FACULTY OF SCIENCE
Charles University

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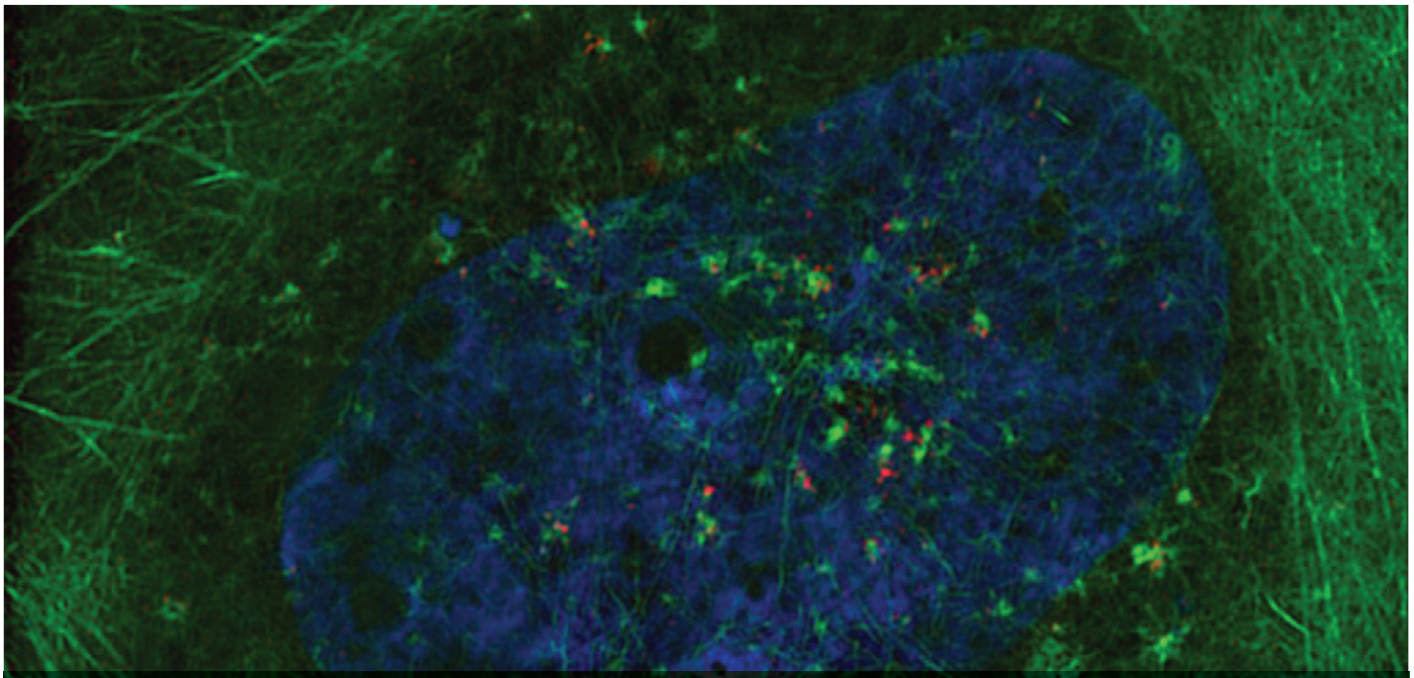

LABORATORY OF MOLECULAR GENETICS OF DEVELOPMENT

OFFER

We are looking for meaningful partnerships with academic and private institutions. The quickest way to discuss a partnership with us is to contact us and ask. We prefer meaningful discovery-driven collaborations with responsible and reliable partners.

We have considerable expertise in the following:

- Characterisations of intracellular trafficking pathways of your protein or drug of interest – following the cargo inside cells using various microscopic approaches
- Genetic studies in *C. elegans* – using our library of siRNA, we are able to study the effects of gene silencing on physiological processes in *C. elegans*

KNOW-HOW & TECHNOLOGIES

The two models used in our laboratory are human cell lines and the "worm" – *Caenorhabditis elegans*. The findings in one of the models can be quickly verified in the other – human cell lines provide clinical relevance while the worm is an excellent and easy-to-grow animal model to study the influence of various pathways on organ development.

Our experimental work combines two principal approaches: the fluorescent microscopic observation of cells and proteomic work. Microscopy, including advanced live imaging and super-resolution techniques, is used to understand the localisation of proteins of interest and their transport across cells. We are able to pinpoint proteins to precise vesicular subcompartments inside cells. Our biochemical methodology involves the studies of protein-protein interactions including mass spectrometry.

We strive to understand the dynamic process of **vesicular trafficking** by studying the intricate molecular interactions at the endosomal surface.

KEY RESEARCH EQUIPMENT

As part of the Department of Cell Biology, we have easy access to a wide array of laboratory equipment. This includes the Laboratory of Confocal and Fluorescent Microscopy, where we regularly operate the Olympus Scan^R wide-field microscope, Zeiss LSM 880 confocal microscope and Zeiss Elyra SP.1 super-resolution microscope. We also regularly make use of the laboratory of cytometry and laboratory of mass spectrometry, the latter of which has an Orbitrap system for the analysis of complex samples. Other equipment at our disposal includes a sequencing lab, cell culture and *C. elegans* cultivation rooms as well as an ultracentrifuge, Varioskan fluorometer, LAS camera system for the detection of chemiluminescence and other biochemical equipment.

PARTNERSHIPS & COLLABORATIONS

ACADEMIC PARTNERS

- Kateřina Schwarzerová – Faculty of Science, Charles University, Prague
- Zdeněk Lánský – BIOCEV, Vestec u Prahy
- Robert Insall, Laura Machesky – Beatson Institute for Cancer Research, Glasgow, Cancer Research UK

ACHIEVEMENTS

- Publications in respected international journals.

FOR MORE DETAILS VISIT OUR WEBPAGES:

https://www.natur.cuni.cz/biology/cell-biology/research-teams/laboratory-of-molecular-genetics-of-development

Pictures: Title on 1st page: U2-Os human cell line stained for actin (green), endosomes (red) and nucleus (blue). | On top: Adult nematode *Caenorhabditis elegans* with some of amphid and phasmid neurons visualized with the fluorescent dye DiI. Amphids and phasmid are mostly chemosensory neurons located in the nematode head and tail. Head of the worm is to the left. | In the bottom: U2-Os cells stained for glucose transporter 1 (GLUT1, green) and nuclei (Hoechst 33258, blue). Left: cells treated with Vps35 siRNA are unable to recycle GLUT1 towards the cell surface, leading to accumulation in lysosomes, right: control cells. Image: Zeiss Elyra; Olympus Cell^R.