

Biology Centre of CAS – Institute of Parasitology and Faculty of Science – Institute of Physics and Biophysics, University of South Bohemia, České Budějovice, Czech Republic

# Biological Specimens in Electron Microscopes

4. - 8. 10. 2021 České Budějovice

Information

Programme

Registration and contact

Venue and accommodation



## Description

This practical course is focused on the advanced methods of biological specimen preparation for electron microscopy. The main goal is to make participants familiar with the theoretical background and the latest practical developments in this field. The programme includes state of the art fixation, including cryo-methods, cutting of ultrathin sections from embedded or frozen samples, methods of negative staining and immunolabeling, specimen preparation for transmission and scanning electron microscopy and methods of specimen preparation for 3D electron microscopy (single particle analysis, electron tomography, array tomography and serial block-face). The results will be evaluated using electron microscopes.

The course is limited to 15 participants. It is intended for Master and PhD students, young researchers, technicians, and new EM users.

This course is supported by the program for large research infrastructures of the Ministry of Education, Youth and Sports within the project “National Infrastructure for Biological and Medical Imaging (**Czech-BioImaging** –LM2018129)“.

### Organisers:

[Marie Vancová](#) (Laboratory of EM, Biology Centre CAS, České Budějovice)



Since 2021, the head of the LEM. The LEM provides state-of-art support for users to address different biological questions and access electron microscopy technology, including cryo-techniques. Her scientific interests focus on EM investigation of the structure of tissues and cells using various methods/techniques, including cryo techniques, 3D reconstructions, and immunolocalisation of molecules. She participated as a speaker and/or instructor in practical courses (Electron Microscopy and Stereology in Cell and Molecular Biology, EMBO Practical Course), workshops, etc. Lecturing experience in Electron microscopy at Faculty of Science, University of South Bohemia.

[Jana Nebesářová](#) (Laboratory of EM, Biology Centre CAS, České Budějovice)



The head of the LEM for more than 20 years. Her research interests cover particularly biological specimen preparation for electron microscopy. She has long lecturing experience at Master/Doctoral level in Electron Microscopy Techniques and Methods at Faculty of Science, South Bohemia University, Charles University; co-organisation/speaker at EMBO practical EM courses, workshops, and other courses.

## Information Programme Registration and Contact Venue and Accommodation

### Invited speakers:

[Vladislav Krzyžánek](#) (Institute of Scientific Instruments CAS, Brno)



Group leader of Microscopy of Biomedicine focusing on quantitative imaging by STEM (mass-thickness measurement by electron scattering), low-temperature scanning electron microscopy (cryo-SEM), correlation of signals in electron microscopy.

[Oldřich Benada](#) (Institute of Microbiology CAS, Prague)



Head of the EM group. He is generally interested in electron microscopy in microbiology (TEM, SEM, STEM) and visualisation of the macromolecules and macromolecular complexes.

[Jiří Týč](#) (Laboratory of EM, Biology Centre CAS, České Budějovice)



His main research interest is BIOIMAGING. He got his PhD in molecular biology, and during his postdoc at the Bioimaging unit at Oxford Brookes University (UK), he started with 3D EM. He focuses on electron microscopy, but he has experience also with confocal and high-resolution fluorescence microscopy. He specialises in 3D SEM techniques such as SBF-SEM (serial block-face scanning electron microscopy) and array tomography.

[Zdeno Gardian](#) (Macrocomplex group, South Bohemia University & Biology Centre of the CAS, České Budějovice)



His research interests are single-particle and image analysis, structural studies of photosynthetic reaction centres and light-harvesting complexes.

## Information Programme Registration and Contact Venue and Accommodation

[Tomáš Bílý](#) (Macrocomplex group, South Bohemia University & Biology Centre of the CAS, České Budějovice)



His research interests are electron tomography, image processing, 3D visualisation of cells, purified organelles and viruses.

### **Instructors:**

Mgr. František Kitzberger, Mgr. Martina Tesařová, Mgr. Eva Ďurinová Petra Masařová, Jiří Vaněček

# Programme

## **Monday**

13:00	Welcome Address	Marie Vancová
13:10	Principles of transmission electron microscopy	Oldřich Benada
14:00	Overview of TEM sample preparation methods	Jana Nebesářová
14:45	Coffee break	
15:05	How to visualise macromolecules in TEM	Oldřich Benada
16:00	Room temperature sectioning	Jana Nebesářová

## **Tuesday**

8:30	Cryo methods in sample preparation	Marie Vancová
9:15	Principles of scanning electron microscopy	Vladislav Krzyžánek
10:00	Coffee break	
10:20	Immunogold labeling	Marie Vancová
11:15	Specimen preparation for SEM	Jana Nebesářová
12:00	Lunch	
13:00	Practicals	
19:00	Course dinner	

## **Wednesday**

8:30	Electron tomography	Tomáš Bílý
9:30	Serial block-face SEM, array tomography	Jiří Týč
10:20	Coffee break	
10:40	Introduction to image processing	Zdeno Gardian
11:25	Cellular ultrastructure and interpretation of images	Marie Vancová
12:10	Lunch	
13:00	Practicals	

## **Thursday**

8:30	Practicals	
12:00	Lunch	
13:00	Practicals	

## **Friday**

8:30	Practicals	
12:00	Lunch	
13:00	Round table discussion	

# Registration

## Registration Fees

CSMS member: 6000 CZK

CSMS non-member: 7000 CZK

Industry: 10000 CZK

The course fee includes admission, the course materials, meals and coffee breaks

**[For registration click here](#)**

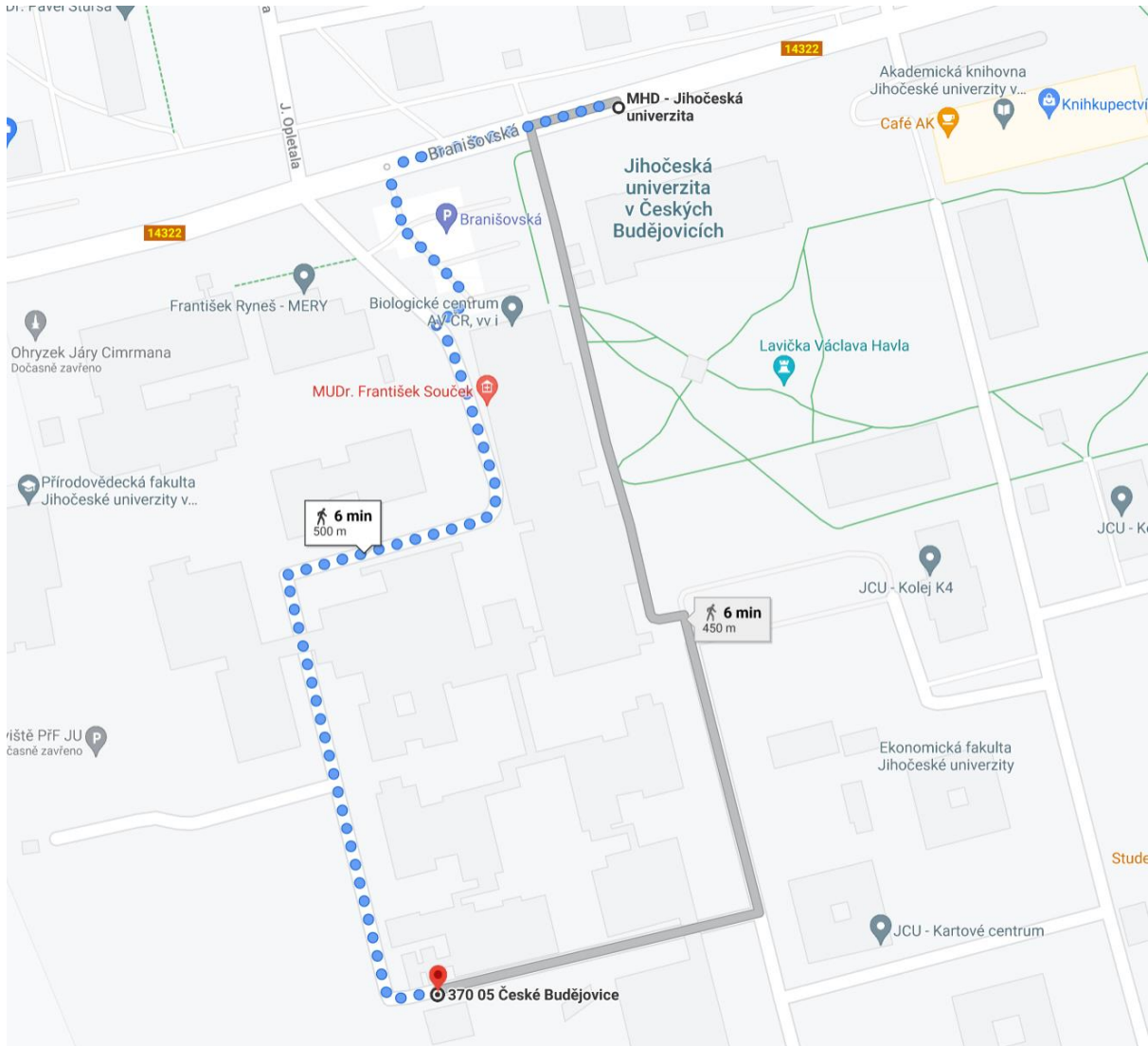
Contact: **[Martina Tesařová](mailto:holland@paru.cas.cz)** (**[holland@paru.cas.cz](mailto:holland@paru.cas.cz)**)

# Venue and Accommodation

## Venue

Laboratory of Electron Microscopy, Biology Centre ASCR - Institute of Parasitology

Branisovska 31, 370 05, Ceske Budejovice, Czech Republic



(Click on the map to open in the browser)

GPS

Loc.: 48.97609487481923, 14.447112729646566

## **Information Programme Registration and Contact Venue and Accommodation**

### **How to get to the venue**

By public transport:

From the train station of the bus station, go the bus stop located under the Mercury shopping centre and take bus No. 3 in direction Máj – Antonína Barcala and get off at the bus stop Jihočeská Univerzita. Then cross the street to the university campus and from go to the building of the laboratory.

By car:

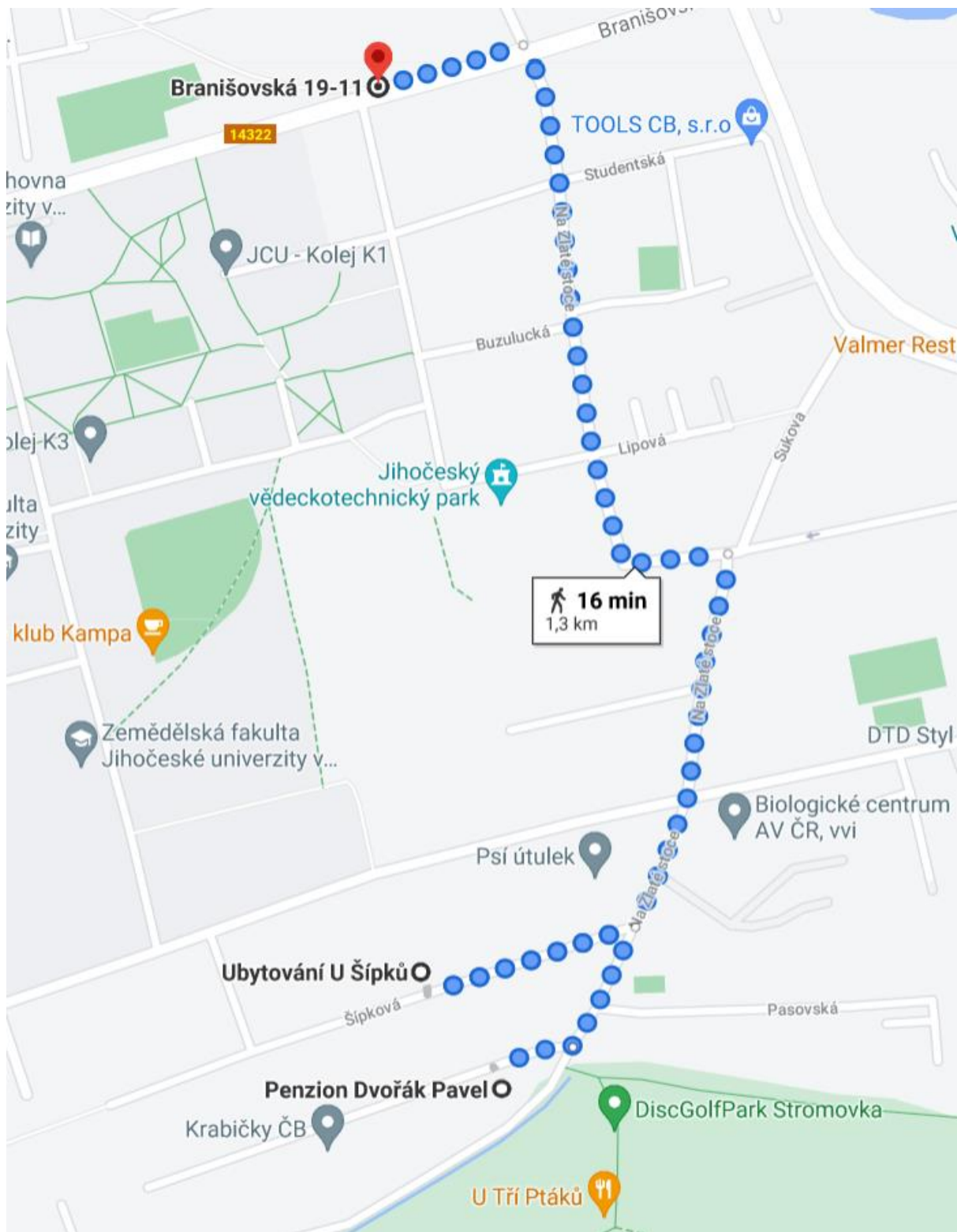
In case you plan to get here by the car, go to the address: Branisovska 31, 370 05, České Budejovice. You can park your car on the parking lot at the Biology Centre. (ring at the gate and tell that you participate on this course if asked). Other parking possibility is at the recommended accommodation site.

### **Accommodation**

You can arrange your accommodation either in the Penzion U Šípku (contact person: Marie Hloušková, +420 604 375 441, [usipku.cb@seznam.cz](mailto:usipku.cb@seznam.cz)), or in the Penzion Dvořák (+420 721 810 410, [PenzionDvorak@email.cz](mailto:PenzionDvorak@email.cz)). Both of the pensions are located within 15 minutes of walk from the venue. For closer information see the map.

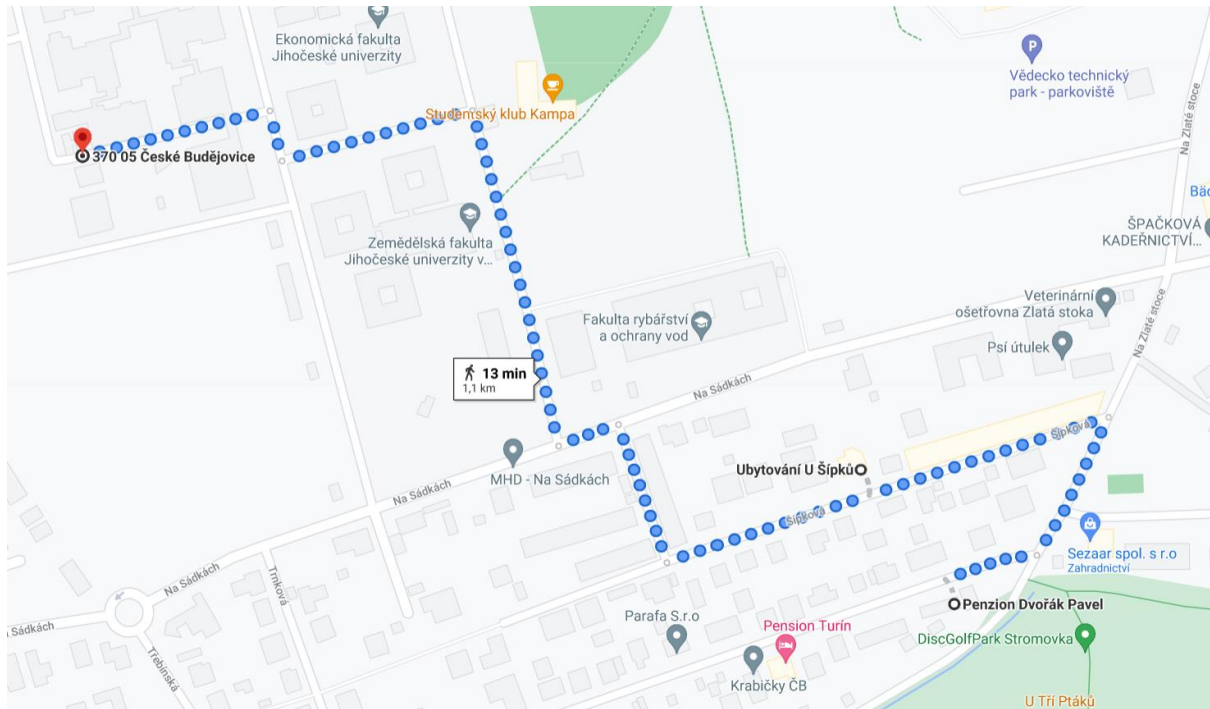


**How to get from the bus stop to the accomodation**



(Click on the map to open in the browser)

## How to get from your accommodation to the venue



(Click on the map to open in the browser)