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Using single molecule spectroscopy to study the role of low-energy fluorescence bands in the photoprotection of the major plant light harvesting complex.

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Abstract content
   (Max 300 words)
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Single molecule spectroscopy (SMS) is a technique commonly used to study conformational dynamics of individual macromolecules via changes in the fluorescence. We have applied this technique to a single light-harvesting antenna complex of a plant in order to understand the molecular dynamics involved with a process called non-photochemical quenching (NPQ). Oxygenic photosynthetic organisms function optimally in low light conditions, therefore they require some regulatory processes to dissipate excess energy during the high light conditions typically present throughout the day. This regulatory process, NPQ, is crucial for the survival of the plant. NPQ has been linked to large, rapid intensity variations in the fluorescence; known as fluorescence intermittency or blinking. An important component of the thermal dissipation process, known as qE, is characterised by the appearance of low energy absorption and fluorescence bands. By mimicking the in vivo qE states of the major plant light harvesting complex the protein dynamics under qE conditions can be monitored via changes in the absorption and fluorescent spectra. In this presentation the relationship between fluorescence blinking, fluorescence lifetime and the low energy fluorescence bands (redshifts) will be discussed.

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MSc

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

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