

## TPM2-4

### **A non-photochemical quenching mutant of *Chlamydomonas* reveals a role for LI818/LHCSR proteins.**

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Algae and plants can fine-tune the photosynthetic apparatus between a state that favors light harvesting and one that promotes the dissipation of absorbed light energy. Heterogeneity in the natural light environment requires rapid switching between these two states in order to maintain a high photosynthetic efficiency and to avoid photo-oxidative damage. We are investigating the novel mechanisms that algae use to dissipate excess light energy. *Chlamydomonas reinhardtii* is a model green alga that thrives in a variety of light environments. When these algae are grown in light fluxes  $>350 \mu\text{mol photons m}^{-2} \text{sec}^{-1}$ , their photoprotective capacity is induced (measured as the non-photochemical quenching of chlorophyll fluorescence, NPQ). The *npq4* mutant is deficient in the rapidly reversible component of NPQ, and it is missing two of three *LHCSR* genes. LHCSR (formerly known as LI818) accumulates during growth in excess light, and its expression correlates with NPQ capacity in wild-type cells. LHCSR is an ancient member of the LHC family of pigment-protein complexes that constitute the light-harvesting antennae of the photosystems. Homologs of this gene are found throughout the photosynthetic eukaryote taxa except red algae and higher plants. We will discuss the diversity and evolution of the photoprotective mechanisms that occur in plants and algae.