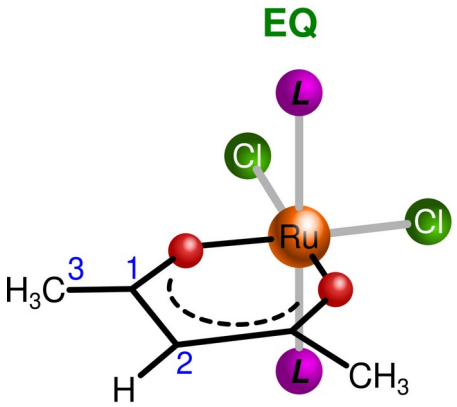
All publication charges for this article have been paid for by the Royal Society of Chemistry

Unraveling the coordination isomerism by ligand hyperfine NMR shifts

Dora Cidlinská,†[ab] Jan Chyba,†[ab] Markéta Munzarová,[b] Yevgen Yurenko,[a] Jan Novotný *[abc] and Radek Marek *[abc]

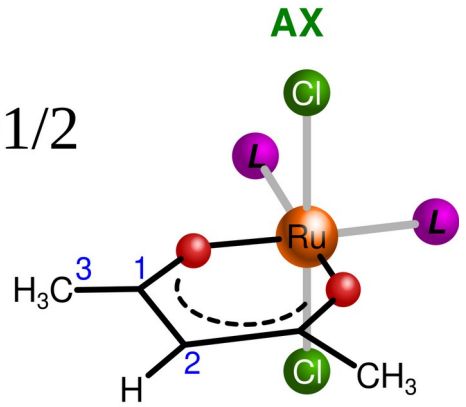






cis-Cl

Ru(III) S=1/2



trans-Cl

Figures copied from the article cited above them.

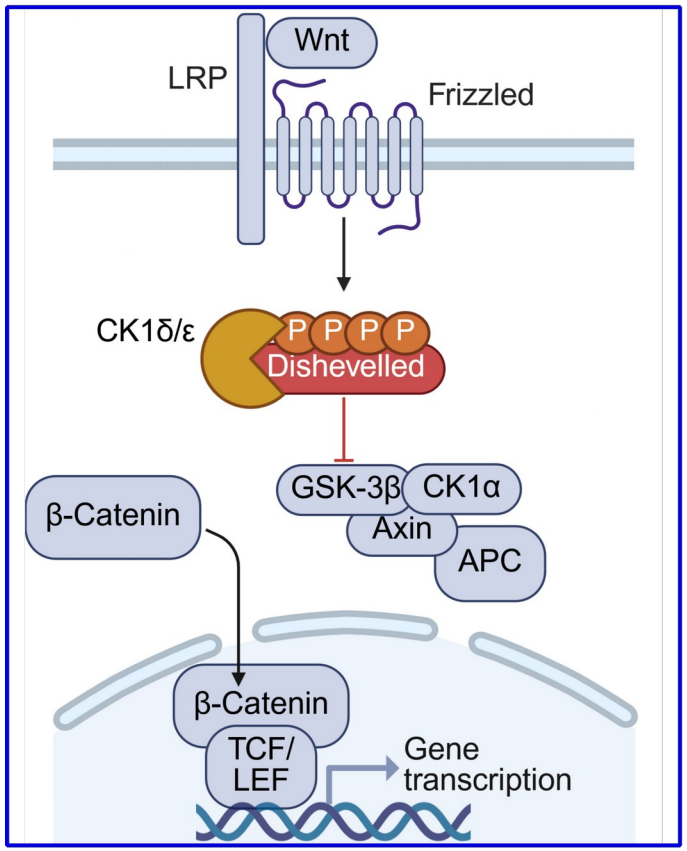
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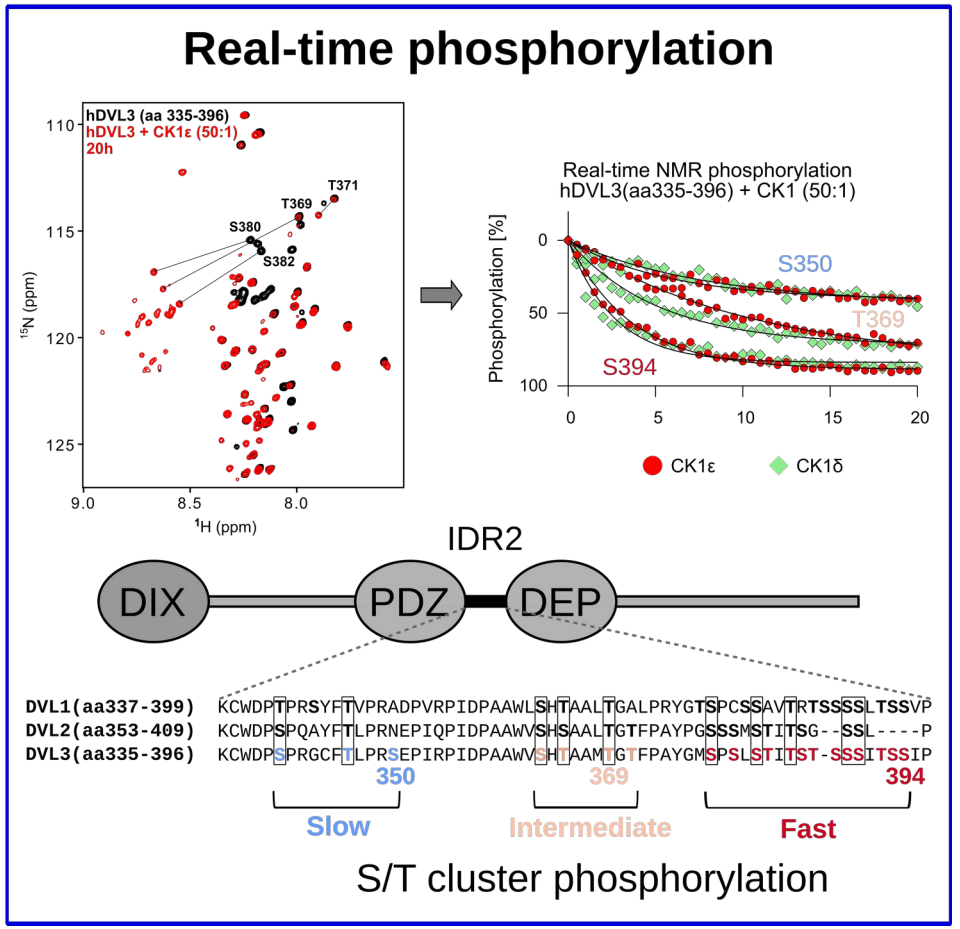
SIGNAL TRANSDUCTION

A Wnt-induced conformational phospho-switch in DVL3 controls association with Frizzled receptors and Wnt/β-catenin signaling

Miroslav Micka[1,2], Jitender Kumar[2], Petra Padíková[1], Zuzana Hayek[1,2], Kateřina Hanáková[2], Cherine Bechara[3,4], Hana Plešingerová[1,5], Ondrej Šedo[2], Sara Bologna[2], Elise Del Nero[3], Kristína Gömöryová[1], Vojtěch Bystrý[2], Tomáš Gybel[1], Tereza Číhalová[1], Marek Kravec[1], David Potěšil[2], Zbyněk Zdráhal[2], Konstantinos Tripsianes[2]*, Vítězslav Bryja[1]*

POSTER





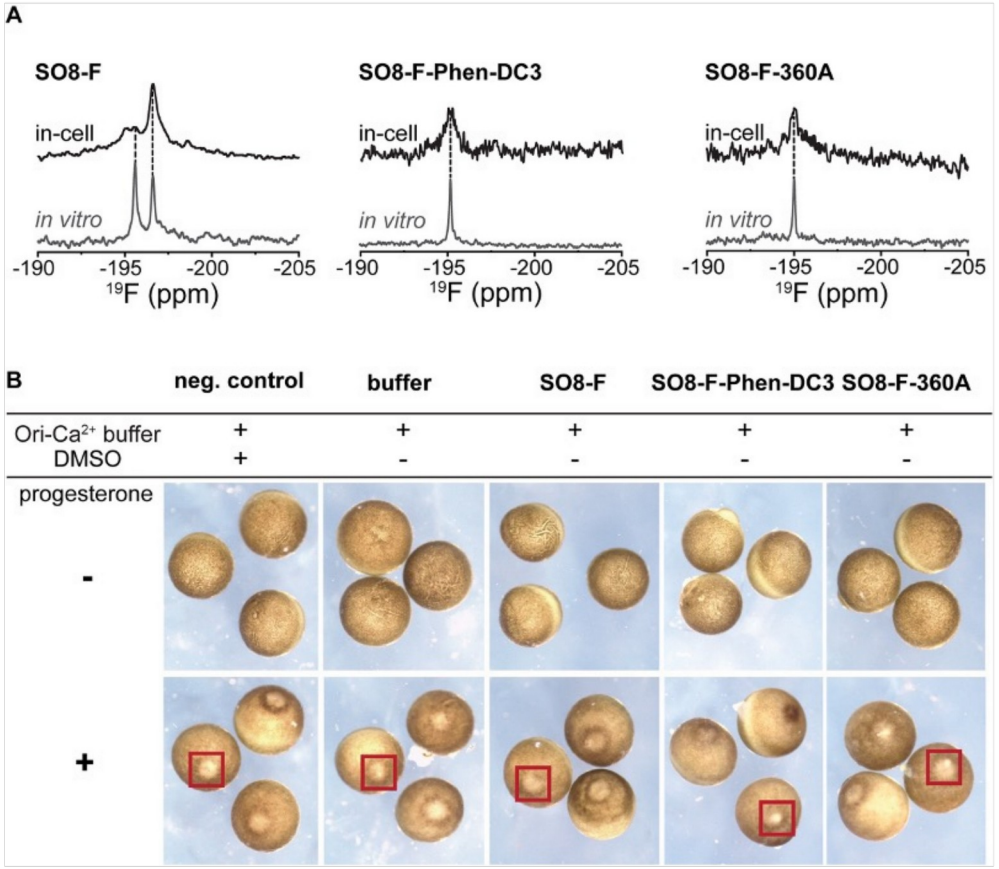
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Nucleic Acids Research, 2025, **53**, gkaf894
https://doi.org/10.1093/nar/gkaf894
Molecular and Structural Biology

Structural basis of bis-quinolinium ligands binding to quadruplex–duplex hybrids from *PIM1* oncogene

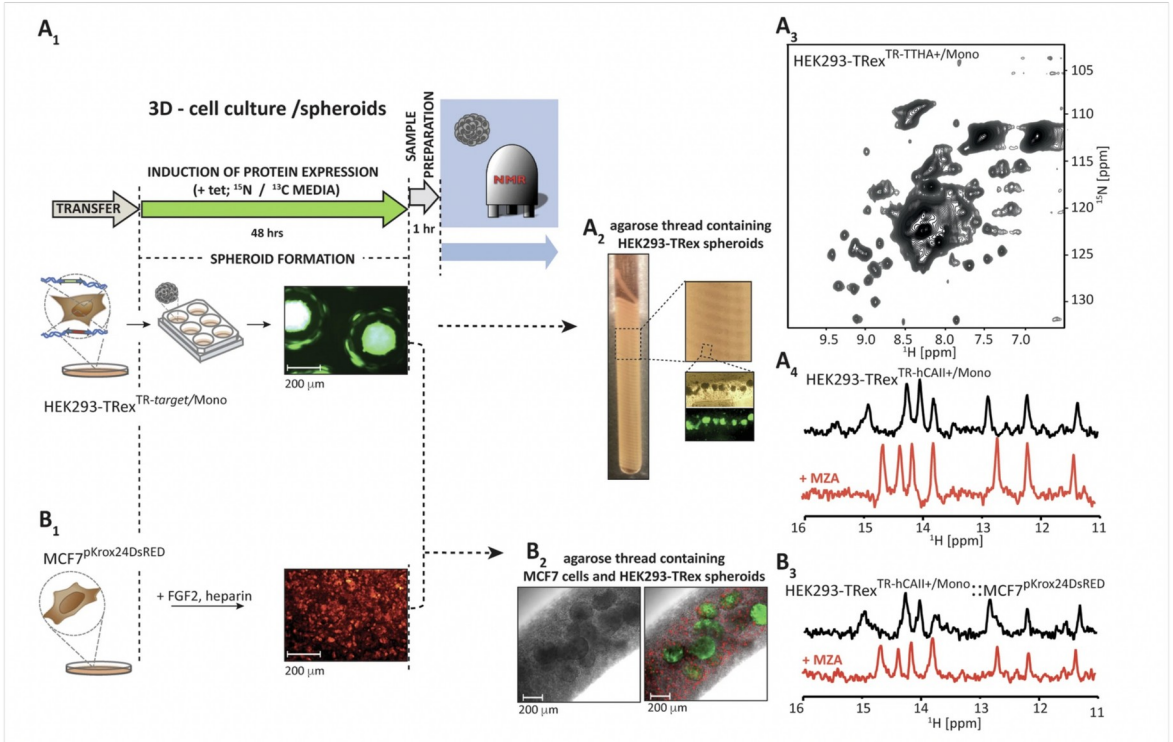
Anirban Ghosh[1,*], Jakub Hamos[2], Petr Stadlbauer[3,4], Jiri Sponer[3,5], Martina Lenarcic Zivkovic[6,*], Lukas Trantirek[1,*]



communications biology
A Nature Portfolio journal
Article
Communications Biology | (2025)8:194
https://doi.org/10.1038/s42003-025-07607-w

Protein structure and interactions elucidated with in-cell NMR for different cell cycle phases and in 3D human tissue models

Jan Rynes[1,8], Eva Istvankova[1,8], Michaela Dzurov Krafcikova[1,8], Enrico Luchinat[2,3], Letizia Barbieri[2], Lucia Banci[2,3], Kristyna Kamarytova[1], Tomas Loja[1], Bohumil Fafilek[4,5,6], Gustavo Rico-Llanos[4,6], Pavel Krejci[4,5,6], Libor Macurek[7], Silvie Foldynova-Trantirkova[1] ✉ & Lukas Trantirek[1] ✉



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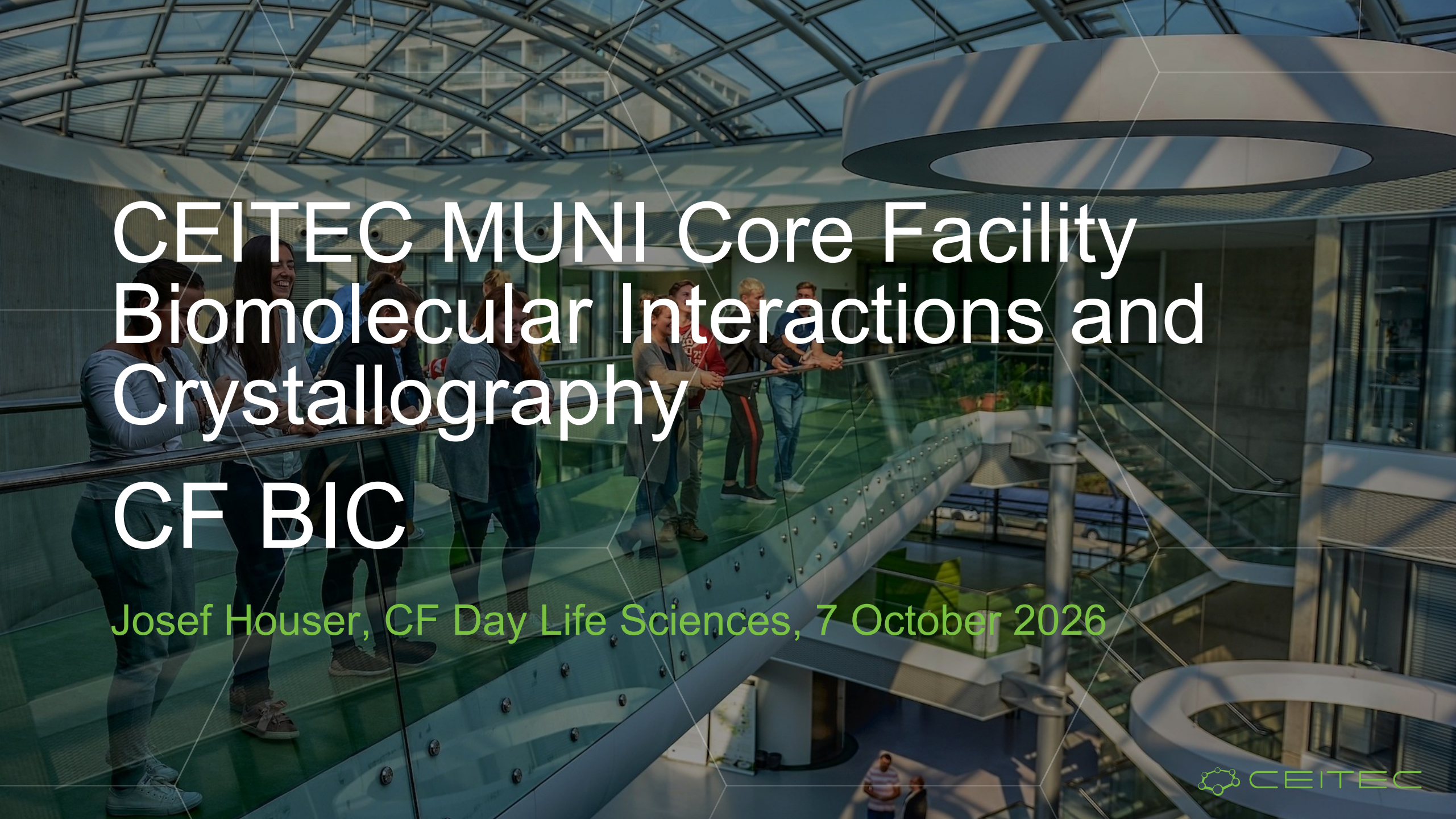
Thank you for your attention!
Questions?

Building C04

nmr@ceitec.muni.cz

https://nmr.ceitec.cz

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CEITEC MUNI Core Facility Biomolecular Interactions and Crystallography

CF BIC

Josef Houser, CF Day Life Sciences, 7 October 2026

CEITEC

Expertise

20 techniques with 30 instruments

- Studies of physical properties of the molecules,
  e.g. size distribution, homogeneity, stability, structural content
- Characterization of (bio)molecular interactions including thermodynamics and/or kinetics parameters
- High-throughput crystallization screening and optimization of conditions for a crystal growth
- X-ray diffraction and 3D structure solving
- In-cell protein production and purification

Biophysical characterization

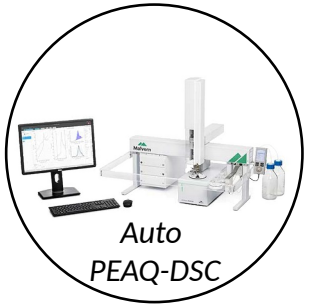
- Homogeneity
  - Molecular mass
  - Oligomeric state
  - Aggregation
- Stability
  - Temperature
  - Buffer composition
- Folding
  - Secondary structure
  - Shape

- Analytical ultracentrifugation (AUC)
- Size exclusion chromatography (SEC-LS)
- Dynamic light scattering (DLS)
- Differential scanning fluorimetry (DSF)
- Differential scanning calorimetry (DSC)
- Circular dichroism spectroscopy (CD)
- Small-angle X-ray scattering (SAXS)
- Mass photometry (MP)
- UV/VIS spectroscopy


Optima AUC

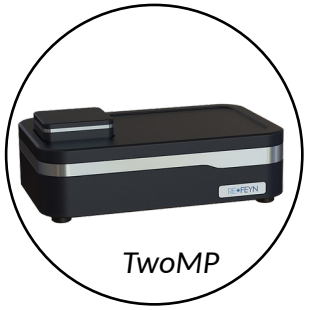

ProteomeLab XL-I

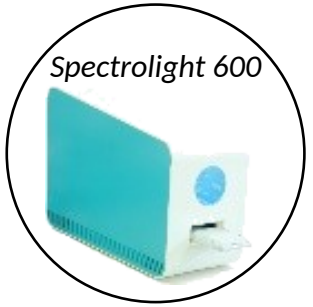

Chirascan V100

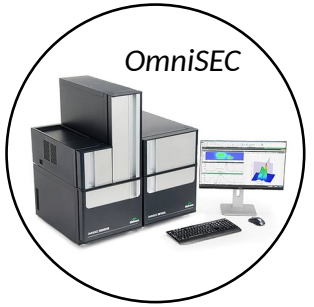

Auto PEAQ-DSC

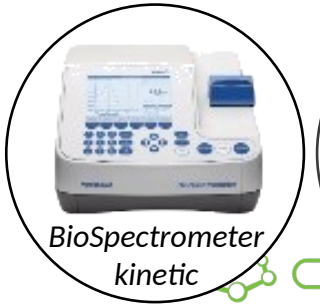

DelsaMAX


Prometheus NT.48


TwoMP


Spectrolight 600


OmniSEC


BioSpectrometer kinetic


BioSAXS 2000

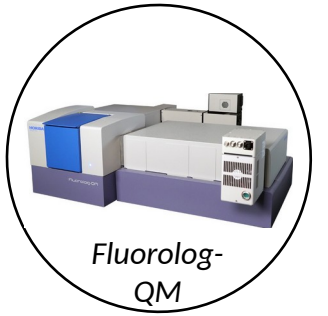
Biomolecular interactions

- Various principles
  - In solution
  - On surface
  - Cell-based
- Parameters
  - Affinity
  - Thermodynamics
  - Kinetics
- Types of molecules
  - Proteins, nucleic acids, small molecules

- Isothermal titration calorimetry (ITC)
- Micro-scale thermophoresis (MST)
- Bio-layer interferometry (BLI)
- Surface plasmon resonance (SPR)
- Analytical ultracentrifugation (AUC)
- Fluorescence anisotropy (FA)
- Cell sorting (FACS)


Optima AUC


ProteomeLab XL-I


Fluorolog-QM


Monolith NT.117


Auto PEAQ-ITC


Biacore S200


Octet RED96e


Monolith NT.117 Pico




SPR imaging

Crystallography

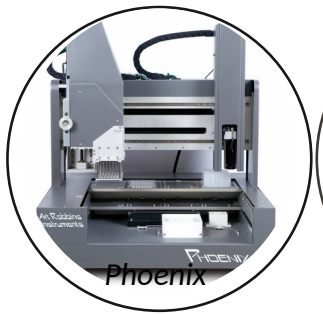
- Complete instrumentation for crystallization screening
- Optimization of crystallization
- Diffraction data collection
- 3D structure determination

- Crystallization plates set-up robotics
- Plates storage and imaging
- Crystallization temperature optimization
- Optical microscopes
- X-ray diffraction
- Accessories for cryo-crystallography





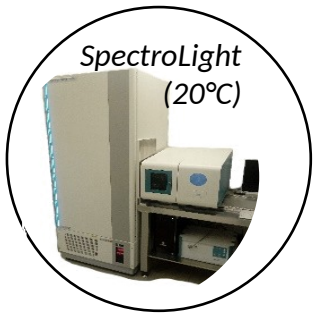


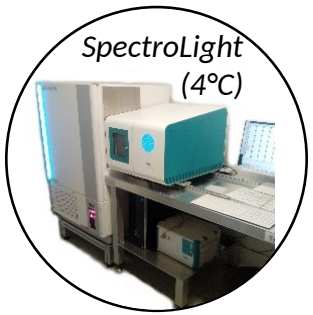


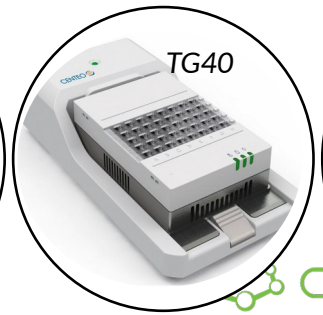










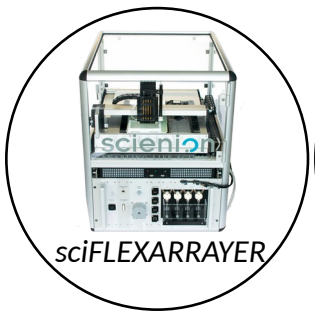




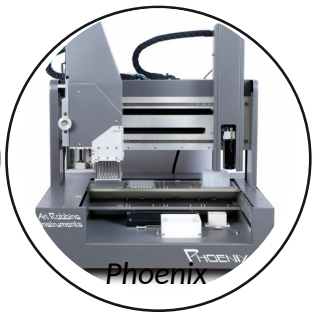
High throughput

- Robotization and automation for HTS
- Pipetting from 500 pl to 1 ml
- Microarrays
- 96 and 384-well plates handling
  - Aliquoting
  - Gradient preparation

- Parallelization
  - In plates – DLS, BLI, crystallization
  - In capillaries – DSF
- Autosamplers
  - Walk-away operation, 24/7
  - SPR, ITC, DSC, SEC-LS
- Pipetting robotics
  - SBS plate preparation
  - Microarrays

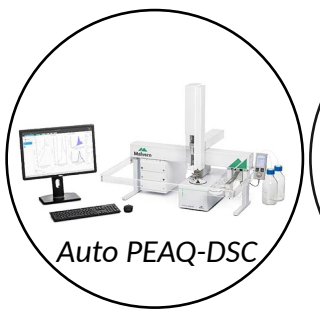










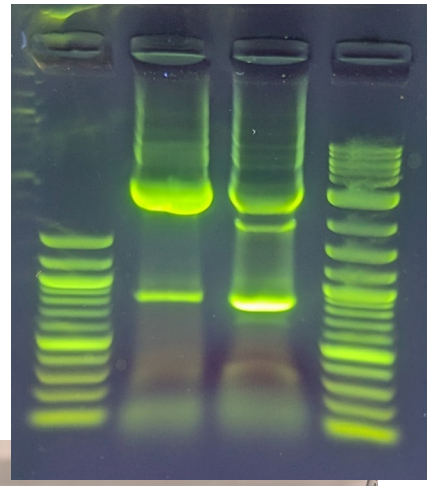


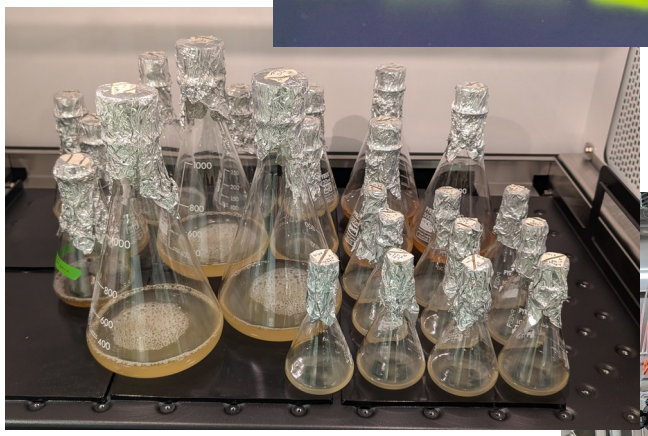




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Protein production







Complete pipeline from sequence to protein

- Assistance with expression system design
- Various production systems
  - Prokaryotic – *E. coli*
  - Eukaryotic – SF9 insect cells
- Solubility screening
- Protein purification
  - Affinity chromatography
  - Size-exclusion chromatography
  - Purification on beads
- Sample quality control – identity, homogeneity, size

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Case study: 14-3-3ζ protein

- Important **human regulatory protein**
- Various roles in organism
- **Monomer-dimer transition** depending on phosphorylation

Phosphomimicking mutants

ζ_S58E

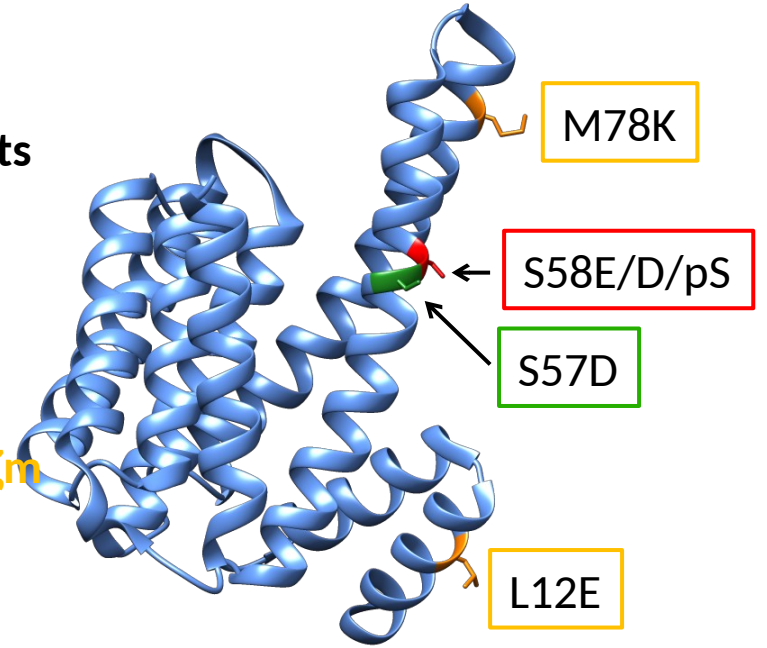
ζ_S58D

ζ_S57D_S58D

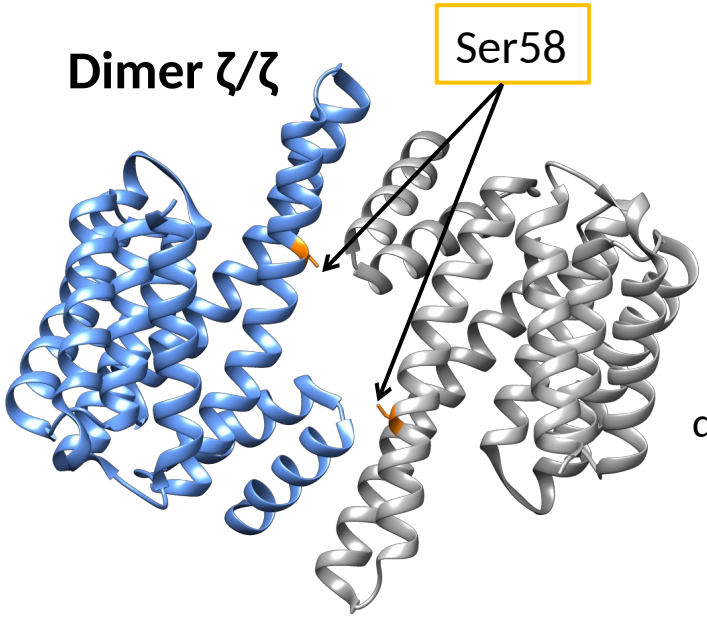
Monomeric mutants

ζ_L12E_M78K = ζm

Phosphorylated ζ_pS58



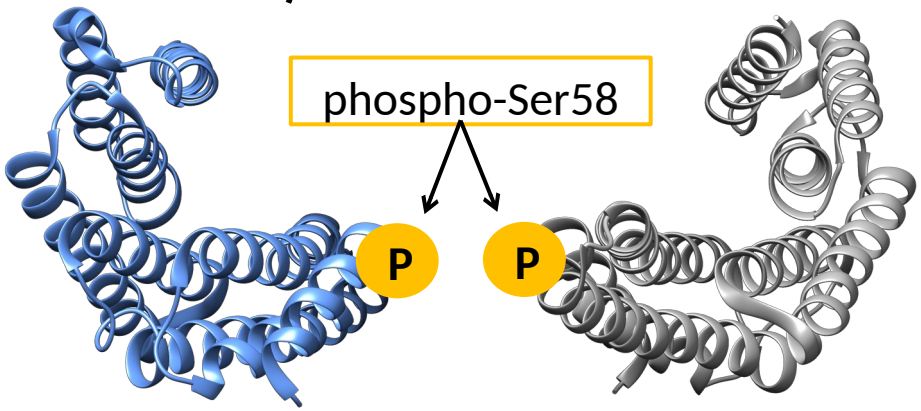
Dimer ζ/ζ



phosphorylation

dephosphorylation

Pζ Monomers





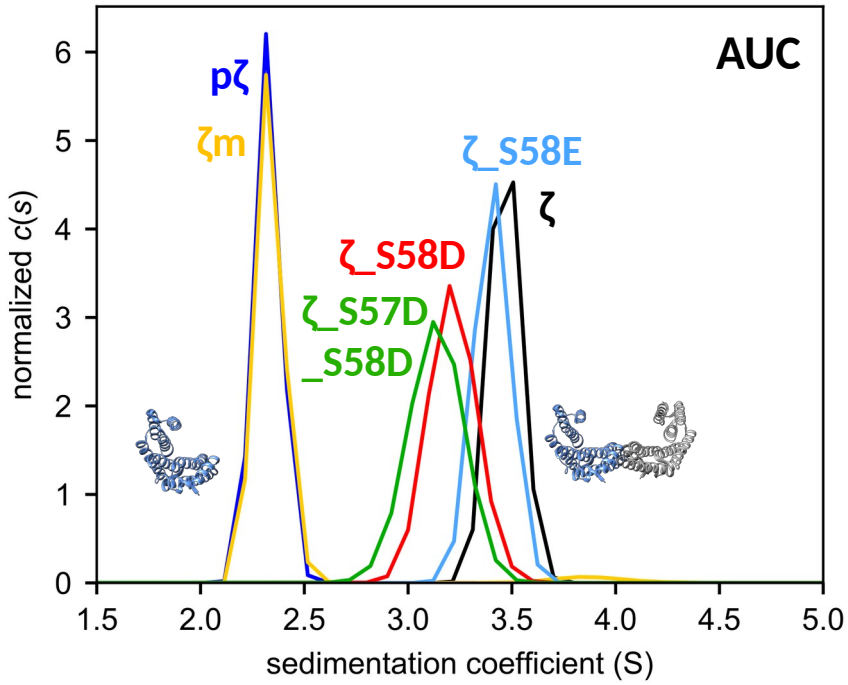
Jozef Hritz

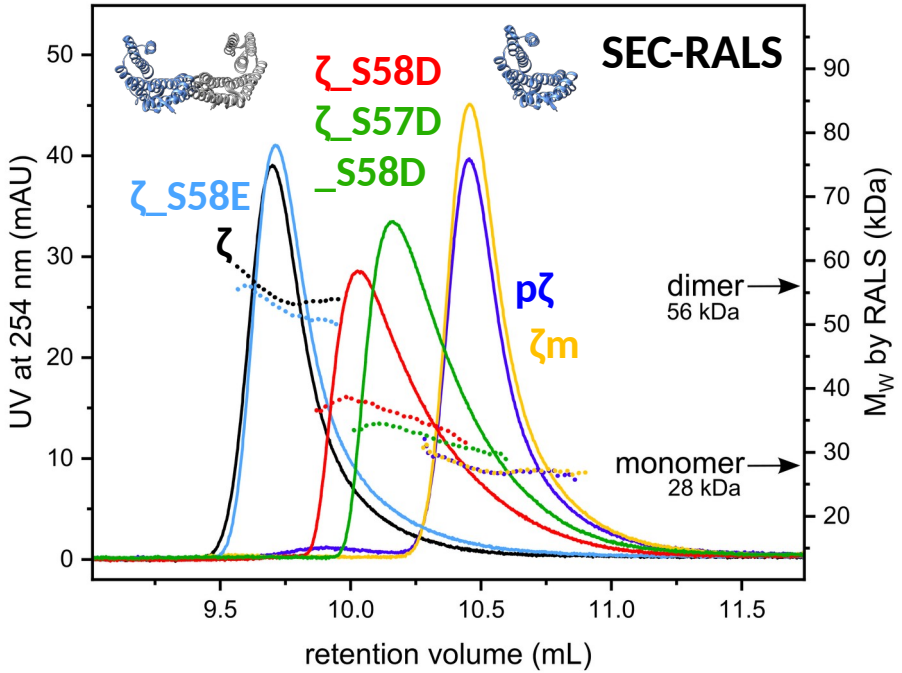
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Case study: 14-3-3ζ protein

- Combination of multiple methods
- FRET, MST, AUC, SEC-LS, nanoDSF, DSC
- **High-variability** among "phosphor-mimicking" mutations (K_D varies by 4 orders)

14-3-3 construct	K_D (AUC/SEC)	T_m (nanoDSF) [°C]	T_m (DSC) [°C]
ζ_WT	5.5 ± 0.8 nM	60.35 ± 0.15	60.28 ± 0.01
ζ_S58E	0.35 ± 0.25 µM	58.19 ± 0.09	57.64 ± 0.01
ζ_S58D	132 ± 7 µM	54.21 ± 0.03	53.89 ± 0.01
ζ_S57D_S58D	348 ± 19 µM	53.58 ± 0.10	53.70 ± 0.01
ζm	4.6 ± 0.1 mM	53.04 ± 0.12	53.34 ± 0.02
ζ_pS58	7.6 ± 0.8 mM	50.70 ± 0.11	50.88 ± 0.02





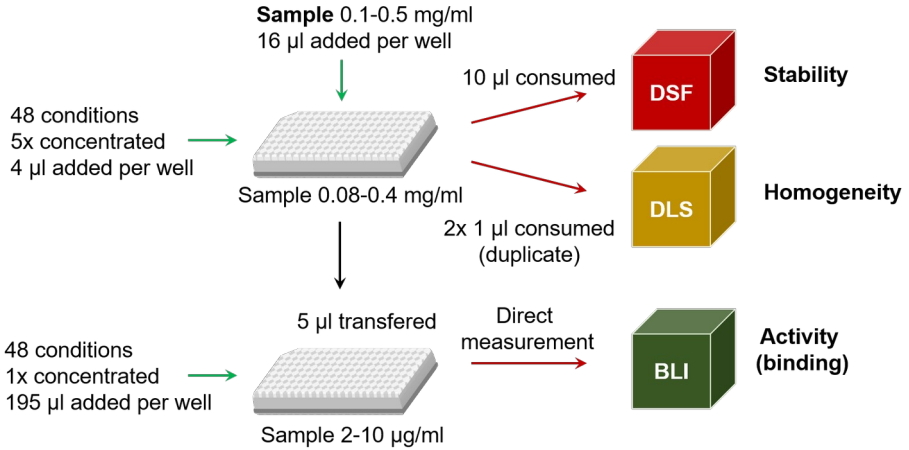
Kozeleková *et al.*, **2022**, *Front Chem*

Case study: Buffer optimization

It is hard to make protein „happy“

- Incorrect pH
- High/low salt content
- Interfering components

In-house developed buffer screen





European Biophysics Journal
https://doi.org/10.1007/s00249-021-01497-6

ORIGINAL ARTICLE

Development of 48-condition buffer screen for protein stability assessment

Josef Houser[1,2] · Jana Kosourova[1] · Monika Kubickova[1] · Michaela Wimmerova[1,2,3]

Received: 28 September 2020 / Revised: 22 December 2020 / Accepted: 7 January 2021
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Abstract
The determination of a suitable buffer environment for a protein of interest is not an easy task. The requirements of advanced techniques, the demands on the biological material and the researcher time needed for buffer optimization, as well as personal inflexibility, lead frequently to the use of sub-optimal buffers. Here, we demonstrate the design of a 48-condition buffer screen that can be used to determine an appropriate environment for downstream studies. By the combination of several techniques (differential scanning fluorimetry, dynamic light scattering, and bio-layer interferometry), we are able to assess the protein stability, homogeneity and binding activity across the screen with less than half a milligram of protein in 1 day. The application of this screen helps to avoid unsuitable conditions, to explain problems observed upon protein analysis and to choose the most suitable buffers for further research. The screen can be routinely used as a primary screen for buffer optimization in labs and facilities.

Keywords Protein stability · Buffer · Screening · Differential scanning fluorimetry · Dynamic light scattering · Bio-layer interferometry

Introduction
The vast majority of processes in living organisms require a water-based environment. This applies not only to enzymatic reactions but to biomolecular interactions in general. Since the experimental work in a natural environment, such as cell cytoplasm or body fluids, faces multiple complications (complexity of the solution, non-repeatability of experiments, inaccessibility of material, price), most of the experiments are conducted in a defined environment—a buffer (Stoll and Blanchard 2009). The buffer is a solution that usually contains up to four kinds of molecules: water as a solvent, buffering substance (weak acid or base) maintaining desired pH, salt for ionic strength adjustment and additives for specific purposes.

While the simplicity of the used buffer is highly advantageous over the complex natural environment, it is known that individual macromolecules may act differently in different environments. Some of them even require quite strict conditions for their function (Sambrook and Russell 2001; Ferreira et al. 2015). Therefore, the use of a single buffer for all purposes is not reasonable. Commonly used buffers, e.g., the phosphate-buffered saline (PBS) at pH 7.4, combine the so-called physiological neutral pH and isotonic osmotic pressure. However, it was shown in many cases that PBS is not entirely suitable buffer for particular purposes (Blanchard 1984). On the other hand, it is not possible to perform each experiment in numerous buffers, especially in case of demanding techniques, such as cryo-electron microscopy, X-ray diffraction, and nuclear magnetic resonance. As a compromise, a search for an "optimal" buffer for molecule(s) of interest is usually done, focusing mainly on macromolecular stability and activity.

There exists a number of commercially available buffer screens nowadays (Vedadi et al. 2006; Boivin et al. 2013;

Special Issue: COST Action CA15126, MOBIEU: Between atom and cell.

Josef Houser
houser@mail.muni.cz

1 Central European Institute of Technology, Masaryk University, Kamenice 5, 625 00 Brno, Czech Republic
2 National Centre for Biomolecular Research, Faculty of Science, Masaryk University, Kamenice 5, 625 00 Brno, Czech Republic
3 Department of Biochemistry, Faculty of Science, Masaryk University, Kamenice 5, 625 00 Brno, Czech Republic

Houser *et al.*, **2021**, *Eur Biophys J*

	1	2	3	4	5	6	7	8	9	10	11	12
A	Ref	Broad pH range (2-12)										
B	Detailed pH range (4-9.5)											
C	Ionic strength (100-1000 mM at pH 6, 7, 8)											
D	Common buffers						Additives					

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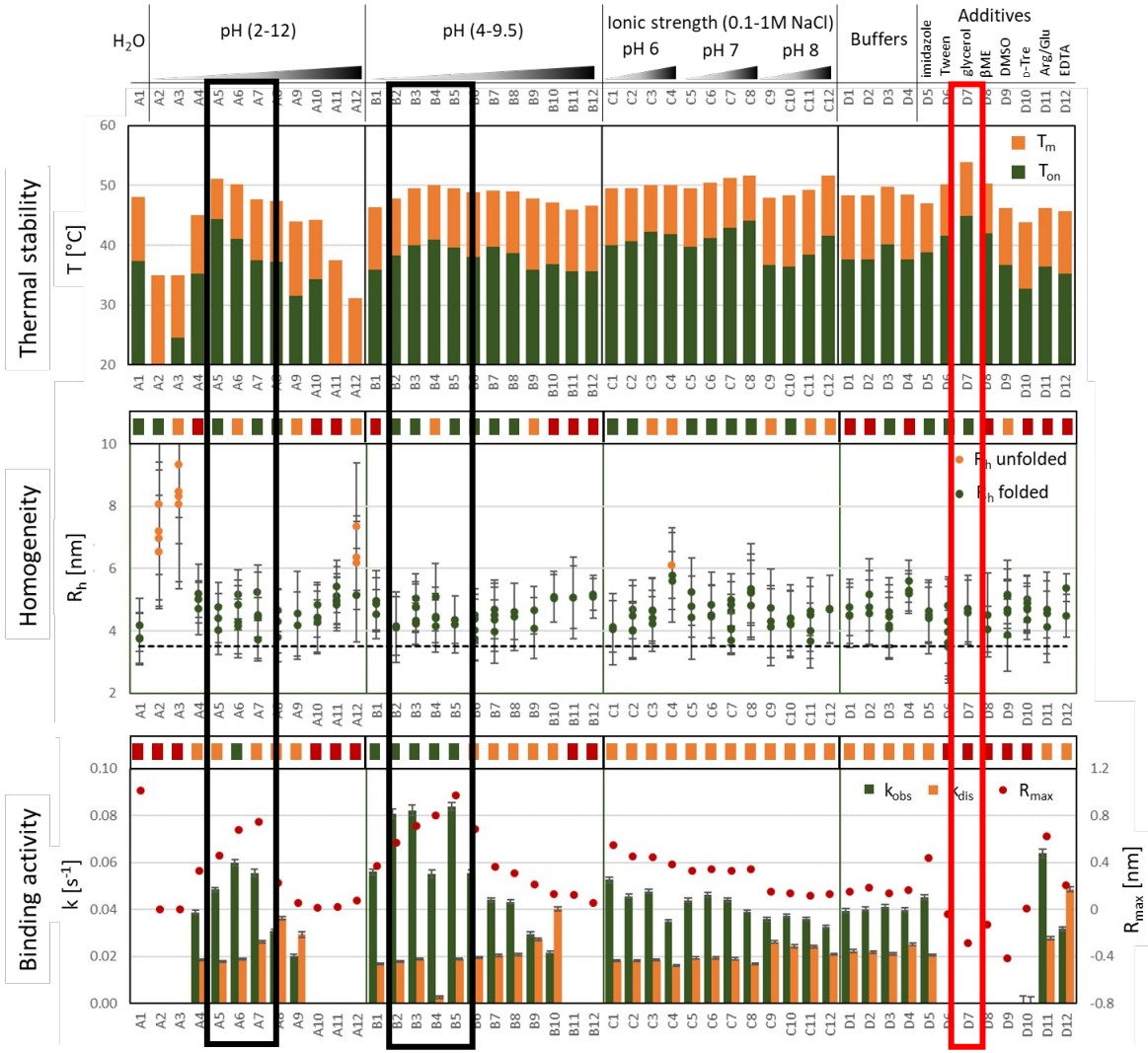
Case study: Buffer optimization

- Broad application range:
  - Temperature stability
  - Prevention of aggregation
  - Storage conditions
  - Activity optimum
  - Purification adjustment
  - …
- Avaliable as **ready-to-go aliquots**

DSF

DLS

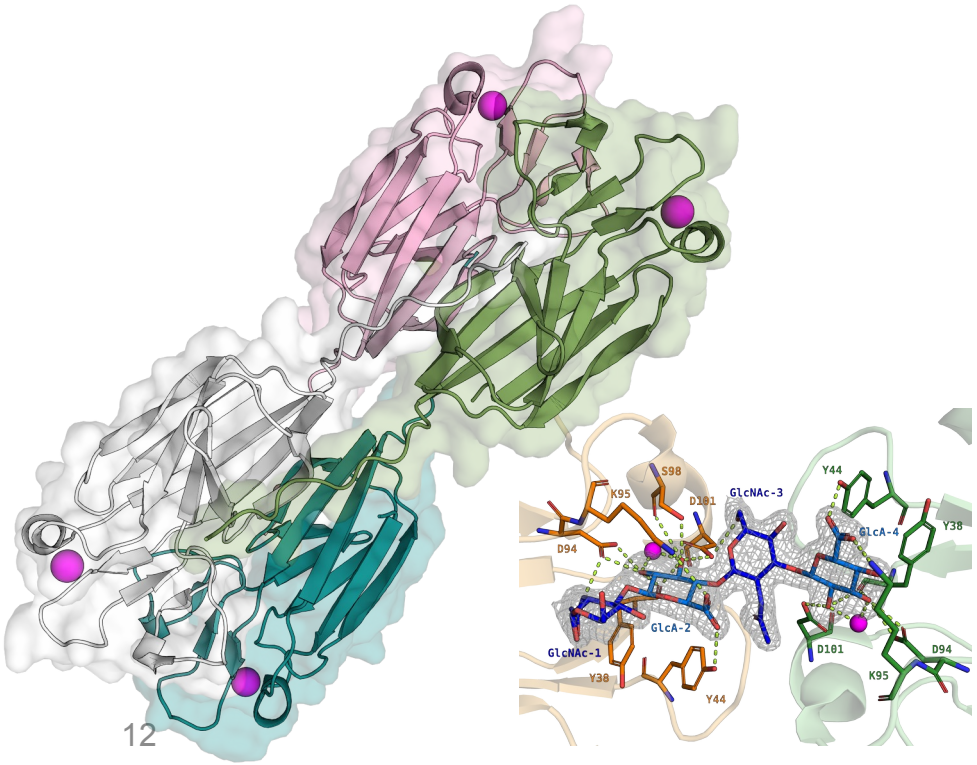
BLI

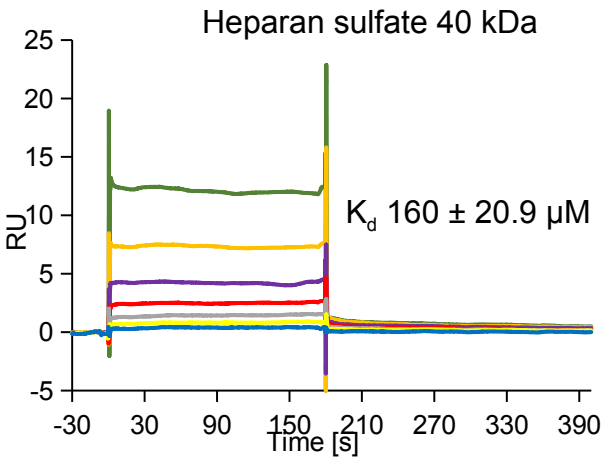


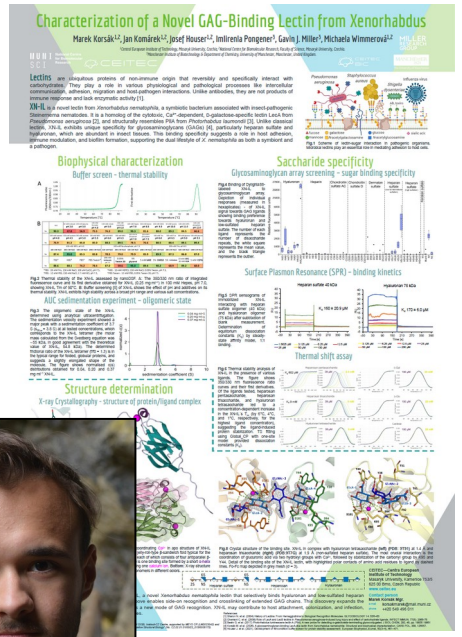
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Case study: GAG-binding lectin

- Novel lectin from *Xenorhabdus* sp.
- Specific binding of **glycosaminoglycans**
- Potential for **biotechnology applications**

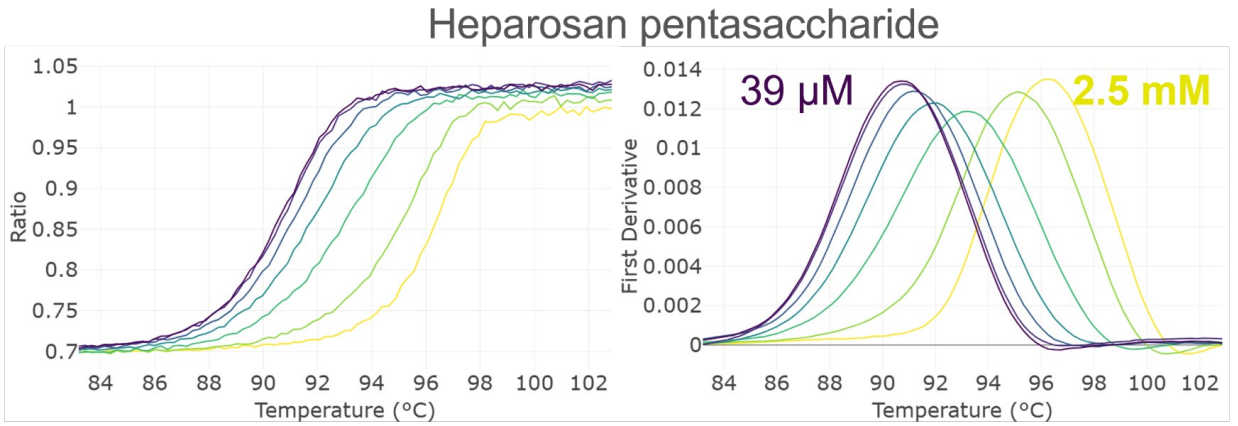








Poster by Marek Korsák



CEITEC

How to use CF BIC?

- CF BIC is **opened to everyone**
- Majority of users from CEITEC and Masaryk University

Modes of access

- Service mode
- User mode

Pricing

- Full prices – based on cost matrix
- **Reduced fee** – national/international projects
- Collaboration – specific cases

- Compliance with CF BIC rules required

- Acknowledgement obligatory

Upcomming workshops

- Surface plasmon resonance workshop
  - Co-organized with Cytiva
  - Lectures and practicals on SPR applications

8 – 9 Dec 2026

- Methods for Characterization of Biomolecular Interactions
  - Lectures on various biophysical techniques
  - Hands-on sessions for students/selected participants
  - Available to students as subject S2004/S2005

18 – 22 Jan 2027

Check **bic.ceitec.cz** and **CEITEC newsletters** for more information

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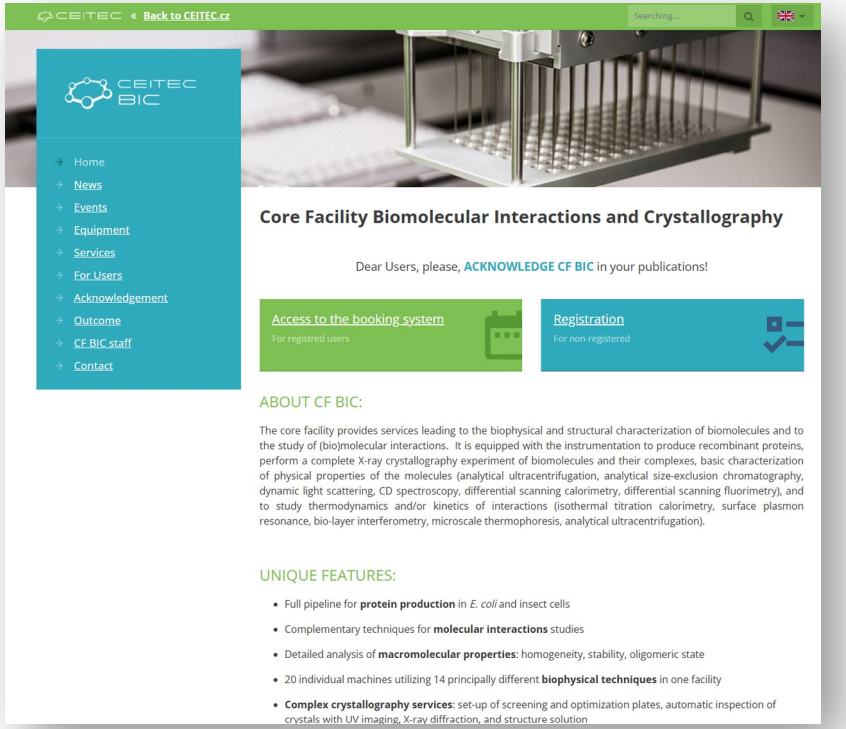
CF BIC

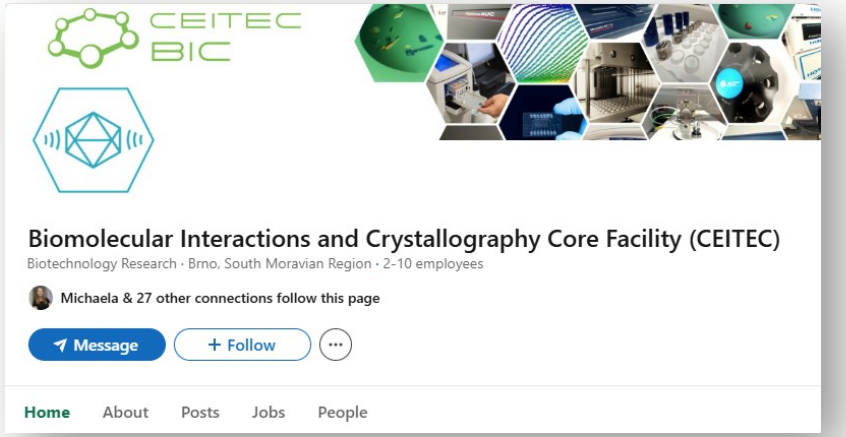
http://bic.ceitec.cz

CF Head: Josef Houser (C04/339)

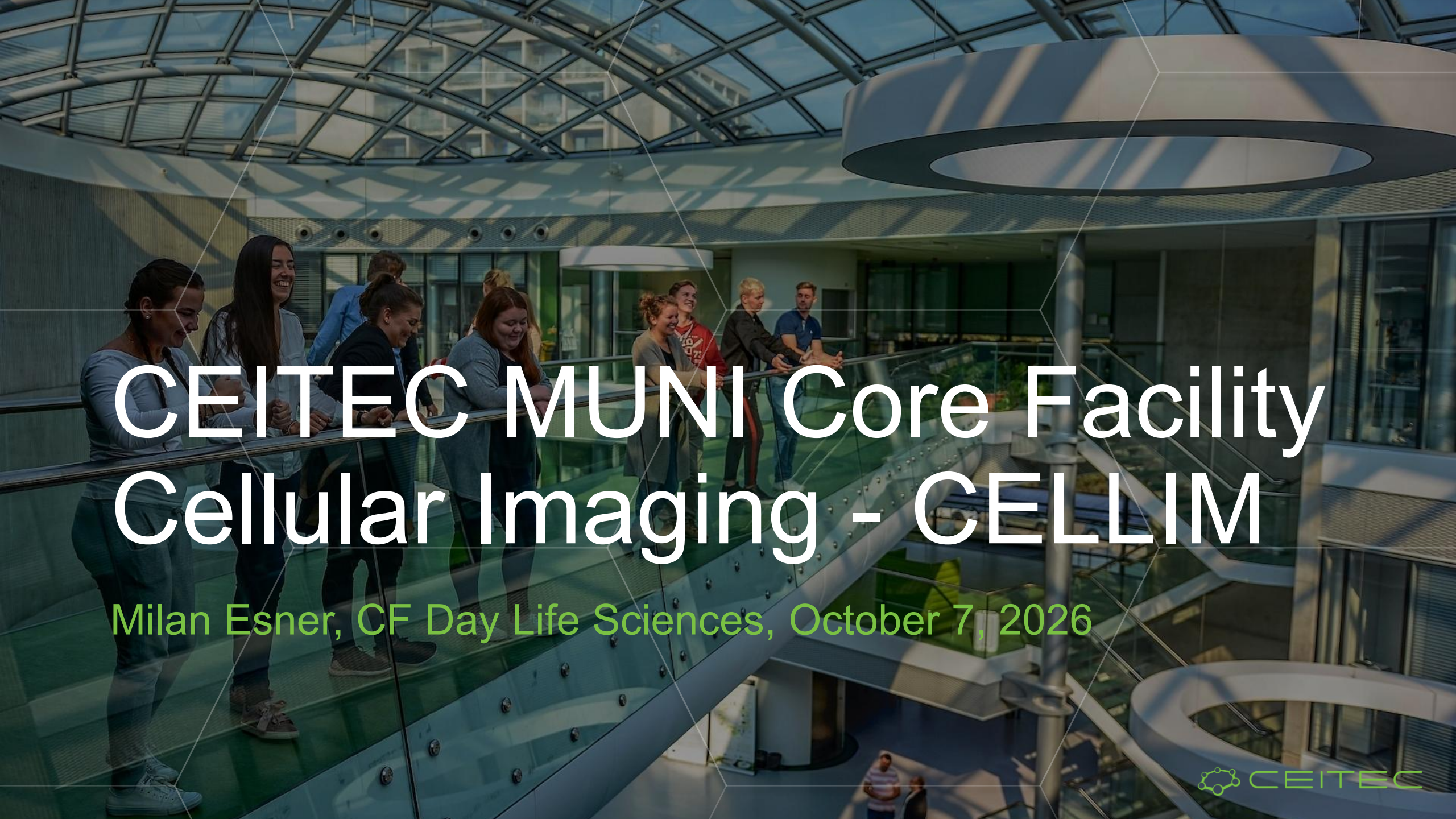
Contact e-mail: **bic@ceitec.cz**








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Institute of Technology
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CEITEC MUNI Core Facility Cellular Imaging - CELLIM

Milan Esner, CF Day Life Sciences, October 7, 2026

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CELLIM - Cellular Imaging

SCAN ME

CZECH BIOIMAGING

- **Expertise:**
  - Widefield, confocal, super-resolution, lightsheet microscopes and image analysis tools;
  - Training of users in sample preparation, image acquisition and data analysis;
  - Project design and assistance in planning of experiments.
- **Key Equipment:**
  - Stereo & zoom microscopes;
  - Widefield microscopes, optical sectioning modules Apotome for widefield 3D;
  - Confocal microscopes (laser scanning, spinning disc with FRAP/photo-activation unit);
  - Fluorescence lifetime microscopy (FLIM), total internal reflection fluorescence (TIRF);
  - Super-resolution microscopes – Airyscan, lattice SIM, SMLM;
  - Lightsheet microscope;
  - Image processing server with commercial and open-source tools.
- **Mode: User mode (prior training needed)**
- **Web:** CELLIM Cellular Imaging Core Facility
- **Contact:** cellim@ceitec.muni.cz

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Office: Kamenice 753/5, Brno, 625 00, office C02/118

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Cellular Imaging Core Facility - CELLIM

CZECH BIOIMAGING

EURO BIOIMAGING

CZECH REPUBLIC



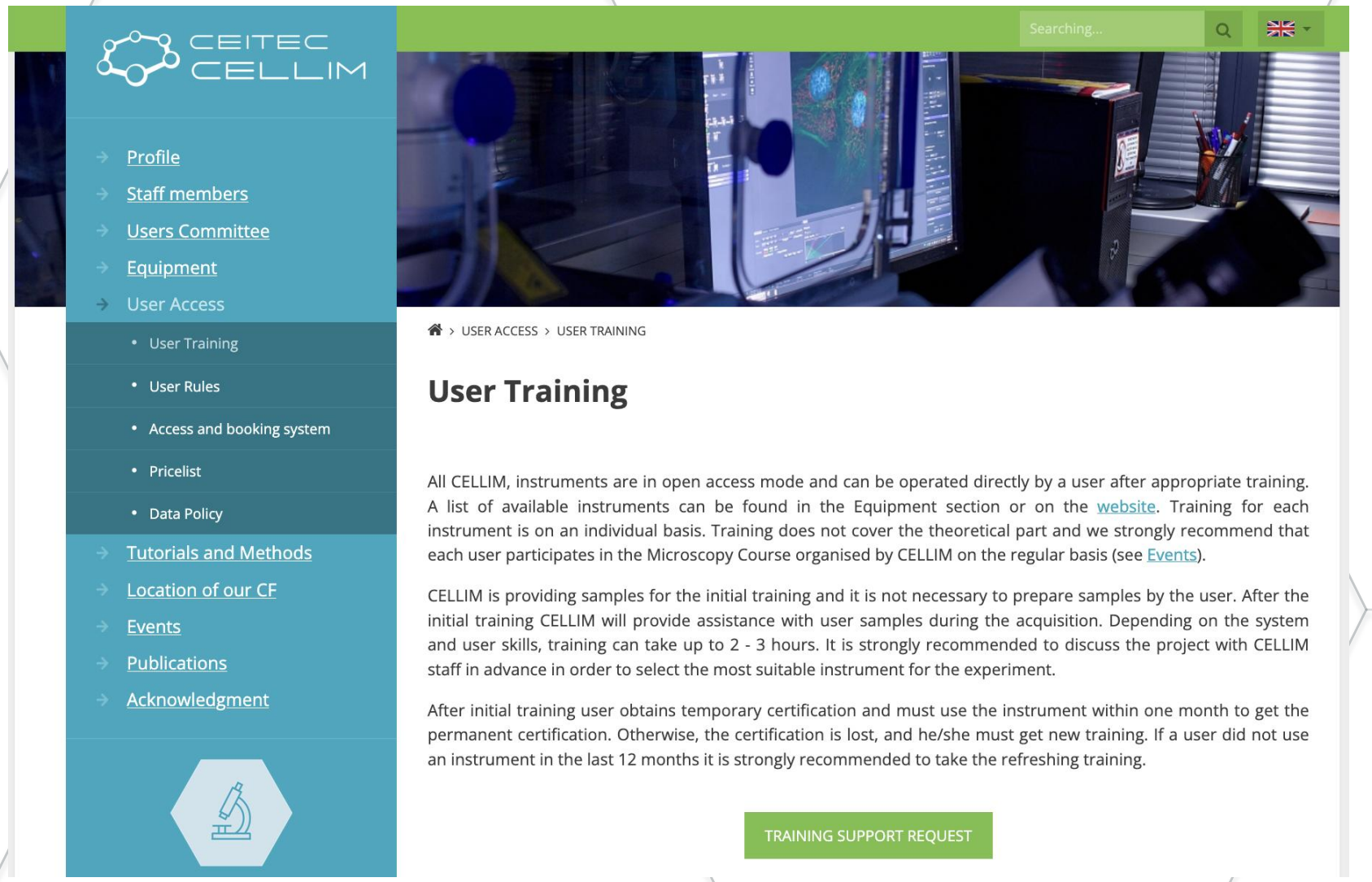
Advanced Light Microscopy and Medical Imaging Node Brno CZ

Cellular Imaging Core Facility - Ceitec MU
Multimodal and Functional Imaging Laboratory – Ceitec MU
Experimental Biophotonics Facility – Ceitec BUT
Centre of BioImage Analysis, Faculty of Informatics MU
Magnetic Resonance and Cryogenics, Institute of Scientific Instrumentation CAS
Electron microscopy facility, Institute of Scientific Instrumentation CAS

https://www.eurobioimaging.eu/

Cellular Imaging – how to contact us!

CZECH BIOIMAGING



cellim_support@ceitec.muni.cz cellim@ceitec.muni.cz milan.esner@ceitec.muni.cz

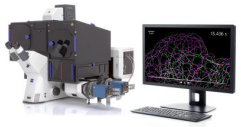
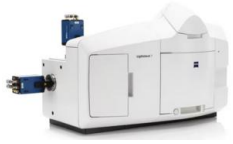
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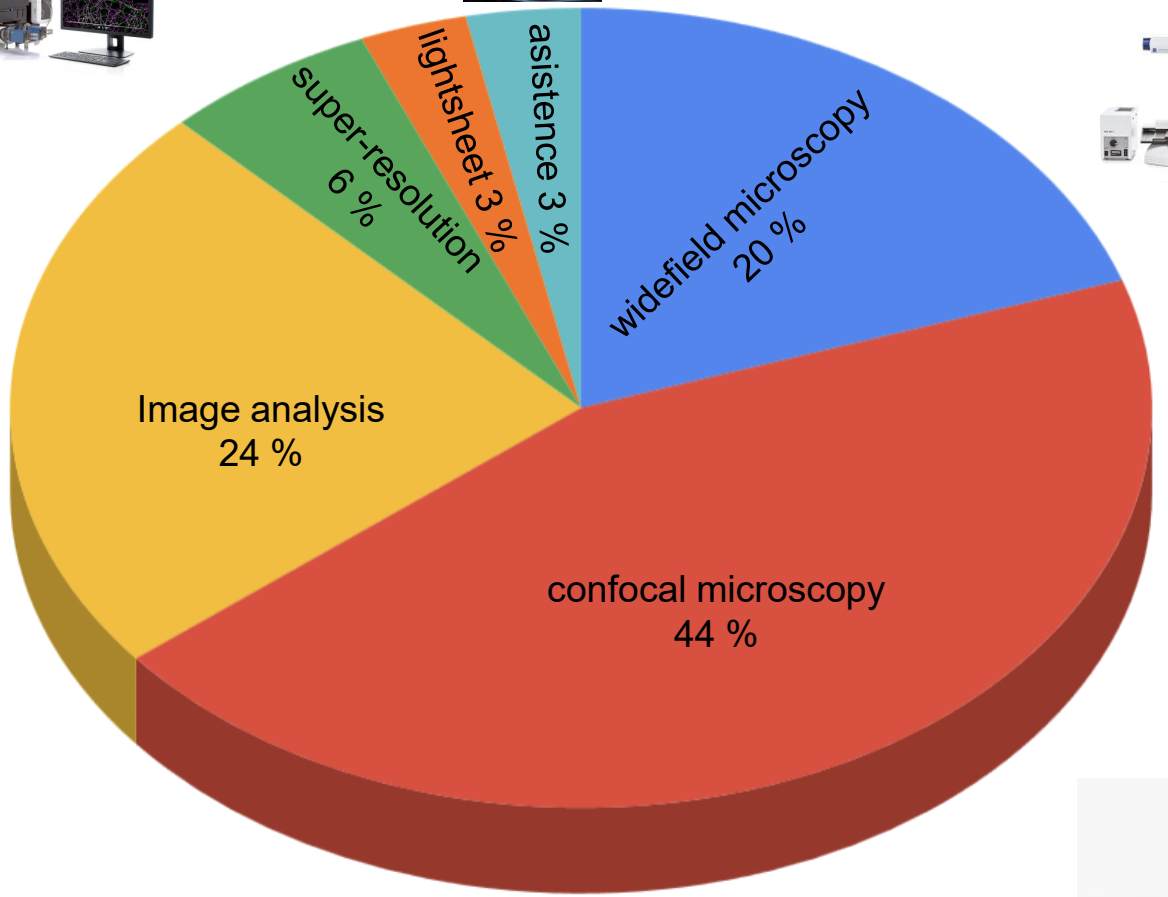
- **Services and instruments:**

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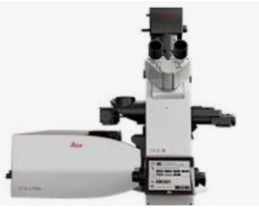










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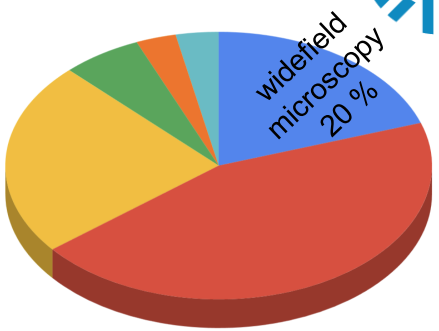
- Profile
- Staff members
- Users Committee
- Equipment
  - Stereo & zoom microscopes
  - Widefield microscopes
  - Scanning confocal microscopes
  - Spinning disc confocal microscope
  - Fluorescence Lifetime Imaging
  - Super-resolution microscopes
  - Lightsheet microscopes
  - Image processing workstations
  - Software
  - Equipment status

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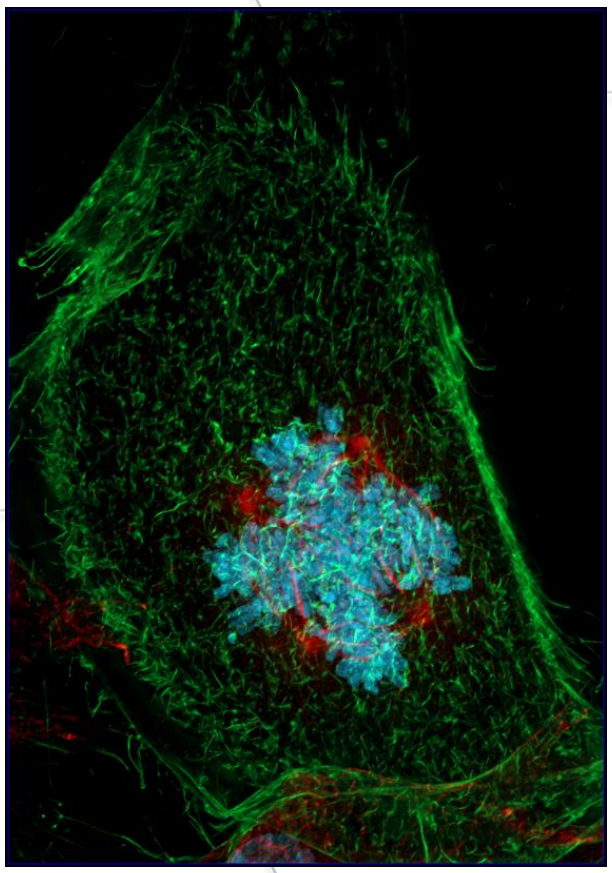
- **Services and instruments:** widefield microscopy

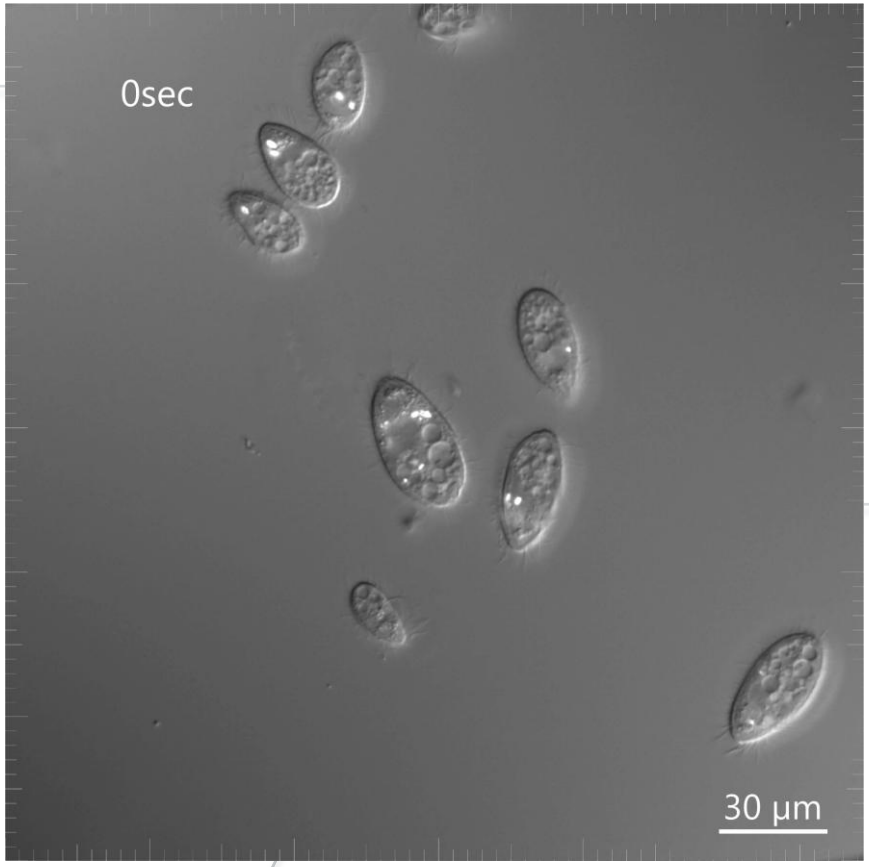
SCAN ME

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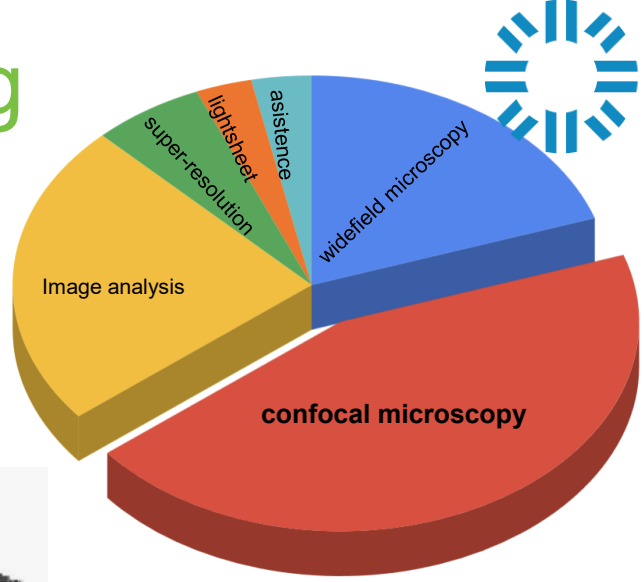




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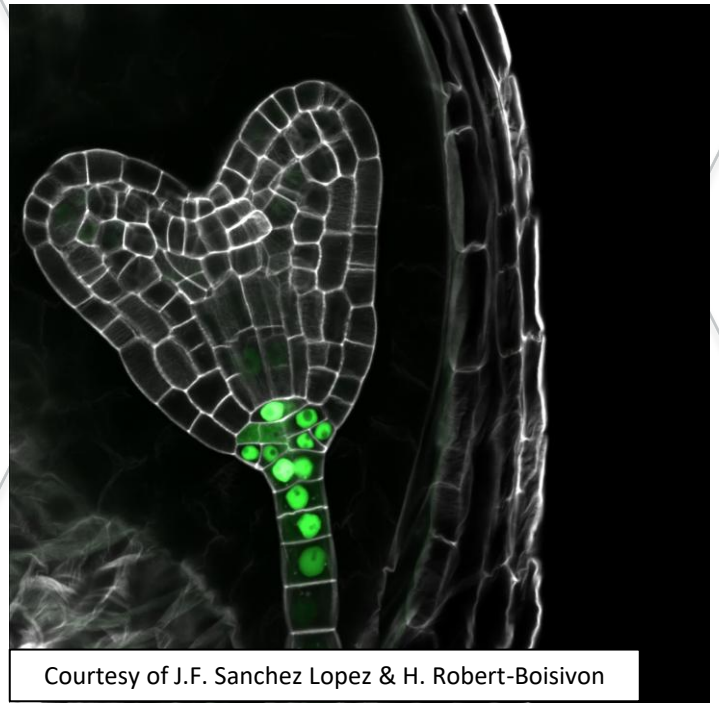
- **Services:** confocal microscopy

SCAN ME

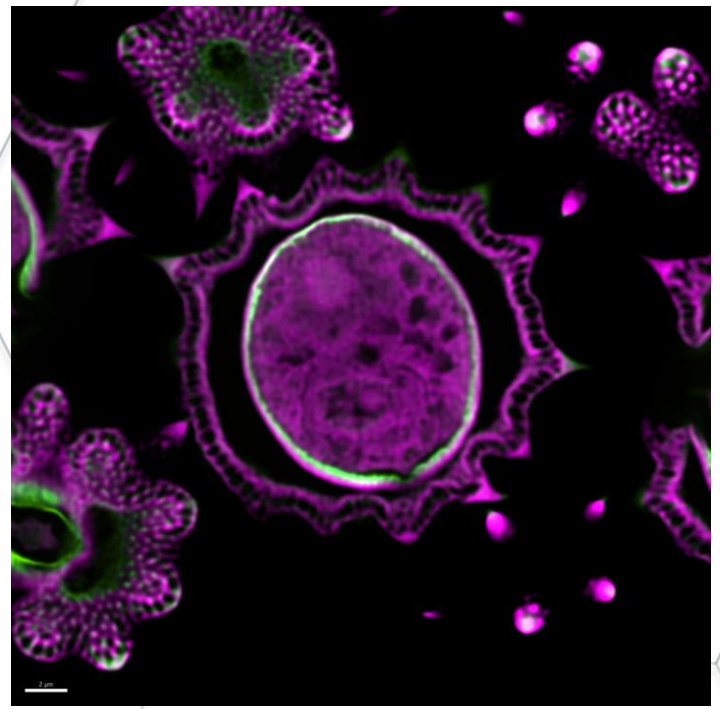


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Courtesy of J.F. Sanchez Lopez & H. Robert-Boisivon



Zeiss LSM 780 - Airyscan
Zeiss LSM 880 – Airyscan
Zeiss LSM 800
Zeiss LSM 910
Leica Stellaris 8 – Falcon
Evident Yokogawa W1 - SORA

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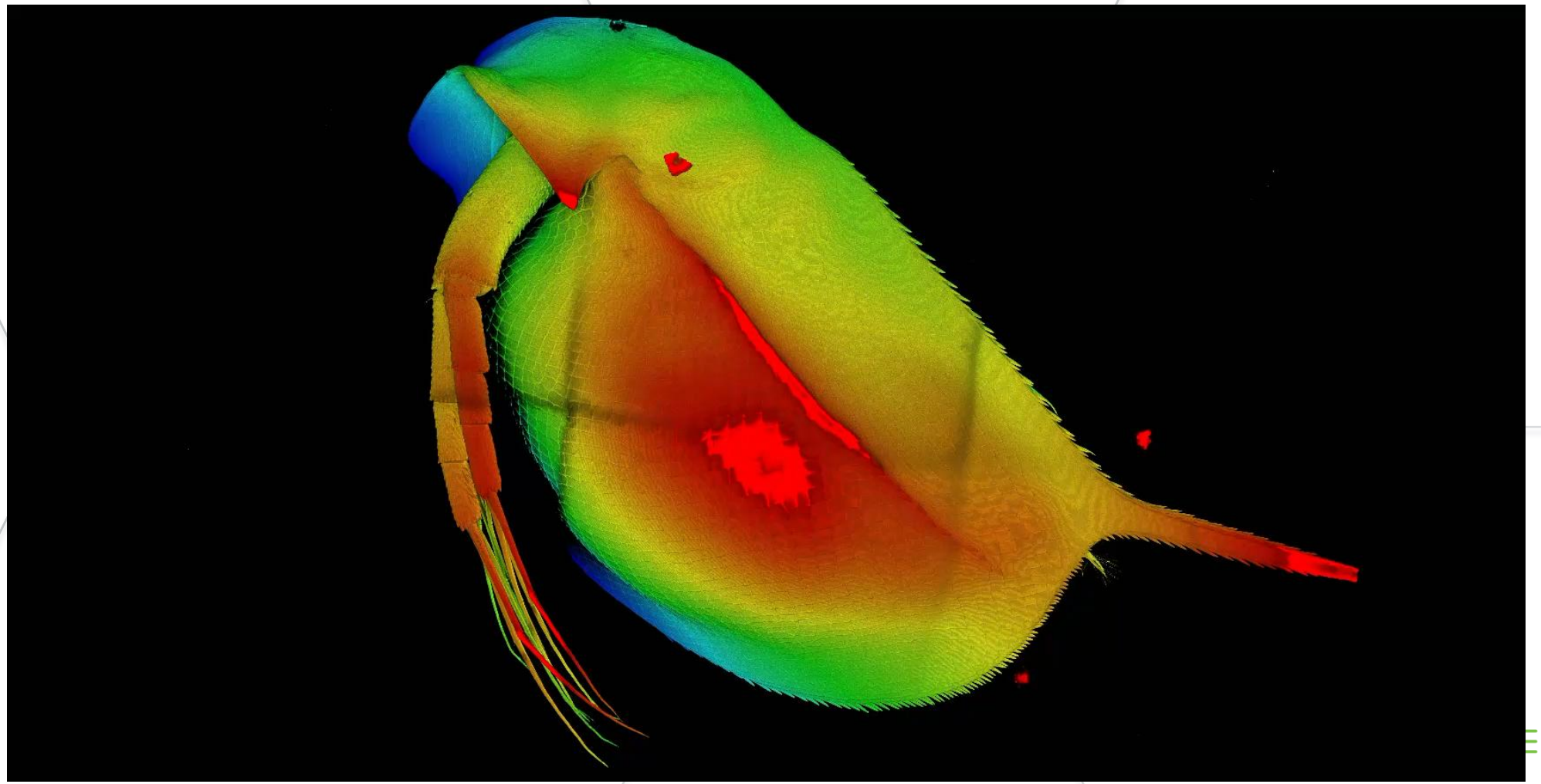
Nice colors



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Not only Nice colors

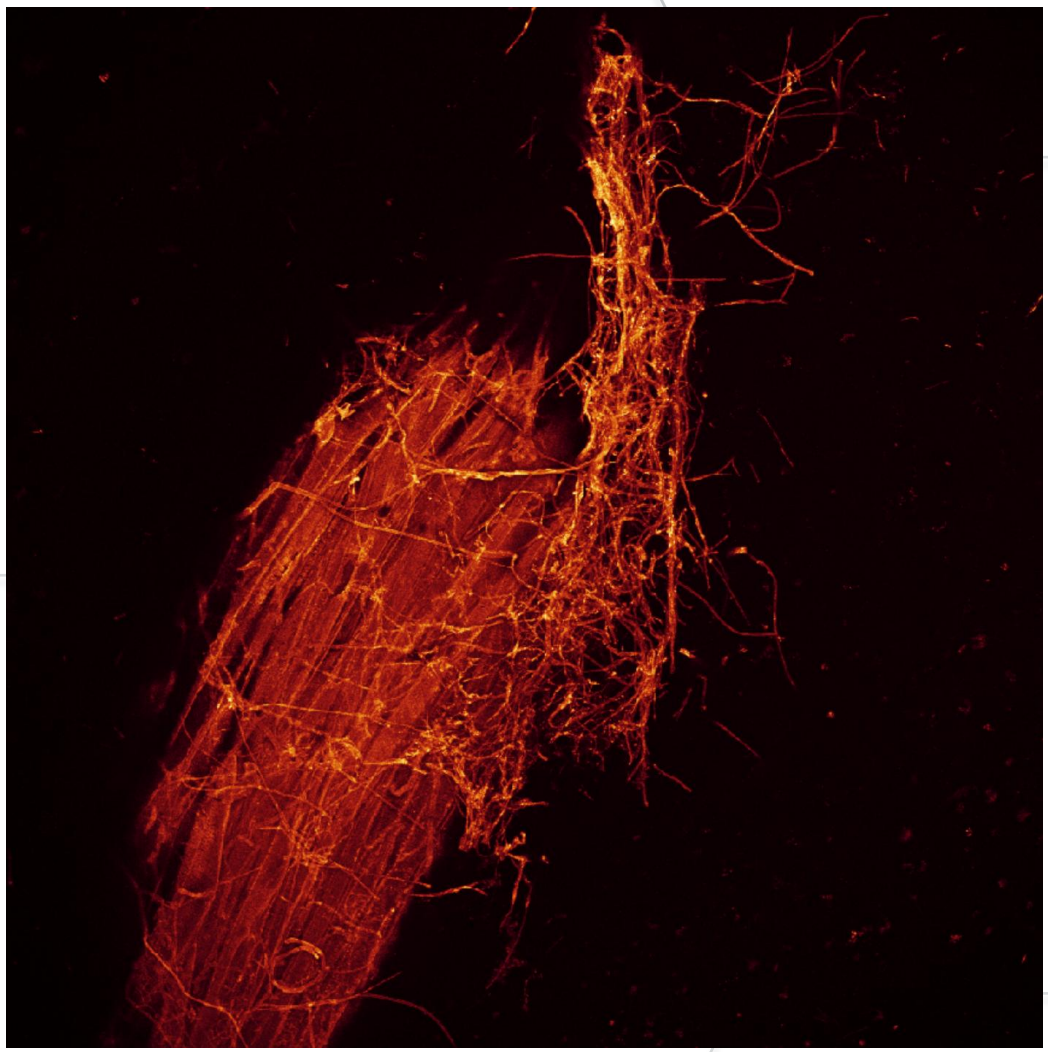
There is lifetime

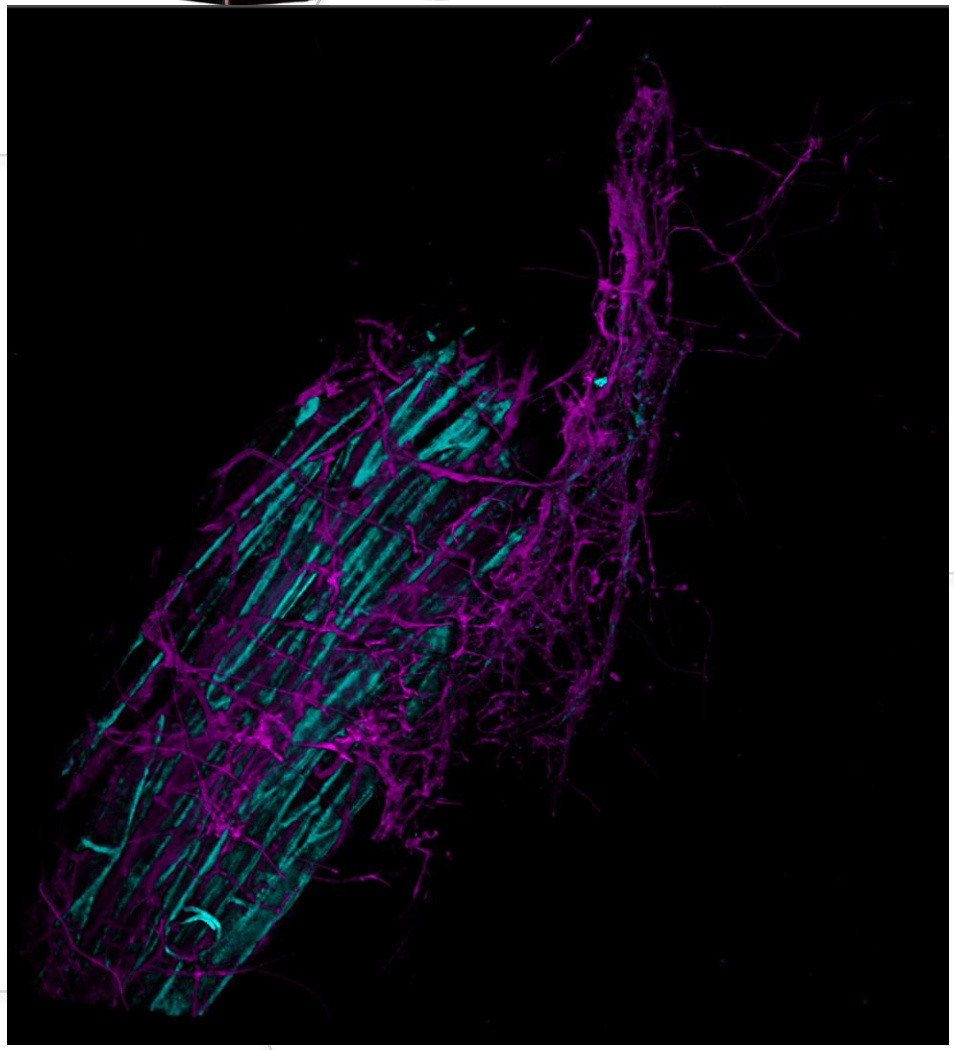


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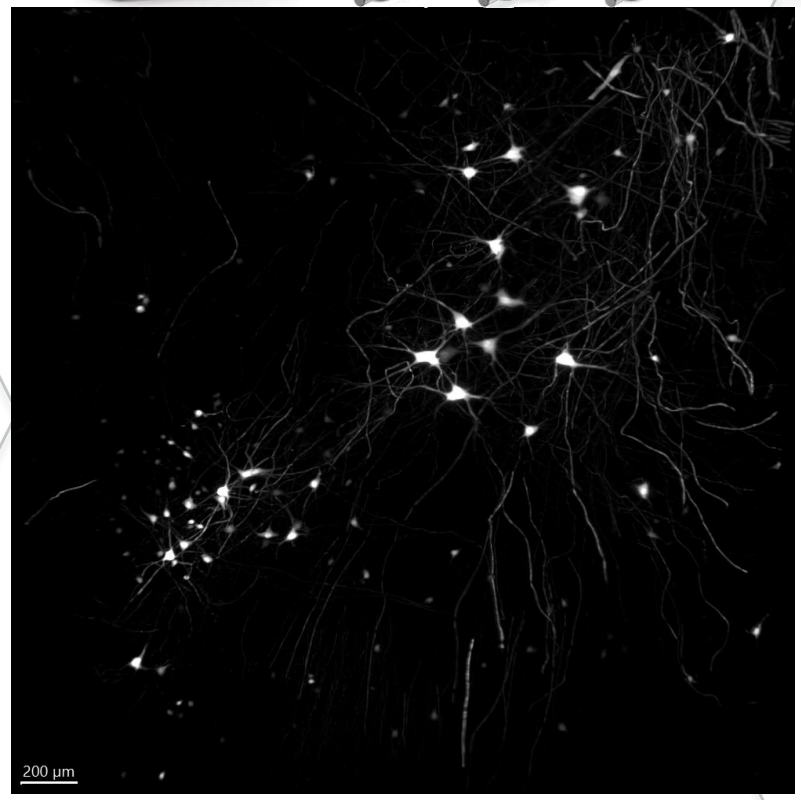
CZECH BIOIMAGING

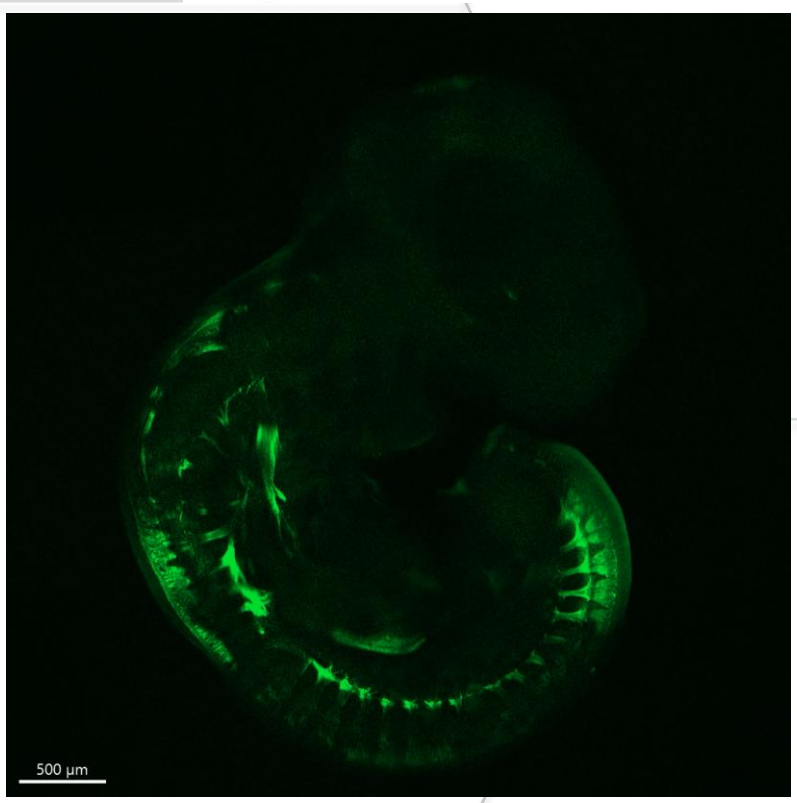
- **Services:** lightsheet microscopy, macroscopy

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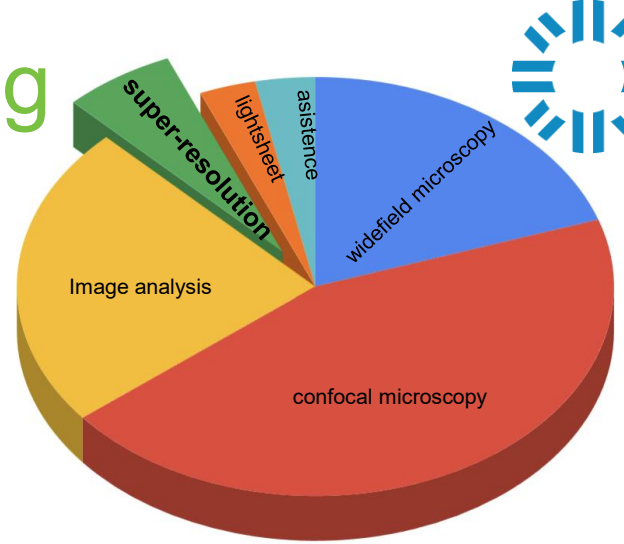
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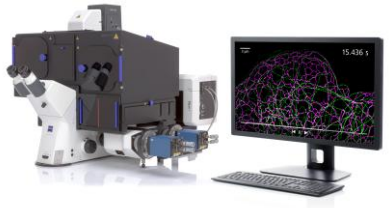
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- **Services:** super-resolution microscopy

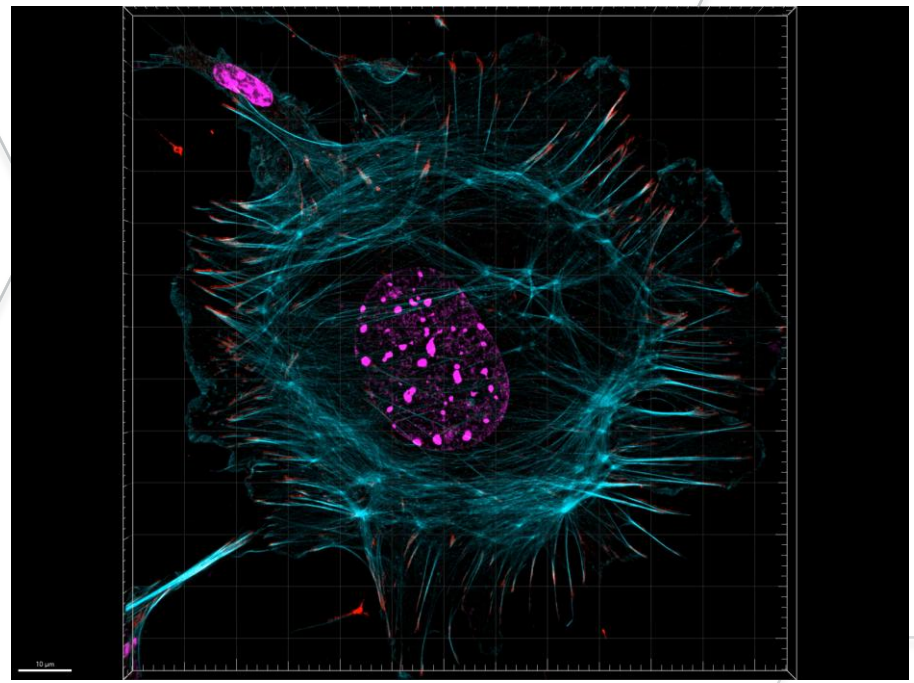
SCAN ME



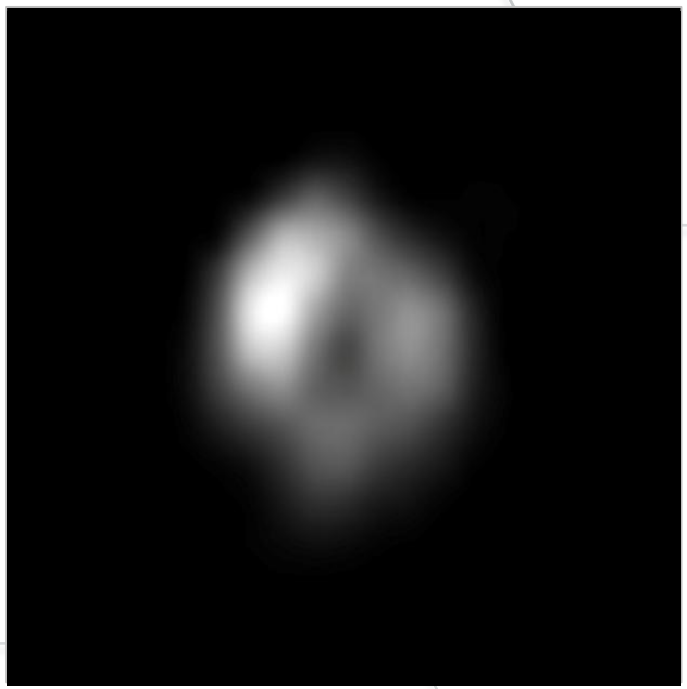
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Lattice SIM



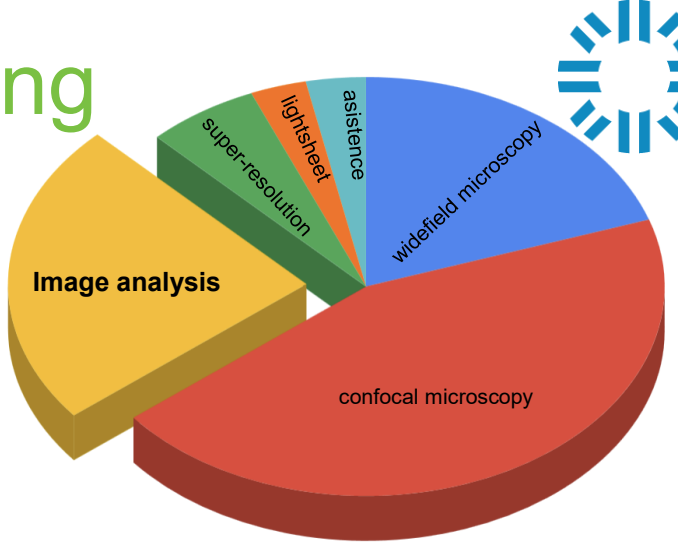
SMLM



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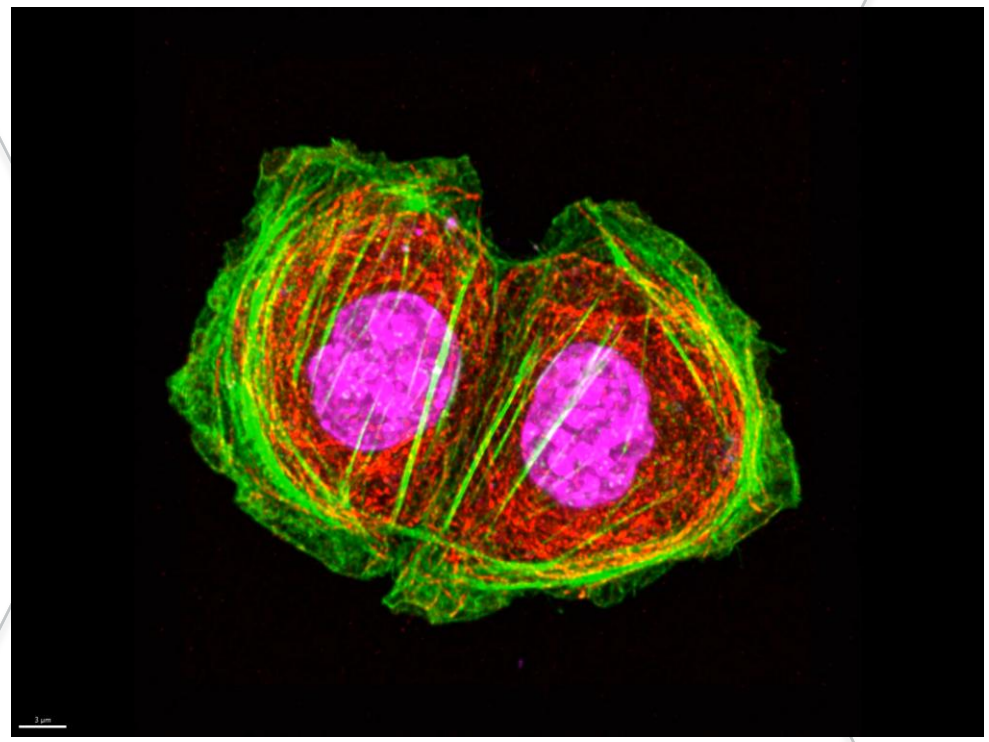


- **Services:** image analysis

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Remote access for external users



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ZEN ZEISS

1 licence, full pack
Airyscan, SIM processing
Deconvolution
Lightsheet processing

NEW IMARIS 10

1 licence
Objects segmentations, measurements, tracking
3D rendering

Open source
Objects segmentations, measurements
Lightsheet processing

Open source
Objects segmentations, measurements
High throughput

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Electronic Laboratory Notebook

OMERO

ACQUIFER

ZEN

Imaris

EVIDENT

CellProfiler™ cell image analysis software

ONEDATA

National Repositories

OMERO

eosc

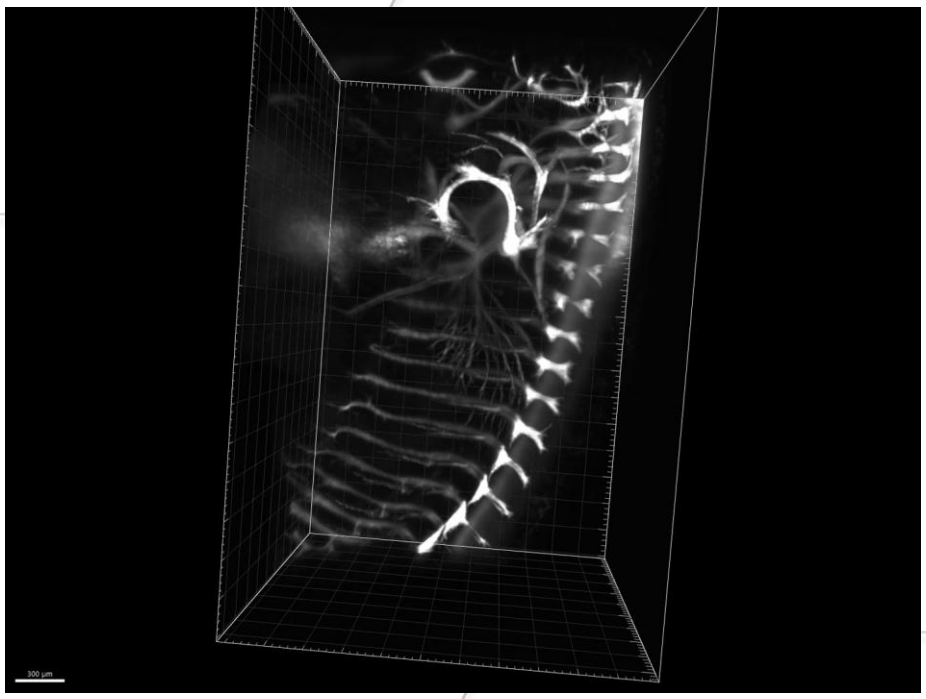
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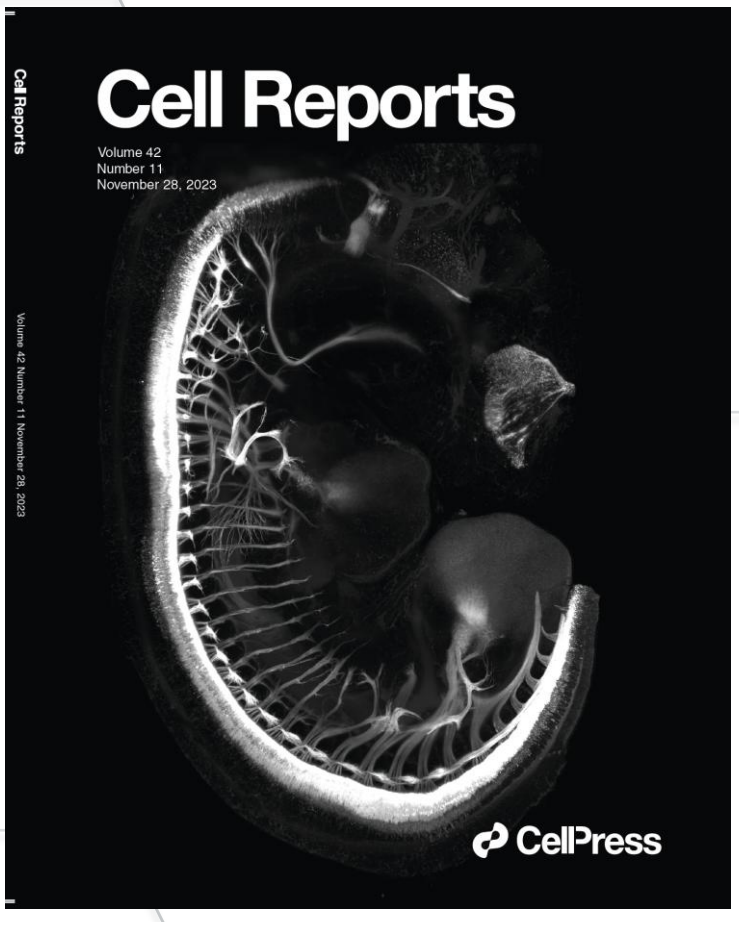
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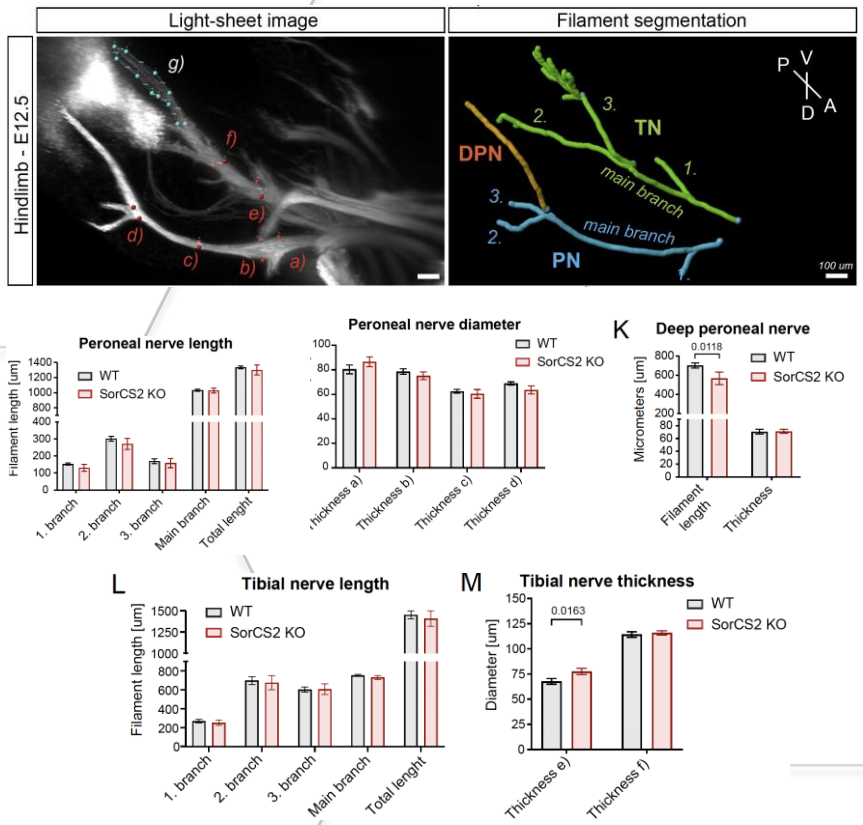
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Cell Reports

CellPress OPEN ACCESS

Article

SorCS2 binds progranulin to regulate motor neuron development

Pernille Bogetofte Thomasen,[1,2,8] Alena Salasova,[1,2,8,*] Kasper Kjaer-Sorensen,[3] Lucie Woloszczuková,[1,2] Josef Lavický,[4] Hande Login,[1,2] Jeppe Tranberg-Jensen,[1,2] Sergio Almeida,[1,2] Sander Beel,[5] Michaela Kavková,[4] Per Qvist,[2] Mads Kjolby,[1,2] Peter Lund Ovesen,[1,2] Stella Nolte,[1,2] Benedicte Vestergaard,[1,2] Andreea-Cornelia Udrea,[1,2] Lene Niemann Nejsum,[6] Moses V. Chao,[7] Philip Van Damme,[5] Jan Krivanek,[4] Jeremy Dasen,[7] Claus Oxvig,[3] and Anders Nykjaer[1,2,9,*]

Acknowledgement for Czech-BioImaging

The Core Facility is part of the national research infrastructure Czech-BioImaging funded by the Ministry of Education, Youth and Sports of the Czech Republic. Users whose measurement received financial support from Czech-BioImaging project are obliged to use the acknowledgment below:

Preferred version: „*We acknowledge the core facility CELLIM supported by the Czech-BioImaging large RI project (LM2023050 funded by MEYS CR) for their support with obtaining scientific data presented in this paper.*"

Short version: „*We acknowledge the core facility CELLIM supported by MEYS CR (LM2023050 Czech-BioImaging).*"

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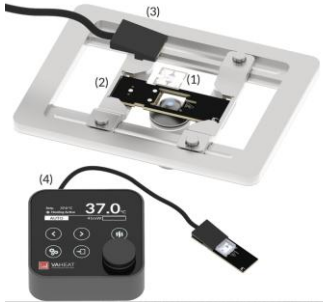
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- **Services:** hidden tools

VaHeat: Rapid changes of temperature
New upgrade coming soon possibility of cooling





Refractometer

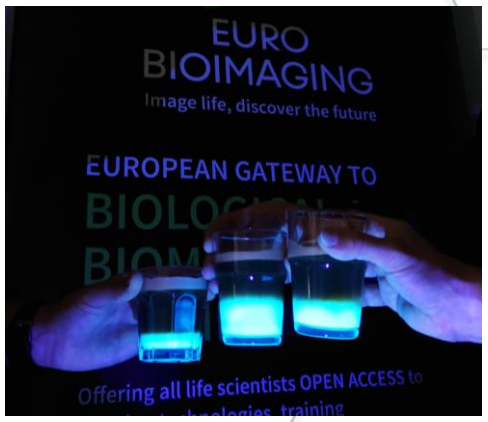


Big screens and powerfull computers

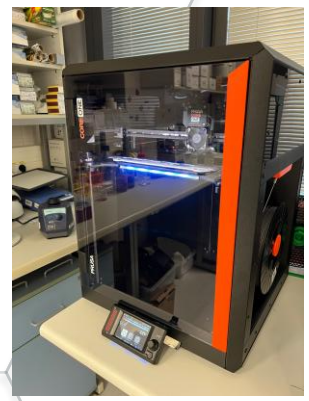


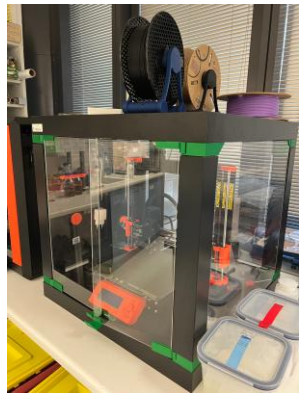
Mood boosters





3D printing



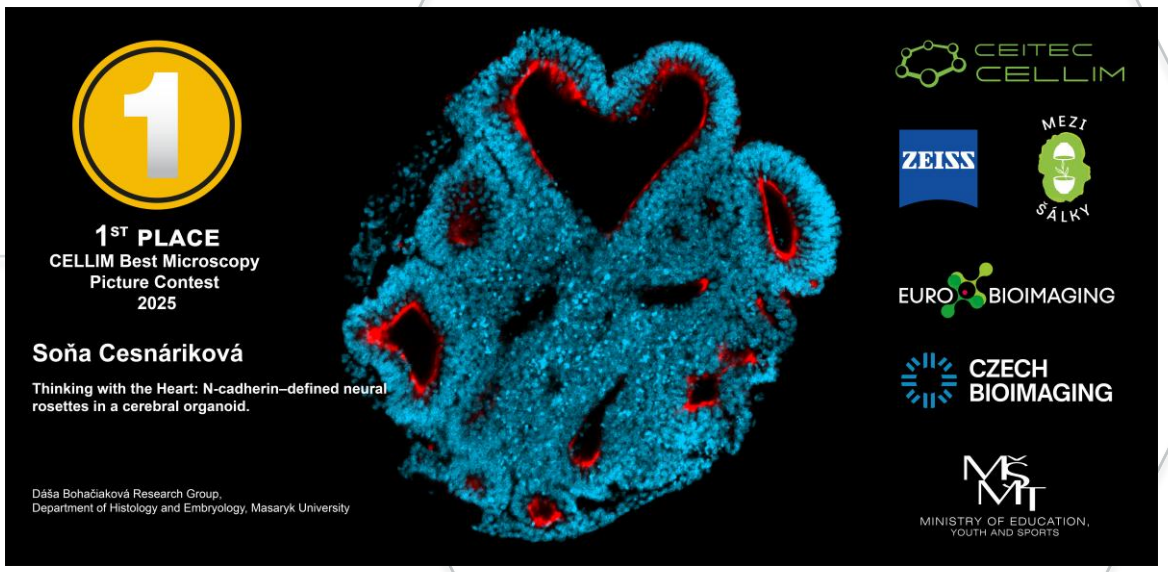


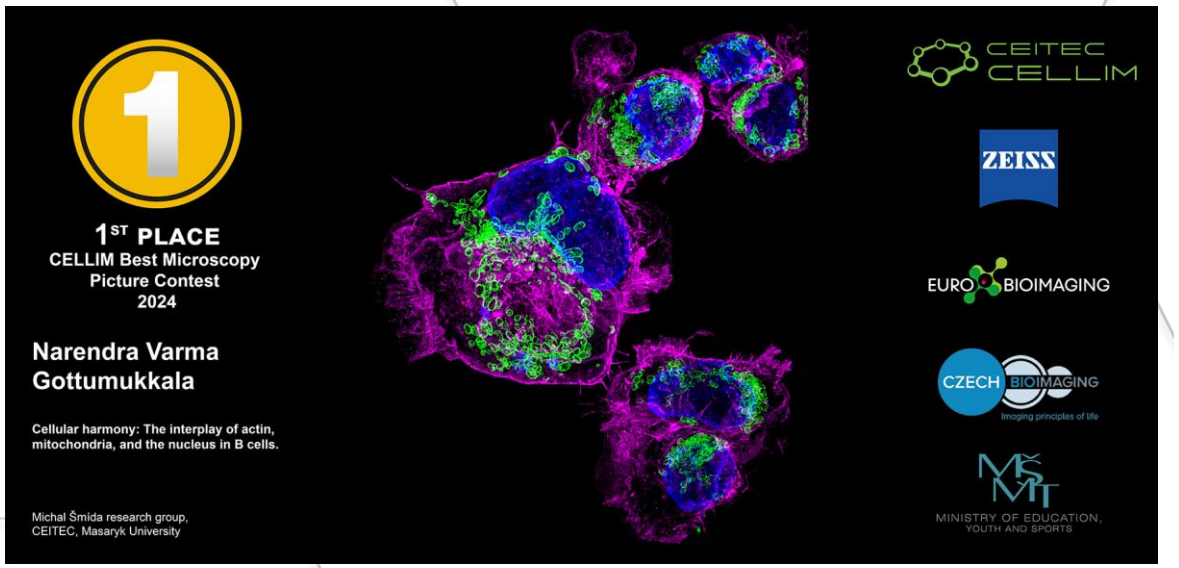
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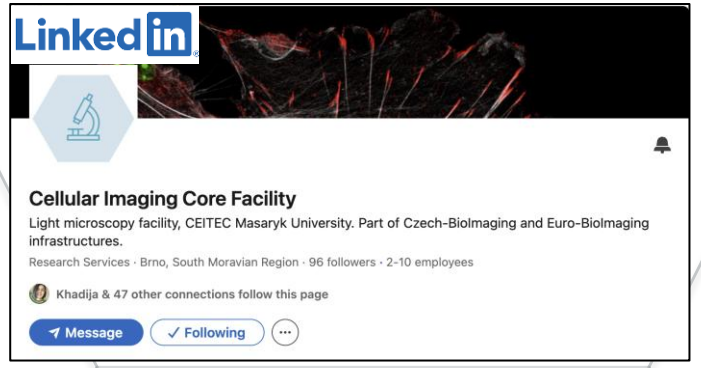
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Outreach activities and social media









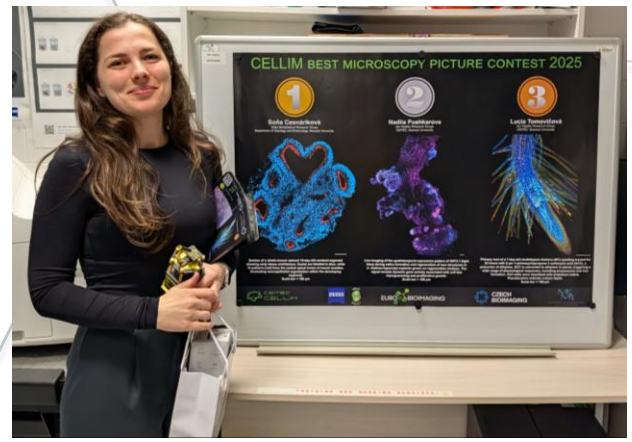




1st prize sponsored by Carl Zeiss





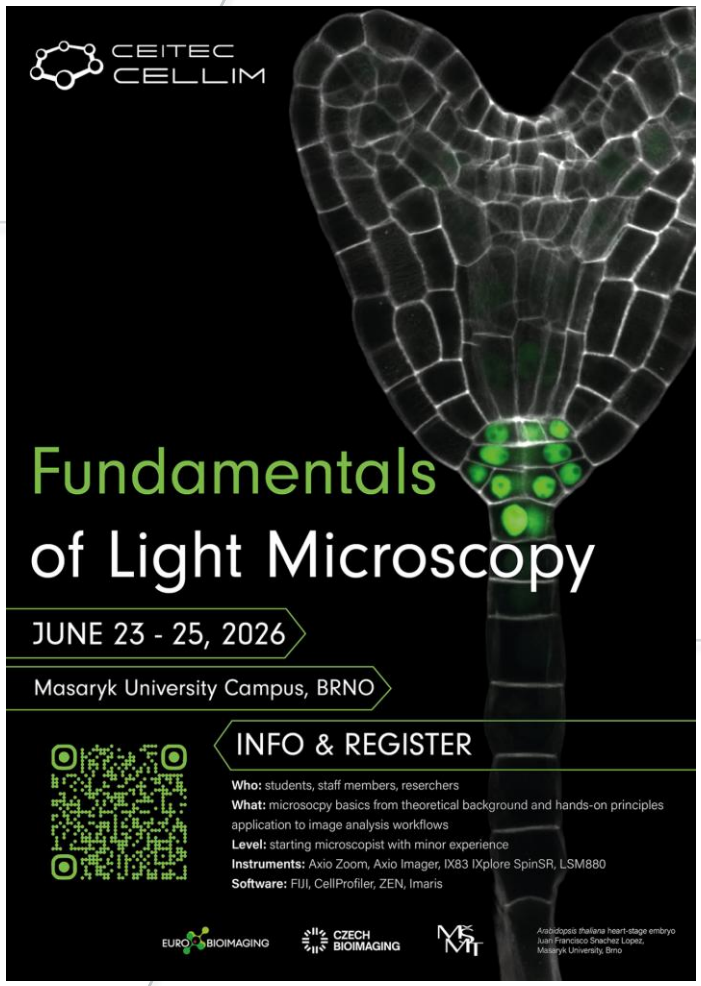


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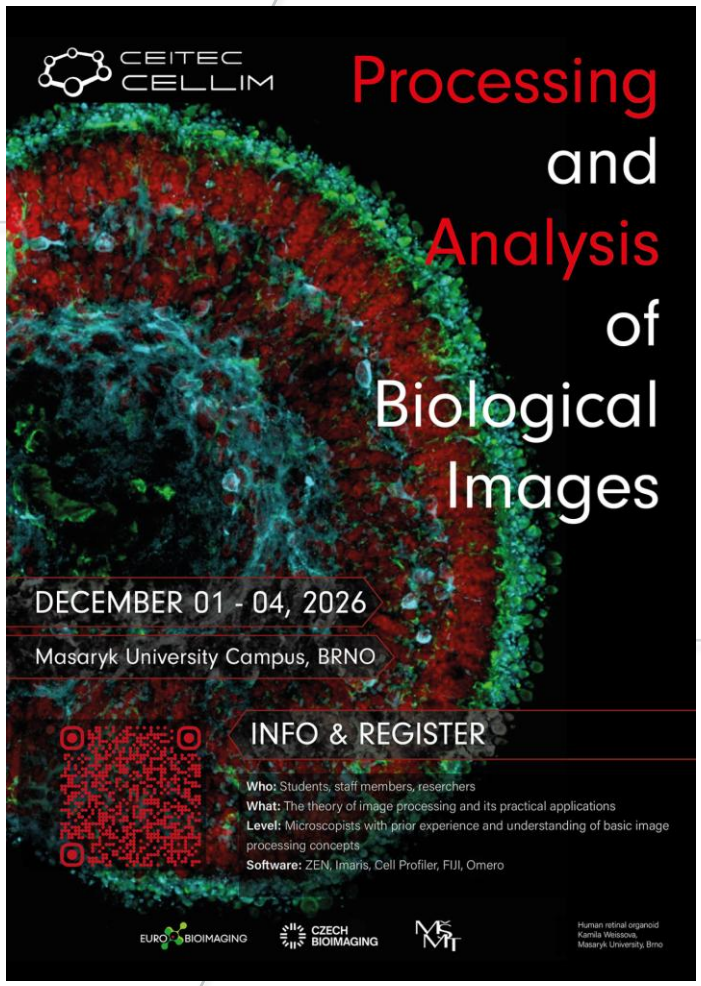
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Three annual courses and many other workshops/demos







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CEITEC -
Central European
Institute of Technology
Thank you for your attention!
Questions?
core.facility@ceitec.muni.cz
ceitec.eu/core-facilities/
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