

---

# IOCB SERVICE DAYS

20  
23

Presentation of services by:  
Research-Service Groups / Service Groups / Core Facilities

---

## Microscopy Research Core Facility

Jana Humpolíčková, Petro Khoroshyy



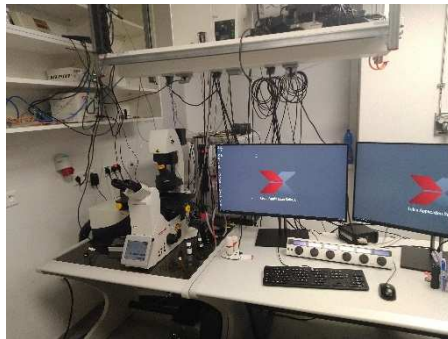
ÚOCHB AV  
CR  
IOCB PRAGUE



# Who we are?

- Jana Humpolickova: [jana.humpolickova@uochb.cas.cz](mailto:jana.humpolickova@uochb.cas.cz) C4.02
- Petro Khoroshyy: [petro.khoroshyy@uochb.cas.cz](mailto:petro.khoroshyy@uochb.cas.cz) A01.77

## Equipment:



### **Leica SP8:**

WLL, Pulsed + cw lasers  
Falcon systems: FLIM  
Fluorescence correlation spectroscopy (FCS)



### **Zeiss 980:**

Airy scan: speed,  
resolution, background  
suppression  
Temperature/CO<sub>2</sub> control



### **Zeiss 780:**

Camera for wide field  
imaging  
FLIM, FCS  
Temperature/CO<sub>2</sub> control

# Services:

- Help with standard imaging (setting up the machine), start of the experiment
- Walk-in help
- Organizing trainings
- Maintenance of the microscope
- Help with software or data evaluation
- Special workshops: FLIM
- Full support for advanced techniques: FLIM, FCCS

# Standard services in more detail:

- Confocal imaging: time series, tiled scans, z-stacks, sample navigation
- Biological long-term imaging under temperature/CO<sub>2</sub> control
- Spectral imaging and deconvolution
- Fluorescence recovery after photo bleaching
- Airy scan: fast acquisition/better resolution/background suppression
- Wide field imaging

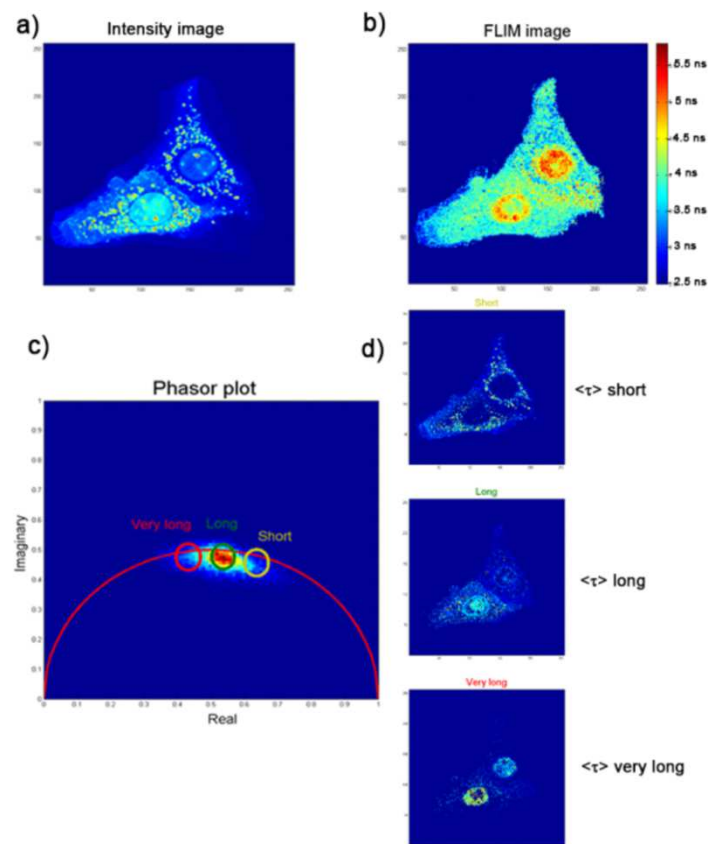
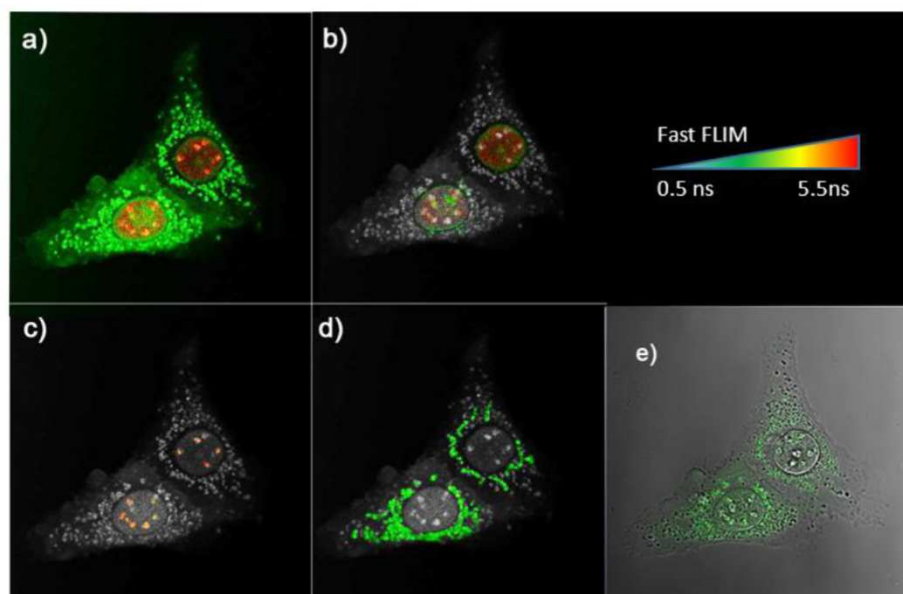
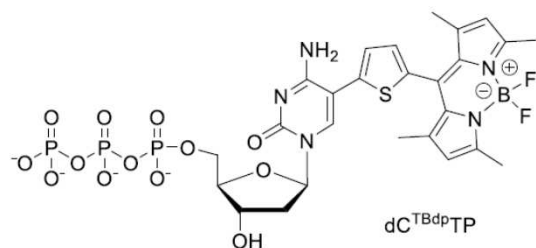
# Advanced services in more detail:

- FLIM/FCCS
  - Design of experiments
  - Help with acquisition
  - Help with data evaluation
  - Workshops, individual trainings

FLIM: lifetime based sensors, FRET sensors, protein-protein interactions

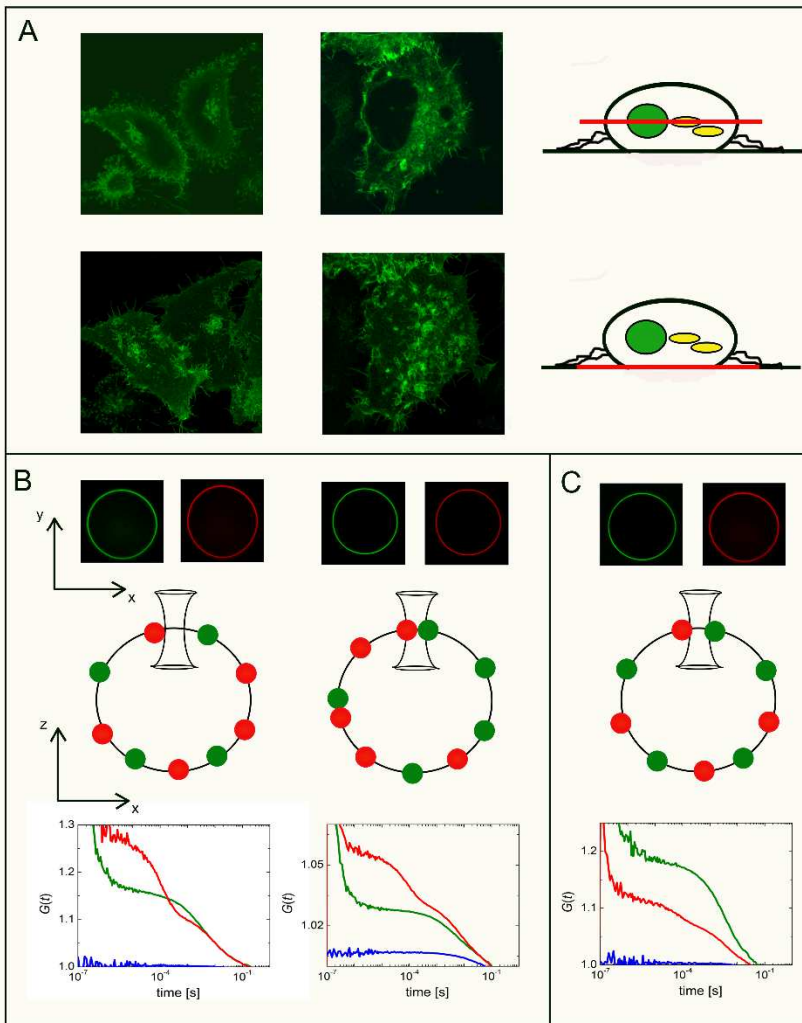
FCCS: molecular dynamics in solution, membrane bilayers, cells. Molecular interactions in vitro/ in vivo

# Example of FLIM



Guixens-Gallardo, P.; Humpolickova, J.; Miclea, S. P.; Pohl, R.; Kraus, T.; Jurkiewicz, P.; Hof, M.; Hock, M., Thiophene-linked tetramethylbodipy-labeled nucleotide for viscosity-sensitive oligonucleotide probes of hybridization and protein-DNA interactions. *Org Biomol Chem* **2020**, *18* (5), 912-919.

# Example of FCCS



Monitoring protein-protein interaction  
in membrane environment:

- In plasma membrane
- In Giant Plasma Membrane Spheres

Skerle, J.; Humpolickova, J.; Johnson, N.; Rampirova, P.; Polachova, E.; Fliegl, M.; Dohnalek, J.; Suchankova, A.; Jakubec, D.; Strisovsky, K., Membrane Protein Dimerization in Cell-Derived Lipid Membranes Measured by FRET with MC Simulations. *Biophys J* **2020**, *118* (8), 1861-1875.

# How to reach the facility

- Jana Humpolíčková: [jana.humpolickova@uochb.cas.cz](mailto:jana.humpolickova@uochb.cas.cz)  
line: 477, room: C 4.02
- Petro Khoroshyy:  
[petro.khoroshyy@uochb.cas.cz](mailto:petro.khoroshyy@uochb.cas.cz)  
line: 448, room: A 01.07

Booking of the microscopes is available via IOCB booking system:

<https://mab.uochb.cas.cz/booked/Web/schedule.php>