Contribution ID: **246** Type: **Oral Presentation**

Plasmon-enhanced fluorescence from individual plant light-harvesting complexes

Friday, 29 June 2018 12:00 (20 minutes)

Light-harvesting complex II (LHCII) is the main antenna complex in photosystem II (PSII) of plants and serves as a model for biological multichromophoric systems with great potential in biophotovoltaic applications. However, in these applications, the use of LHCII is limited by the relatively small portion (less than 1%) of solar energy that can be absorbed by a single protein monolayer. The absorption and emission properties of LHCII can be strongly enhanced when strategically positioned near metallic nanoparticles. Here, we report on the plasmonic fluorescence intensity enhancement of individual LHCII complexes coupled to single gold nanorods (AuNRs). The AuNR-LHCII hybrids were constructed via wet chemical synthesis combined with a spin-assisted layer-by-layer technique and characterized using single molecule spectroscopy. Strong plasmonic fluorescence enhancement of individual LHCII complexes of up to 670-fold was observed. In addition, a significant reduction in fluorescence lifetime, as revealed by time-resolved measurements, and increased photostability of individual pigments were observed. These results serve as a platform for constructing inexpensive yet efficient hybrid light-harvesting devices.

Please confirm that you
have carefully read the
abstract submission instructions
under the menu item
”Call for Abstracts”
(Yes / No)

Yes

Consideration for
student awards
Choose one option
from those below.
N/A
Hons
MSc
PhD

PhD

Supervisor details
If not a student, type N/A.
Student abstract submision
requires supervisor permission:
please give their name,
 institution and email address.

Dr. Tjaart P. J. Krüger, University of Pretoria, tjaart.Kruger@up.ac.za

Primary author: Mr KYEYUNE, Farooq (University of Pretoria)

Co-authors: Mr BOTHA, Joshua (University of Pretoria); Dr DIALE, Mmantsae (University of Pretoria); Dr KRÜGER, Tjaart (University of Pretoria)

Presenter: Mr KYEYUNE, Farooq (University of Pretoria)

Session Classification: Photonics

Track Classification: Track C - Photonics