

Project: Study of singlet oxygen generation by photosynthetic processes

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Host institution: University of Turku Department of Biochemistry and Food Chemistry

Mentor(s): Esa Tyystjärvi (esa.tyystjarvi@utu.fi)

Aims & subject of work:

During this short-term scientific the main aim is to initiate collaboration between the two laboratories. This visit is a good chance to let know each other, support the work together and see the availabilities and laboratory facilities in respect of the collaboration in the future. Different photosynthetic bacterial reaction center proteins were brought to Prof. Tyystjärvi's laboratory in order to investigate singlet oxygen generation by the assay developed in Turku. Both groups have interesting results and conceptions that can be helpful for each other and conduce the research on this field.

Argumentation of necessity of STSM:

This visit and collaboration would be a great opportunity, as both laboratories is highly interested in the detection and study of the singlet oxygen that is a quite important and vital subject in many biological processes as well as in photosynthesis. By this visit and collaboration we could learn and compare different detection techniques and experiences of the two laboratories.

Workplan/timeschedule followed:

- Discussion on the potential cooperation between our scientific groups and laboratories
- Design of the joint work, see the opportunities
- Checking the singlet oxygen production of carotenoid containing and carotenoid less isolated bacterial reaction centers under over-excitation conditions by specific dyes and comparing different methods for singlet oxygen detection

Main results and outcome:

Different photosynthetic bacterial reaction center proteins were studied in order to investigate singlet oxygen generation by the assay developed in Turku. We used tetramethylpiperidine (TEMP) to see the singlet oxygen production by the peptides. The efficiency of the method was checked under different conditions. We changed the parameters like RC concentration, buffer solution, time of the illumination and pH. This short term scientific mission established a good collaboration between the two laboratories. We would like to continue the work on this subject to accomplish the process of the singlet oxygen detection.