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# Light-harvesting protein aggregation studied by real-time feedback-driven single-particle tracking spectroscopy.

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Single-molecule spectroscopy (SMS) has significantly advanced our understanding of the properties and dynamics of biomolecules. However, the environment used in SMS experiments is a poor representation of the natural cellular environment, and therefore the results of these studies may be of limited physiological relevance. One limitation of conventional SMS experiments is the need to immobilise the particles via surface attachment. This limitation is overcome by real-time feedback-driven single-particle tracking (RT-FD-SPT), a technique that allows spectroscopic measurements on individual, freely diffusing particles, with the added benefit of diffusion information. We employed RT-FD-SPT to study the aggregation of plant light-harvesting complex II (LHCII). Such aggregation is thought to be related to non-photochemical quenching (NPQ), an important photoprotective process. We combined spectroscopic and diffusion information to disentangle the interplay of aggregate size, detergent concentration, fluorescence intensity and lifetime, variables that are often overlooked in ensemble experiments.

## Apply for student award at which level:

None

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Yes, I ACCEPT

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