



Contribution ID: 35

Type: Oral Presentation

Investigation of carotenoid excited electronic states in the main plant light-harvesting complex (LHCII) via femtosecond pump-probe spectroscopy

Tuesday, 8 July 2014 10:00 (20 minutes)

Abstract content [http://events.saip.org.za/getFile.py/?target="_blank"](http://events.saip.org.za/getFile.py/?target=) **Formatting & Special chars**

Photosynthesis is the major solar energy storing process on earth. Understanding the molecular mechanisms underlying the efficient storage of the system may be critical for future solar energy storage devices. The natural photosynthetic apparatus consists of a complex system of membrane-bound pigment-proteins. The reaction centres of both photosystem I (PSI) and photosystem II (PSII) are surrounded by more than a hundred protein-bound chlorophylls and carotenoids which absorb the solar photons and transfer the electronic excitation to the reaction centre, where a charge separation is initiated. These ultrafast processes are at the basis of the high efficiency of light harvesting and temporal storage of the harvested energy. Plants are self-protected against damage due to over-illumination, by a natural process known as non-photochemical quenching (NPQ). The role of the embedded carotenoids in NPQ has minimal understanding. The main light harvesting complex (LHCII) will be the focal point of the presentation, due to its important involvement in the process of NPQ. An investigation to the excited-state dynamics of LHCII carotenoids upon intensity-dependent, selective carotenoid excitation was conducted through femtosecond pump-probe spectroscopy studies on LHCII trimers. It will be demonstrated that by making use of this technique, new electronic states may be resolved. It will furthermore be explained how these states may be active in energy-quenching mechanisms.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD)?

MSc

Main supervisor (name and email) and his / her institution

Supervisor: Dr. TPJ Krüger
 E-mail: Tjaart.Kruger@up.ac.za
 Institution: University of Pretoria

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

Primary author: Ms SINGH, Asmita (University of Pretoria)

Co-author: Dr KRÜGER, Tjaart (University of Pretoria)

Presenter: Ms SINGH, Asmita (University of Pretoria)

Session Classification: Applied

Track Classification: Track F - Applied Physics