Mgr. Eliška Kuthanová, PhD

Photosynthesis Researcher | Photosynthetic Membrane Biology & Biophysics

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Results: Peer-reviewed publications: 12, H-index (WOS): 8

Profile: Researcher with expertise in photosynthetic membrane systems, antenna proteins, fluorescence spectroscopy, and membrane protein biochemistry. Experienced in the functional and biophysical characterization of photosynthetic complexes in algae and related model organisms, including isolation and in vitro reconstitution of pigment–protein complexes. Currently expanding research focus toward cyanobacterial photosynthesis, thylakoid membrane organization, and genetically encoded biosensors in Synechocystis PCC 6803. Experienced in interdisciplinary collaborations combining biophysics, microscopy, physiology, and molecular biology.

Education

- **PhD in Plant Physiology (2015–2020)** University of South Bohemia, České Budějovice, Czech Republic, Dissertation: *Regulation of photochemical activity in pigment–protein complexes of the thylakoid membrane*. Supervisor: Mgr. Radek Kaňa, PhD
- **MSc in Genetics (2013–2015)** University of South Bohemia, České Budějovice, Czech Republic, Thesis: *Mechanisms of photoprotection in photosynthetic proteins*. Supervisor: Mgr. Radek Kaňa, PhD
- **BSc in Biological Chemistry (2010–2013)** Johannes Kepler University Linz, Austria, *Thesis: Purification of isotopically labelled PsbP from Spinacia oleracea*
- **BSc in Biological Chemistry (2010–2013)** University of South Bohemia, České Budějovice, Czech Republic, *Thesis: Organic pollutants in constructed wetlands*

Research Experience

- **Postdoctoral Researcher** (until September 2020; followed by parental leave), *Laboratory of Photosynthesis, Centre ALGATECH, Třeboň, Czech Republic,* Functional and biophysical characterization of photosynthetic antenna and thylakoid membrane protein complexes; Isolation and purification of membrane protein complexes using gradient ultracentrifugation and chromatographic approaches; In vitro analysis of pigment–protein complexes; Fluorescence spectroscopy, microscopy-based approaches, and quantitative data analysis; Current involvement in cyanobacterial photosynthesis and thylakoid membrane organization projects

- **Research Assistant** (2014–2020), *Laboratory of Photosynthesis, Centre ALGATECH, Třeboň, Czech Republic,* In vivo and in vitro studies of photosynthetic proteins in algae and cyanobacteria-related model systems; Isolation and purification of membrane protein complexes including sucrose gradient separations; Experimental work with photosynthetic membrane systems and antenna proteins; Contribution to experimental design, data analysis, manuscript preparation, and collaborative projects
- **Team member of grant-Funded Research Projects** *Photoprotective antenna protein dynamics: from live cells to algal proteoliposomes* Czech Science Foundation (GAČR 17-02363Y); *Mobility of photosynthetic proteins* Czech Science Foundation (GAČR P501-12-0304)

International Experience & Collaborations

- Visiting researcher, Prof. Alexander V. Ruban Laboratory, Queen Mary University of London, UK (1 month, 2017)
- Short-term research stay, Prof. Alexander V. Ruban Laboratory, Queen Mary University of London, UK (2 weeks, 2014)
- International Bachelor Programme in Biological Chemistry, Johannes Kepler University Linz, Austria (three semesters, 2010–2013)

Grants, Fellowships & Awards

- GAJU Scholarship for individual PhD research project (2018)
- FEBS Short-Term Fellowship, Queen Mary University of London (2017)
- GAJU Scholarship for individual research project (2016)
- Rector's Award for Outstanding Academic Results, University of South Bohemia (2015)
- Top-Up Scholarship of Excellence – Innovatives Oberösterreich 2010 PLUS (2013)

Publications

1. Crepin, A.; Belgio, E.; Šedivá, B.; **Kuthanová Trsková, E.**; Cunill-Semanat, E.; Kaňa, R. (2022). Size and fluorescence properties of algal photosynthetic antenna proteins estimated by microscopy. *International Journal of Molecular Sciences, 23, 778*.
2. Crepin, A.; Cunill-Semanat, E.; **Kuthanová Trsková, E.**; Belgio, E.; Kaňa, R. (2021). Antenna protein clustering in vitro unveiled by fluorescence correlation spectroscopy. *International Journal of Molecular Sciences, 22, 2969*.

3. Šebelík, V.; West, R.; **Kuthanová Trsková, E.**; Kaňa, R.; Polívka, T. (2020). Energy transfer pathways in the CAC light-harvesting complex of *Rhodomonas salina*. *Biochimica et Biophysica Acta (BBA) – Bioenergetics, 11, 1861*
4. Streckaite, S.; Macernis, M.; Li, F.; **Kuthanová Trsková, E.**; et al. (2020). Modeling dynamic conformations of organic molecules: alkyne carotenoids in solution. *Journal of Physical Chemistry A, 124, 2792–2801*.
5. Kaňa, R.; Kotabová, E.; Šedivá, B.; **Kuthanová Trsková, E**. (2019). Photoprotective strategies in the motile cryptophyte alga Rhodomonas salina. *Folia Microbiologica, 64, 691–703*.
6. **Kuthanová Trsková, E.**; Bína, D.; Santabarbara, S.; Sobotka, R.; Kaňa, R.; Belgio, E. (2019). Isolation and characterization of CAC antenna proteins and photosystem I supercomplex from the cryptophytic alga Rhodomonas salina. *Physiologia Plantarum, 166, 309–319*.
7. **Kuthanová Trsková, E**.; Belgio, E.; Yeates, A. M.; Sobotka, R.; Ruban, A. V.; Kaňa, R. (2018). Antenna proton sensitivity determines photosynthetic light harvesting strategy. *Journal of Experimental Botany, 69, 4483–4493*.
8. Belgio, E.; **Trsková, E**.; et al. (2018). High-light acclimation of Chromera velia points to photoprotective NPQ. *Photosynthesis Research, 135, 263–274*.
9. Sobotka, R.; et al. (2017). Extensive gain and loss of photosystem I subunits in chromerid algae. *Scientific Reports, 7, 13214*.
10. Belgio, E.; et al. (2017). High photochemical trapping efficiency in Photosystem I from red-clade algae. *Biochimica et Biophysica Acta – Bioenergetics, 1858, 56–63*.
11. Kaňa, R.; et al. (2016). Violaxanthin inhibits non-photochemical quenching in light-harvesting antennae of Chromera velia. *FEBS Letters, 590, 1076–1085*.
12. West, R.; et al. (2016). Spectroscopic properties of the triple-bond carotenoid alloxanthin. *Chemical Physics Letters, 653, 167–172*.