



Scientific Board of CEITEC MU Meeting

10th November 2022

Overview of 2022

Jiří Nantl

Nature Index (NI)

2021 publications

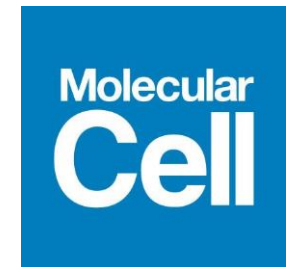
Czech institutions	Count Number of results in NI	Share Proportion of Local Authors According to the NI
Czech Academy of Sciences	470	91.36
Charles University	285	31.12
Masaryk University	92	16.04
Palacky University	113	15.49
University of Chemistry and Technology, Prague	32	10.15
Brno University of Technology	70	5.23
Czech Technical University in Prague	100	5.18
University of South Bohemia, Czech Republic	34	5.16
Mendel University in Brno, Czech Republic	61	4.64
Silesian University in Opava, Czech Republic	14	4.21
CEITEC MU	23	3.90

Publications 2022: Highlights

- Hluchy, M.; Gajduskova, P.; Ruiz de los Mozos, I.; Rajecky, M.; Kluge, M.; Berger, B.-T.; Slaba, Z.; Potesil, D.; Weiss, E.; Ule, J.; Zdrahal, Z.; Knapp, S.; Paruch, K.; Friedel, C. C.; **Blazek, D.** CDK11 Regulates Pre-mRNA Splicing by Phosphorylation of SF3B1. *Nature* **2022**, 609 (7928), 829–+. <https://doi.org/10.1038/s41586-022-05204-z>.
- Cairo, A.; Vargova, A.; Shukla, N.; Capita, C.; Mikulkova, P.; Valuchova, S.; Pecinkova, J.; Bulankova, P.; **Riha, K.** Meiotic Exit in Arabidopsis Is Driven by P-Body–Mediated Inhibition of Translation. *Science* **2022**, 377 (6606), 629–634. <https://doi.org/10.1126/science.abo0904>.
- Zapletal, D.; Taborska, E.; Pasulka, J.; Malik, R.; Kubicek, K.; Zanova, M.; Much, C.; Sebesta, M.; Buccheri, V.; Horvat, F.; Jenickova, I.; Prochazkova, M.; Prochazka, J.; Pinkas, M.; Novacek, J.; Joseph, D. F.; Sedlacek, R.; Bernecky, C.; O’Carroll, D.; **Stefl, R.**; Svoboda, P. Structural and Functional Basis of Mammalian MicroRNA Biogenesis by Dicer. *Molecular Cell* **2022**, 82 (21), 4064–4079.e13. <https://doi.org/10.1016/j.molcel.2022.10.010>.

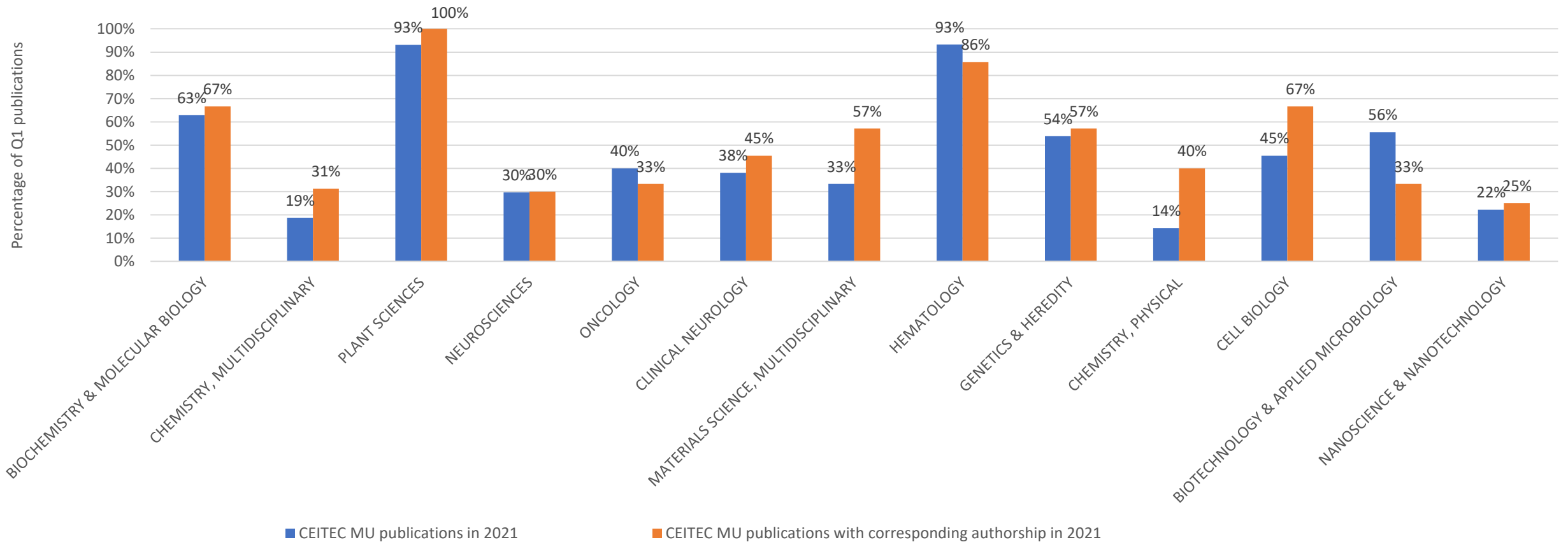
nature

Science^{AAAS}



Research Field - Oriented Analysis

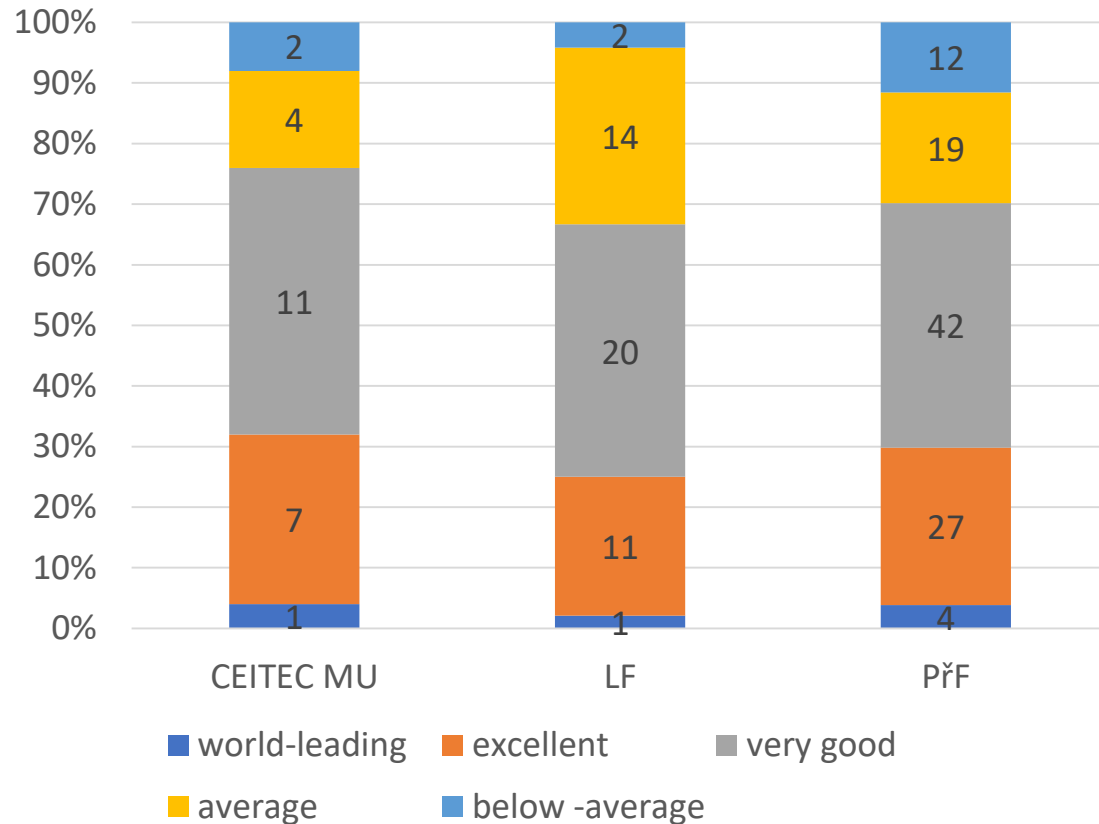
Quality of CEITEC MU Publications in Subject Categories: Percentage of Publications in Q1 in 2021



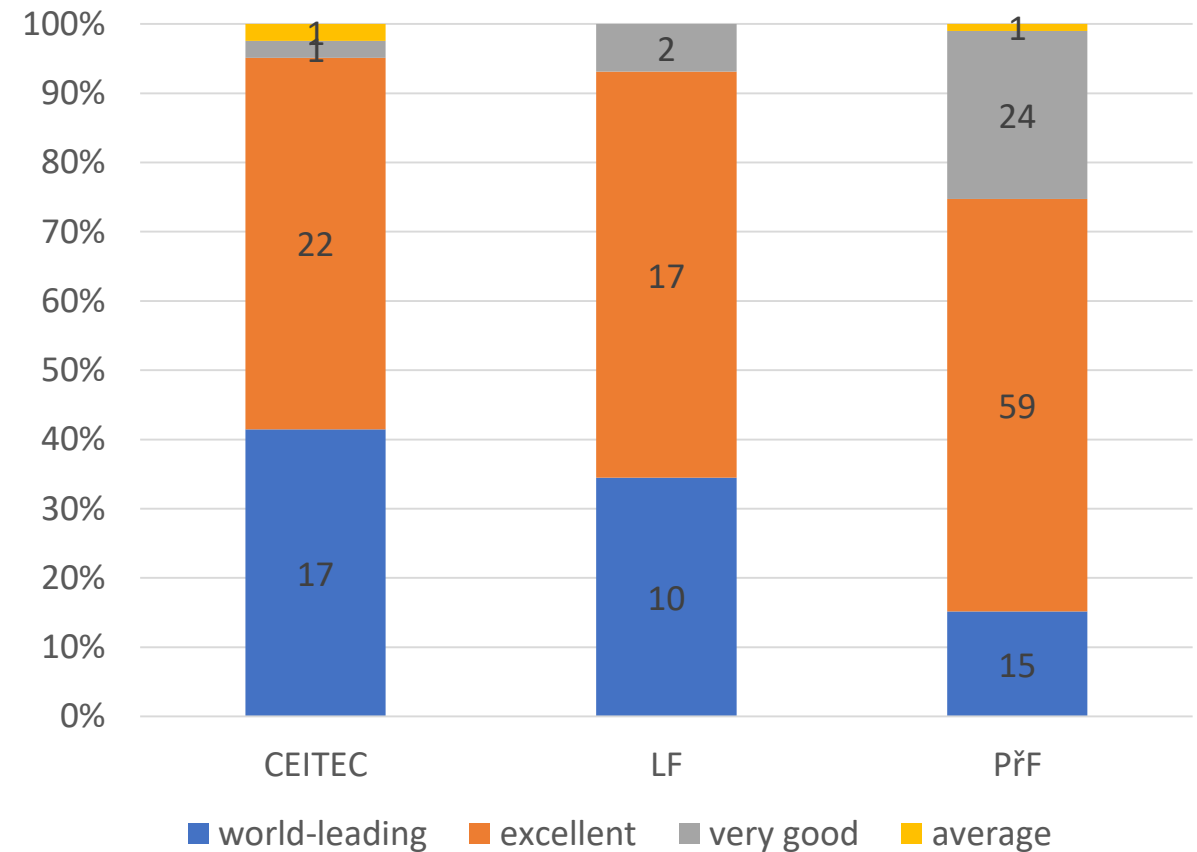
National evaluation system „M17+“

Module 1: Quality of Selected Results

Evaluations of nebiblio results
(summary of evaluation H17 – H21)



Evaluations of biblio results
(evaluation H19 - H21)



Grants

The grant strategy is based on **individual research grants**.

CEITEC MU has a **higher than national average success rate in all national grant schemes**.

CEITEC has ambition to receive **institutional grants** that support further development initiatives at a larger scale: Horizon Europe – Teaming and OP JAK.

Success rate in % of projects submitted and awarded

Percentage Success Rate – Submitted / Awarded Projects				
	2018	2019	2020	2021
National	43%	23,90%	31,80%	32,70%
International	12,80%	32%	30,80%	30,30%



CEITEC wants to strengthen Brno's position on the global electron microscopy map

TEAMING proposal submitted

- **CORMIC** - Bridging Academia and Industry in Correlative Microscopy
- **Partners:** CEITEC MU, CEITEC BUT, ISI CAS, EMBL, TU-Wien
- **Impact**
 - life science research leveraging correlative microscopy approaches
 - microscopy technology development at the interface of life and material sciences
 - education of experts in microscopy
 - technology transfer and entrepreneurial spirit
- **Submission 2nd round:** 8th September 2022
- **Evaluation result expected:** **December 2022**
- **Competition:**
 - 116 proposals to 1st round evaluation (9 from the Czech Republic submitted)
 - 32 projects were invited for 2nd round, max. 10 projects will be awarded

Selected Grant Achievements 2022

- **P. Plevka: ERC Consolidator** – EU - Phage infection of bacterial biofilm (1 992 976 EUR)
- **J. Hritz: Excellence Hubs – Horizon Europe** - Alzheimer's Disease Diagnostics Innovation and Translation to Clinical Practice in Central Europe (1 684 319 EUR)
- **I. Rektor: Pathfinder - EIC** - First Closed-loop non-Invasive Seizure Prevention System (356 500 EUR)
- **A. Ghosh (RG L. Trantírek): MSCA-PF – Horizon Europe** - In vitro and In-cell characterization of Quadruplex-duplex hybrids: conformation, folding, ligand binding and implications for in-cell NMR based assays (166 279 EUR)
- **P. Plevka: EXCELES – National Recovery Plan (MEYS)** – National Institute of Virology and Bacteriology (7 mil. EUR)
- **O. Slabý: EXCELES – National Recovery Plan (MEYS)** - National Institute for Cancer research (2,4 mil. EUR)

TWO GA CR EXPRO for CEITEC MU

- **K. Říha: GAČR EXPRO** - Biomolecular condensates in plant germline differentiation (49 730 000 Kč)
- **D. Blažek: GAČR EXPRO** - Identification and characterization of a new pathway regulating pre-mRNA splicing (49 981 000 Kč)

GA CR Project Proposals 2023 (total/awarded)	CEITEC	ECON	PHARM	ARTS	FI	SPORT	FSS	MED	PED	LAW	SCI	ICS	TOTAL
EXPRO	6/2	0	0	3/0	0	1/0	3/1	0	0	0	2/0	0	15/3
JUNIOR STAR	2/0	3/0	1/0	3/1	1/0	2/0	2/0	0	0	0	4/1	1/0	19/2
TOTAL SUM	8/2	3/0	1/0	6/1	1/0	3/0	5/1	0	0	0	6/1	1/0	34/5

GA CR

EXPRO	2020	2021	2022*	2023
Submitted Projects GA CR- (MU*)	133 (24)	123 (24)	-	? (15)
Awarded Projects GA CR- (MU*)	22 (3)	16 (6)	-	10 (3)
Success Rate in % - CR TOTAL (MU*)	16,5 (12,5)	13 (25)	-	? (20)

* The EXPRO competition was not announced in 2022

JUNIOR STAR	2021	2022	2023
Submitted Projects GA CR- (MU*)	355 (28)	315 (28)	? (19)
Awarded Projects GA CR- (MU*)	30 (2)	16 (3)	23 (2)
Success Rate in %- CR TOTAL (MU*)	8,4 (7,1)	5 (10,7)	? (10,5)

CEITEC PhD School

- Currently **79 students** in total
- Gender balance: 41F / 38M
- 38 international students from 17 countries
- Graduates 7 (2021 – 3 graduates)
- Abandoned studies: 1

Life Sciences Programme (Sci)

- newly re-accredited since the academic year 2021/2022
- students 75 / international 52

Molecular Medicine (Med)

- first international students (3) admitted in 2021
- students 6 / international 3

Events as a building blocks of community development

**Scientific
events**

**Community
events**

**Public
events**

Retreats
Group leaders
Postdocs
PhDs

**Career
development
events**



Selected training

- [EMBO Course Light sheet microscopy](#)
- [Leadership and Mentoring Skills for Research Group Leaders and Core Facility Heads](#) by Saša Kočevár, Thomas Frick
- [SIY Adaptive Resilience Series](#) – Mental Health and Stress Management for postdocs
- [How to be an Active Bystander](#) by Magali Berger Churchill
- [Presentation skills for Research Group and Core Facility Heads](#) by Dr Samuel Lagier
- [Communication in media](#) by Czech Press Office
- [Culture Differences in Communication](#) by Eva Gaborikova



HR EXCELLENCE IN RESEARCH

Awards for CEITEC researchers in 2022

- Rector's Award for Extraordinary International Grant Competition Results – **Robert Vácha**
- Rector's Award for Outstanding Research Results Achieved by Young Scientists under 35 – **Zdeněk Farka**
- Rector's Award for innovations in teaching – **Nikola Kostlánová**
- NEURON Prize for promising scientists – **Gabriel Demo**
- Purkyne Foundation Award for best publication – **Václav Šeda**
- New EMBO member – **Šárka Pospíšilová**



TECHNOLOGY TRANSFER: Successful Cases 2022

- Licence:

- licence agreement with **Allfinity** to use softwares:
 - 4D CHAINS: 30kCZK/year + 8% royalties
 - 4D GRAPHS: 40kCZK (one-time fee) + 8% royalties

- Service Agreements:

- **ECM DIAGNOSTICS** (RG Ondřej Slabý, 5kUSD)
- **BioVendor** (CF Genomics, 36kCZK)

- Collaboration Agreement:

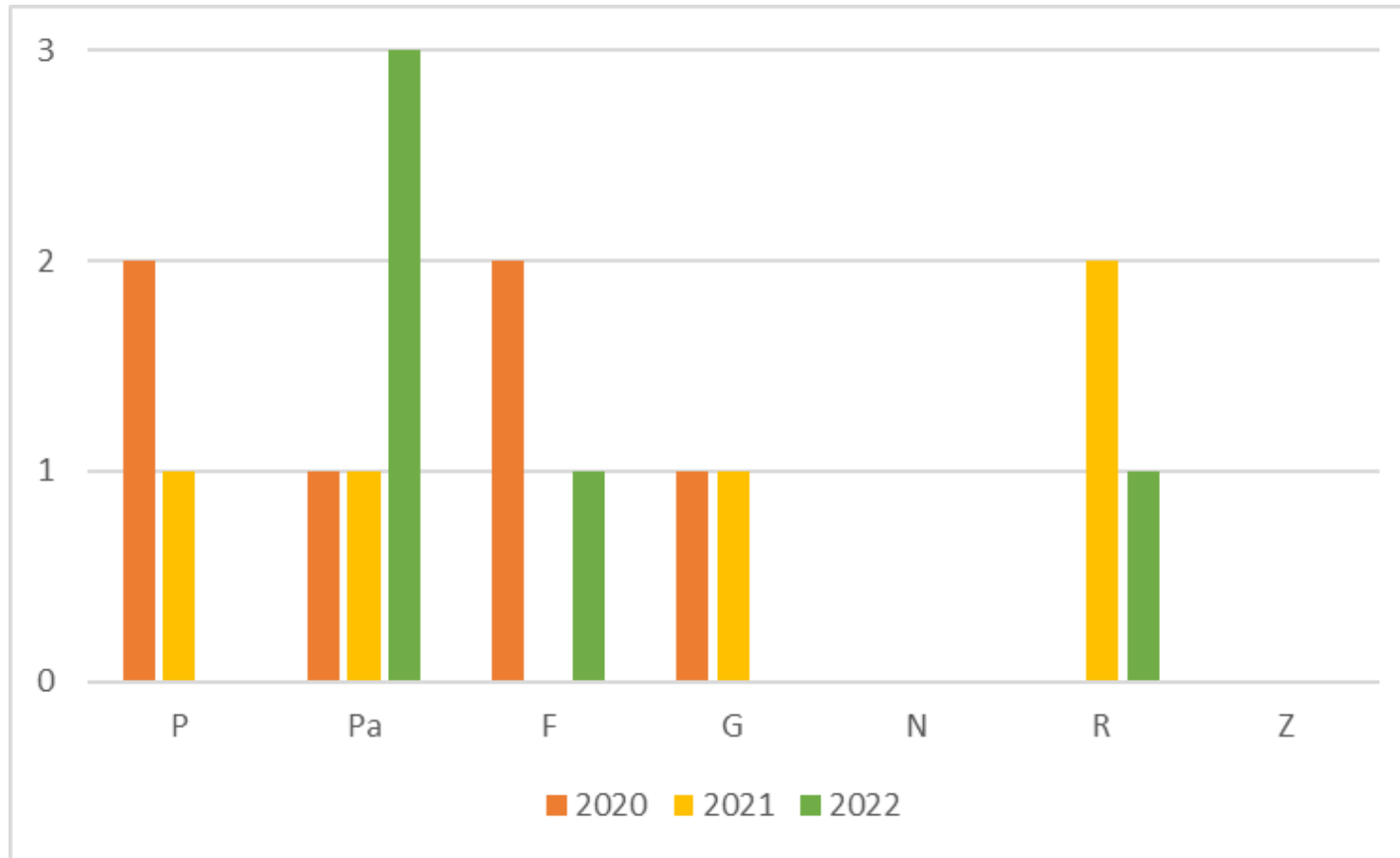
- **AppsDevTeam** (CF Bioinformatics/RG Panagiotis Alexiou)

- Amendment to Collaboration Agreement (contract extension):

- **Thermo Fisher Scientific** (CF CryoEM)

Applied Results 2020-2022*

*period 1.1.2020 – 4.11.2022



Legend:

P – Patent (granted), **P_a** – Patent application, **F** – Utility Model, **G** – Prototype, **N** – Methodics, **R** – Software, **Z** – Pilot Plant

Dissolution of Panagiotis Alexiou Research Group

Congratulation to **Panagiotis Alexiou** who have been offered and accepted an **ERA Chair position** to build up a Bioinformatics research program at the University of Malta.



ISAB 2022

ISAB 2022



Dirk Inzé



Witold Filipowicz



Christoph M. Michel



Claudia Köhler



Michal Hocek



Michael Hothorn



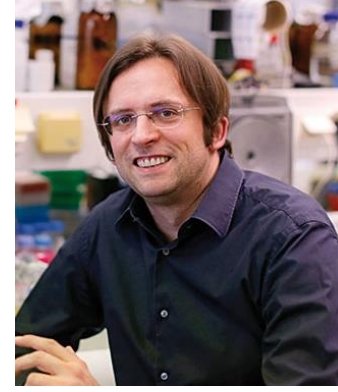
Gaia Pigino



Dorothea Bartels



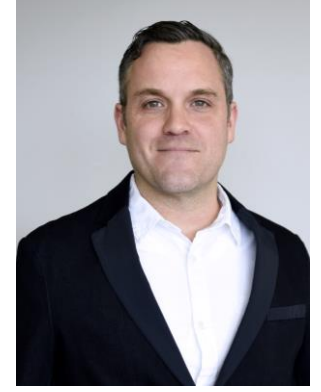
Viktor K. Jirsa



Johannes Zuber



Philipp Selenko



Eric Lecuyer

Evaluation of research excellence 2022



Evaluation of research excellence 2022

- Mini-conference: 17. 10. 2022
- Interviews: 18. 10. 2022
- Meeting with CEITEC MU management: 19. 10. 2022
- Final report expected in **November**



CEITEC MU Core Facilities

Pavel Plevka



**Cryo-electron
Microscopy and
Tomography**

Nanobiotechnology

**Cellular
Imaging**

**Multimodal and
Functional Imaging
Laboratory**

**X-ray Diffraction
and Bio-SAXS**

**Biological Data
Management
and Analysis**



Genomics

NCMG



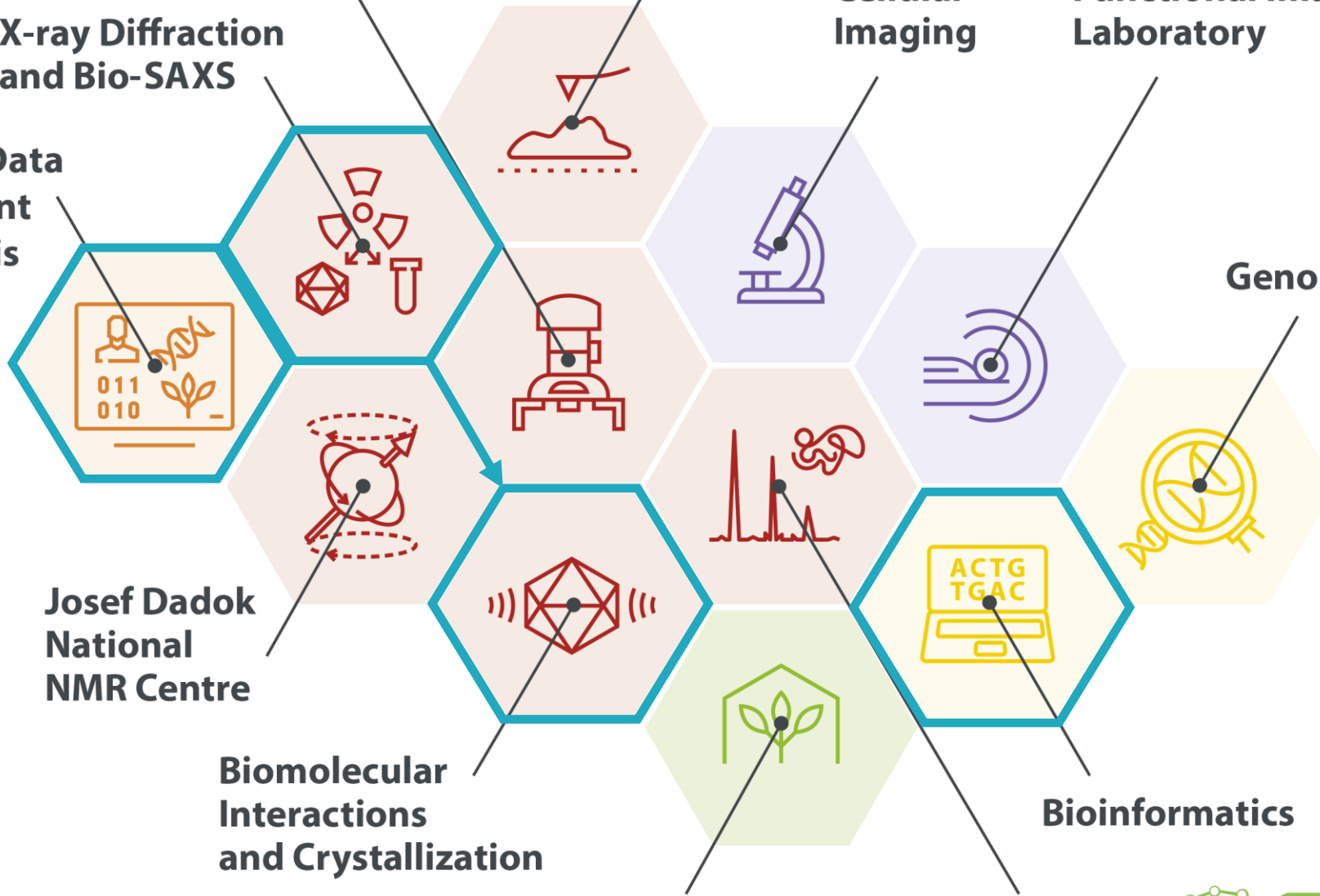
**Josef Dadok
National
NMR Centre**

**Biomolecular
Interactions
and Crystallization**

Plant Sciences

Proteomics

Bioinformatics





2022 CF Evaluation

Chair: Pavel Plevka, CEITEC MU Deputy Director for Research Infrastructure

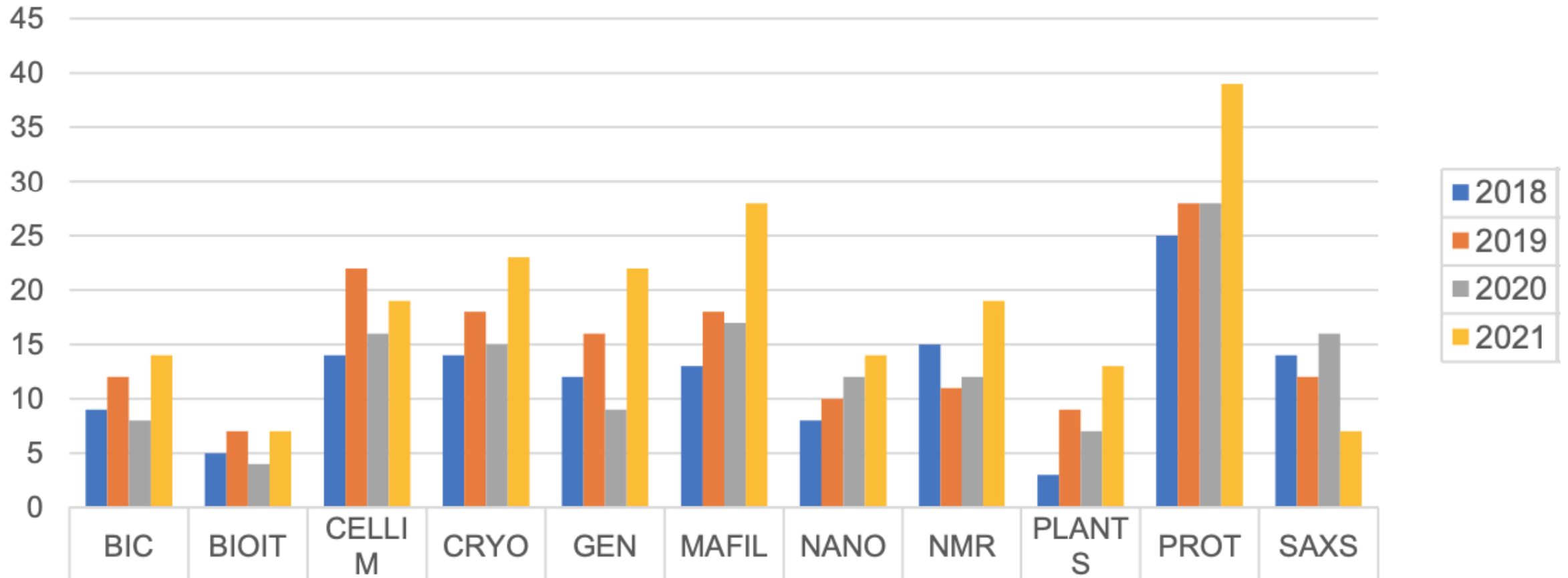
Members:

- **Karel Říha**, CEITEC MU Deputy Director for Science
- **Martin Blackledge**, Institut de Biologie Structurale
- **Fernando Peláez**, CNIO
- **Jakub Jež**, Vienna BioCenter Core Facilities (VBCF)
- **Claus Lamm**, University of Vienna
- **Gábor Csúcs**, ETH Zürich

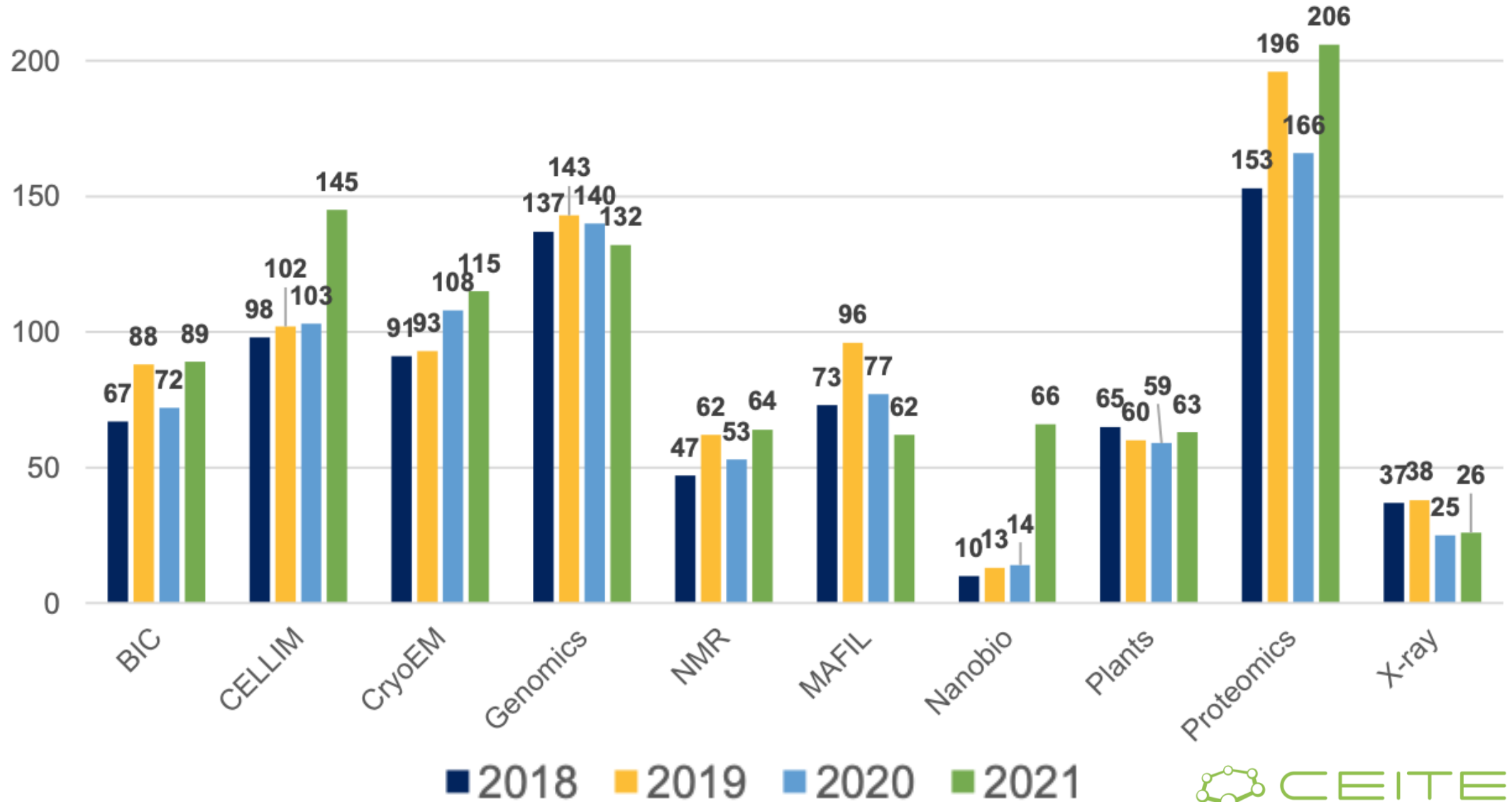
Secretary: Kateřina Hošková, CEITEC MU Core Facilities and Research Infrastructure Specialist

On-site support: Pavla Pospíšilová, CEITEC MU project administrator

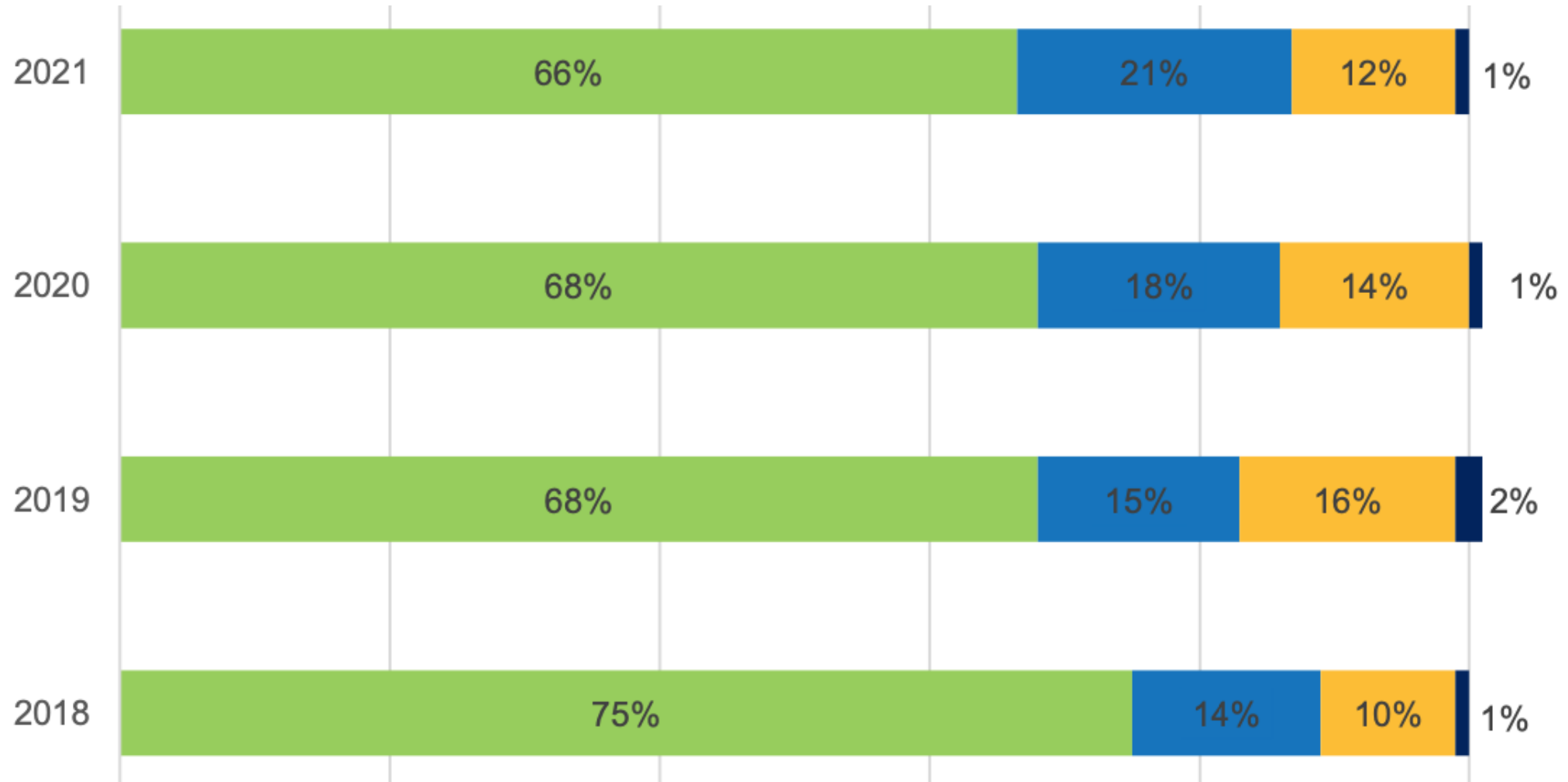
Acknowledgments to CFs



Number of users



Internal vs. external users



■ CEITEC MU users

■ MU users (excl. CEITEC MU users)

■ External academic users (excl. MU users)

■ Commercial users

CF day 22. 11. 2022

- Event webpage:
bit.ly/CFDayMeeting2022
- Hybrid: ZOOM / E35-145
- Content:
 - CF overview – services, trainings, user rules
 - New instrumentation
 - CF data policy

09:45 – 10:00	<i>waiting room/technical preparedness</i>
10:00 – 10:10	CF introduction - <i>Ester Jarour</i>
10:10 – 10:30	CF Plants
10:30 – 10:50	CF NMR
10:50 – 11:00	<i>coffee break</i>
11:00 – 11:20	CF Nanobiotechnology
11:20 – 11:40	CF CryoEM
11:40 – 12:10	CF BIC + X-ray
12:10 – 13:00	<i>Lunch break</i>
13:00 – 13:20	CF Proteomics
13:20 – 13:40	CF CELLIM
13:40 – 14:00	CF MAFIL
14:00 – 14:10	<i>coffee break</i>
14:10 – 14:30	CF Genomics
14:30 – 14:50	CF BioIT
14:50 – 15:10	CF BioData
15:10 – 16:00	<i>discussion room</i>

Nucleolar rDNA folds into condensed foci with a specific combination of epigenetic marks

Konstantin O. Kutashev^{1,2,†} , Michal Franek^{1,†} , Klev Diamanti^{3,4} , Jan Komorowski^{3,5} , Marie Olšinová⁶  and Martina Dvořáčková^{1,*} 

¹Mendel Centre for Plant Genomics and Proteomics, CEITEC, Masaryk University, Kamenice 5, Brno 62500, Czech Republic,

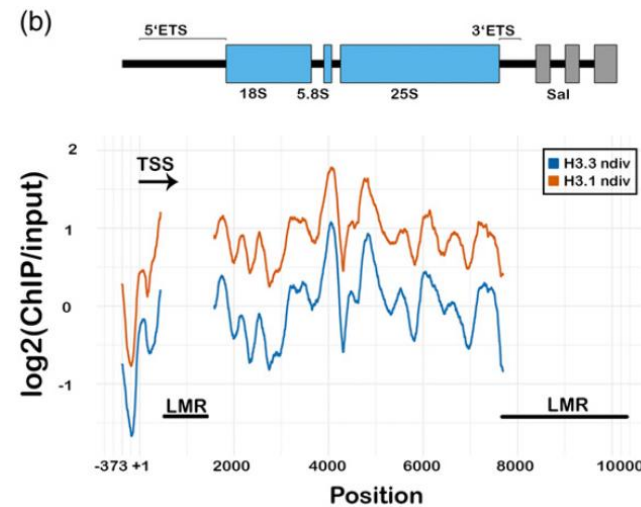
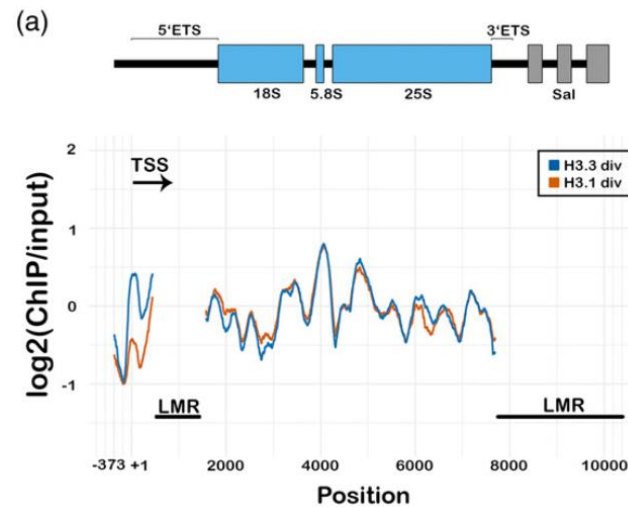
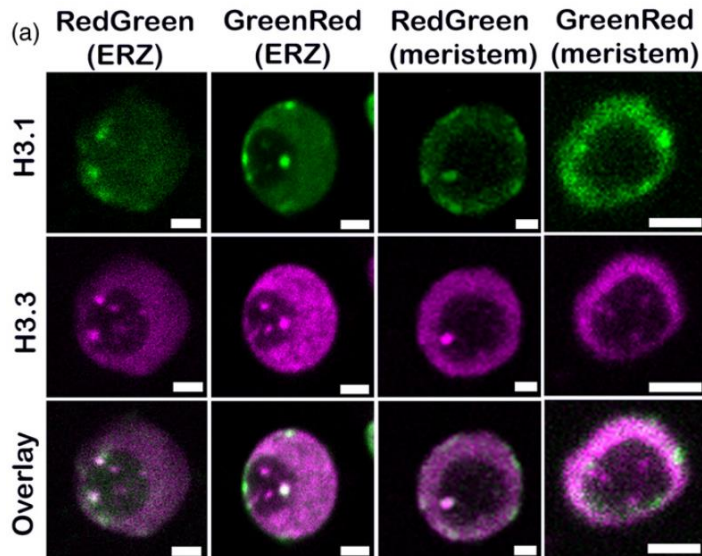
²Laboratory of Functional Genomics and Proteomics, National Centre for Biomolecular Research, Faculty of Science, Masaryk University, Kotlářská 2, Brno 61137, Czech Republic,

³Department of Cell and Molecular Biology, Uppsala University, Uppsala 751 24, Sweden,

⁴Department of Immunology, Genetics and Pathology, Uppsala University, Uppsala 751 08, Sweden,







⁵Institute of Computer Science, Polish Academy of Sciences, Warsaw 012-48, Poland, and

⁶BioCEV Imaging Methods Core Facility, Průmyslová 595, Vestec 252 50, Czech Republic

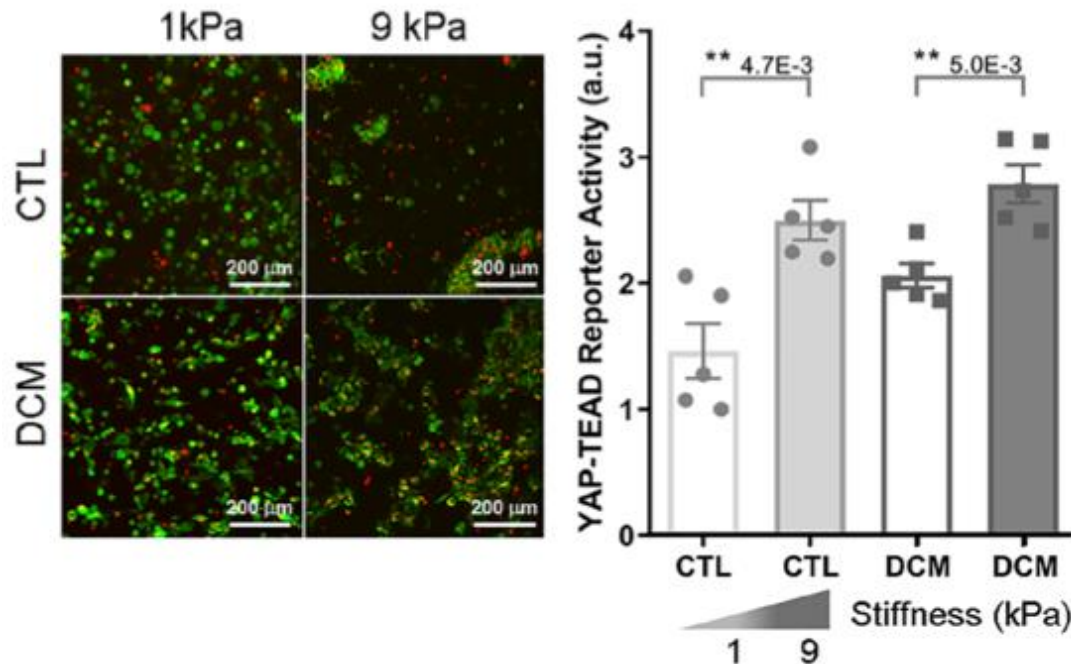




Multiscale Analysis of Extracellular Matrix Remodeling in the Failing Heart

Ana Rubina Perestrelo, Ana Catarina Silva, Jorge Oliver-De La Cruz , Fabiana Martino, Vladimír Horváth, Guido Caluori , Ondřej Polanský, Vladimír Vinarský, Giulia Azzato, Giuseppe de Marco, Vítá Žampachová, Petr Skládal, Stefania Pagliari, Alberto Rainer , Perpétua Pinto-do-Ó , Alessio Caravella, Kamila Koci, Diana S. Nascimento , Giancarlo Forte 

Correspondence to: Ana Rubina Perestrelo, International Clinical Research Center, St. Anne's University Hospital, Studentská 6, 62500 Brno, Czech Republic, Email anarubiperestrelo@gmail.com or Giancarlo Forte, International Clinical Research Center, St. Anne's University Hospital, Studentská 6, 62500 Brno, Czech Republic, Email giancarlo.forte@fnusa.cz





Article

<https://doi.org/10.1038/s41467-022-33305-w>

Tail proteins of phage SU10 reorganize into the nozzle for genome delivery

Received: 31 January 2022

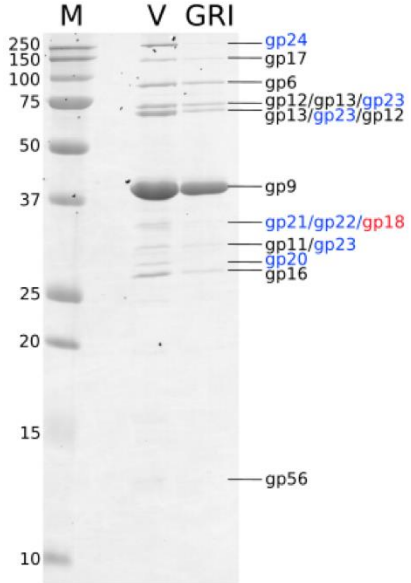
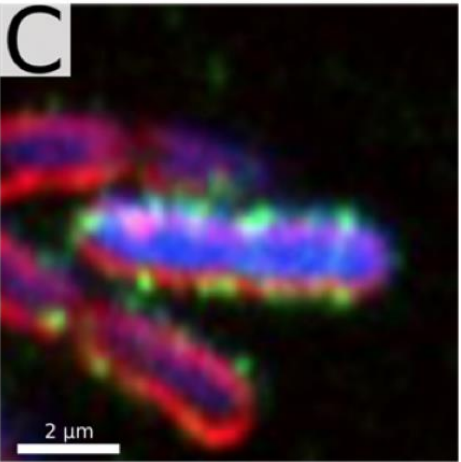
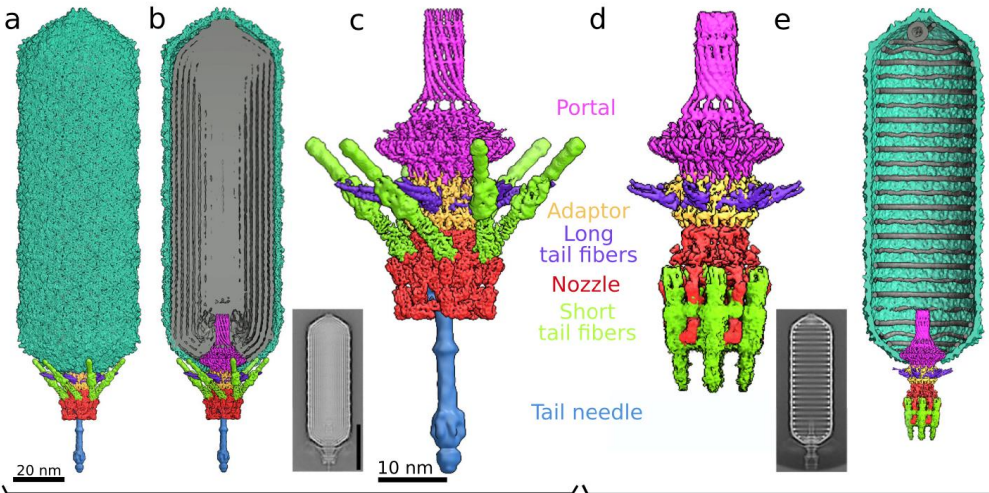
Accepted: 12 September 2022

Published online: 24 September 2022

Check for updates

Marta Šiborová ¹, Tibor Füzik ¹, Michaela Procházková ¹, Jiří Nováček ¹,
Martin Benešík², Anders S. Nilsson ³ & Pavel Plevka ¹ ✉

Escherichia coli phage SU10 belongs to the genus *Kuravirus* from the class *Caudoviricetes* of phages with short non-contractile tails. In contrast to other



Long term vision + strategy

- **Anticipate developments in research methods:**
 - Promote integrative services – analyses of samples by multiple CFs.
 - Reflect in future purchases of instruments.
- Expand support provided to users in **data analyses**.
- Strategy to handle increased amounts of **recorded data & open data** – BioData CF.
- Strategy to maintain / discontinue depreciated but useful instruments (risk management).
- **HR strategy** of CF focused on staff retainment and development/training.
- Implementation of **electronic tools** for data management and communication with users.

Acknowledgments (1):



Jiří Nováček



Radovan Fiala



Zbyněk Zdráhal



Josef Houser



Jaromír Marek



Jan Příbyl



Michal Miki



Markéta Pernisová



Boris Tichý



Milan Ešner



Panagiotis Alexiou



Radka Svobodová

Acknowledgments (2):

CF administration team

Kateřina Hořková
Core Facilities and
Research Infrastructure
Specialist



Radka Kejmarová
Administrator -
monitoring,
reporting, internal
invoicing



Pavla Pospíšilova
Administrator -
external invoicing



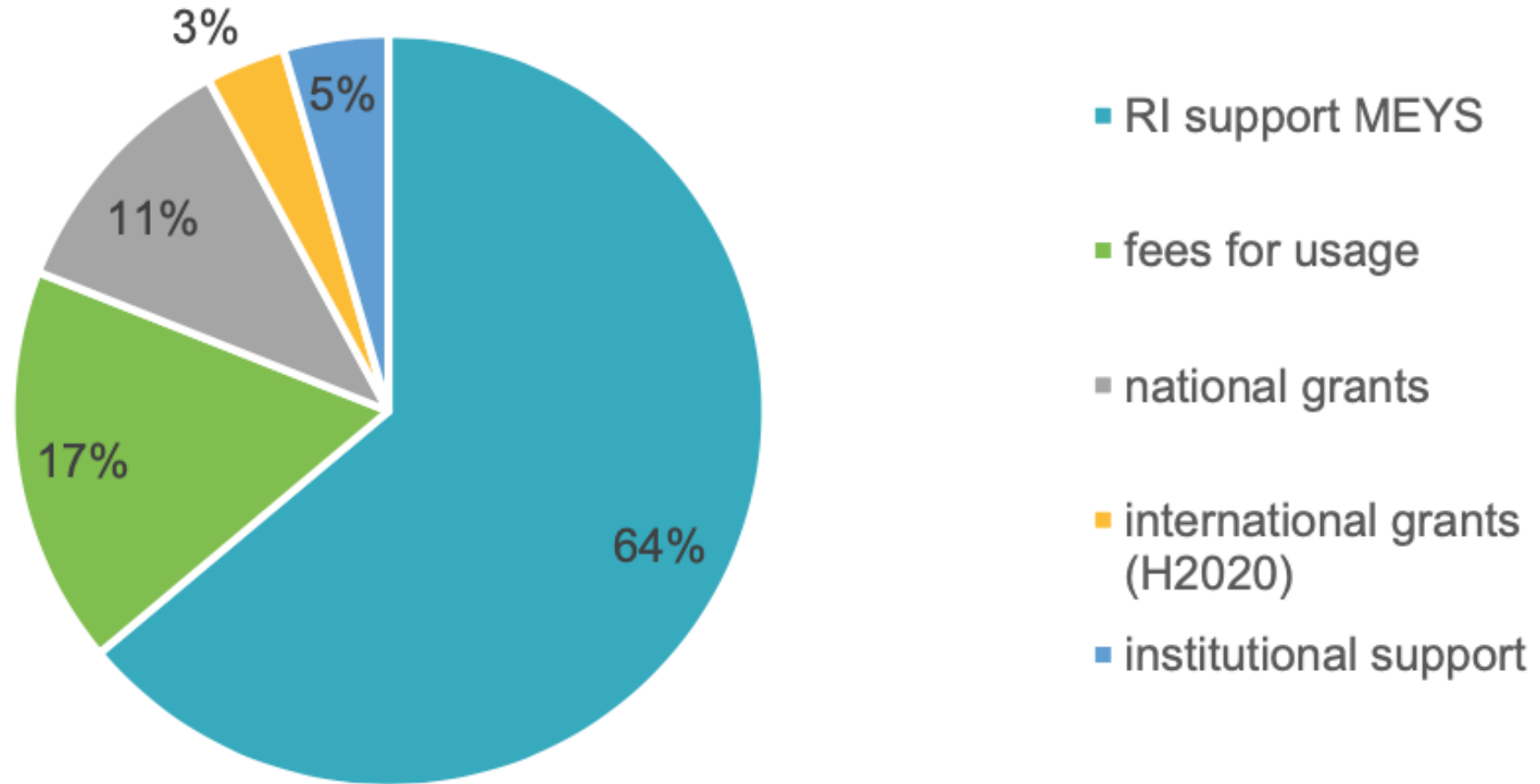
Tomáš Bártek
Booking system
administration,
technical support



Daria Kuchařová
Project manager - Horizon
projects

Operation costs 3.3 million EUR in 2021

- RI support is major source of financing of CEITEC CFs.
- Current project scheme ends 12/2022.
- New projects for the period 2023-2026 are expected to be reduced to 75-50% of the requested budget
- CFs participate in **15 national** and **8 international projects**
- In 2020 – 2021, almost **300 million CZK / 11.3 million EUR** was invested in new technologies and instrument upgrades thanks to OP VVV projects



Thank you for your attention

- In the case of questions, contact us at: core.facilities@ceitec.muni.cz
- Follow the webpage: <https://www.ceitec.eu/core-facilities/>



CEITEC



@CEITEC_Brno



CEITEC

General debate