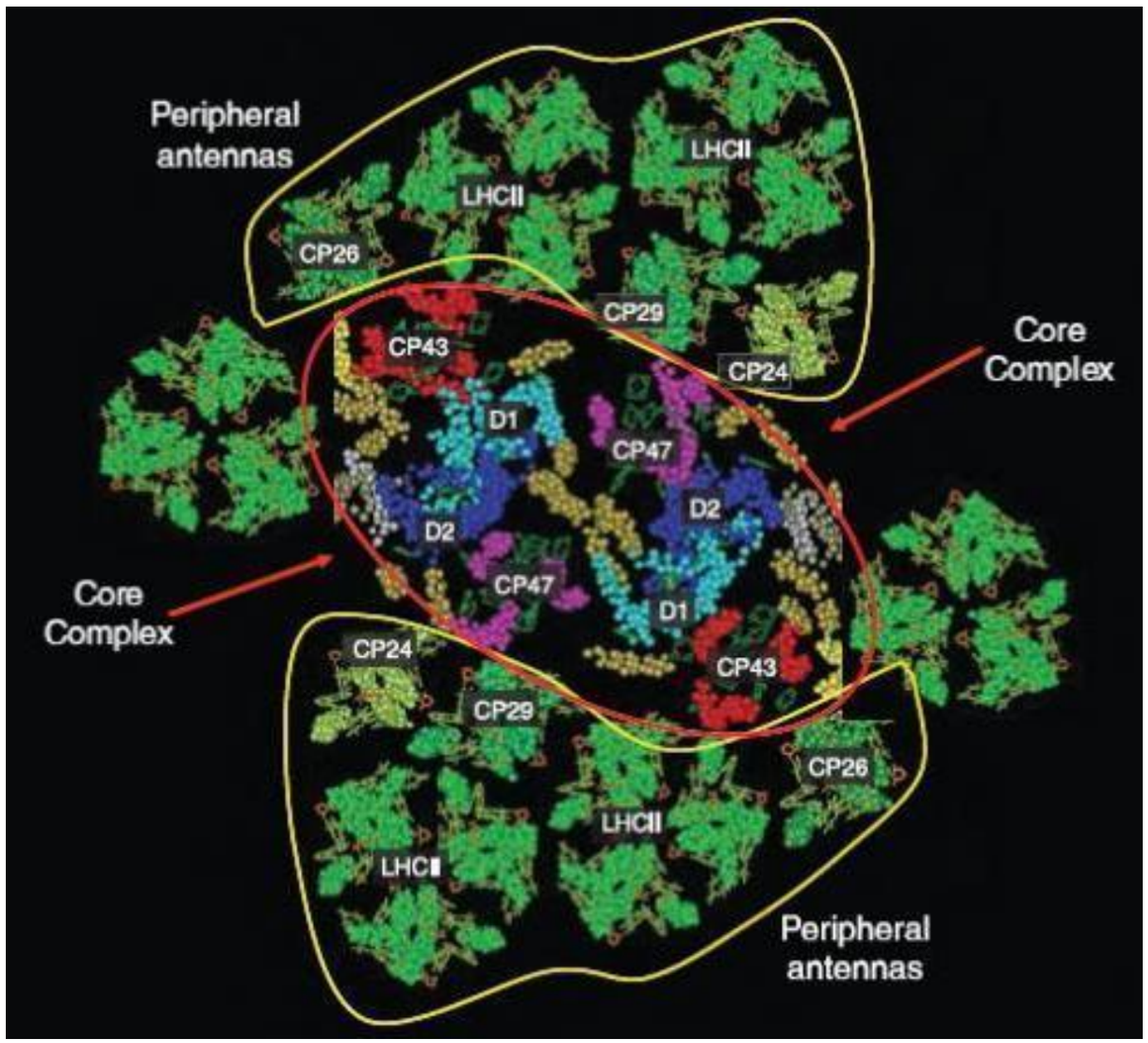
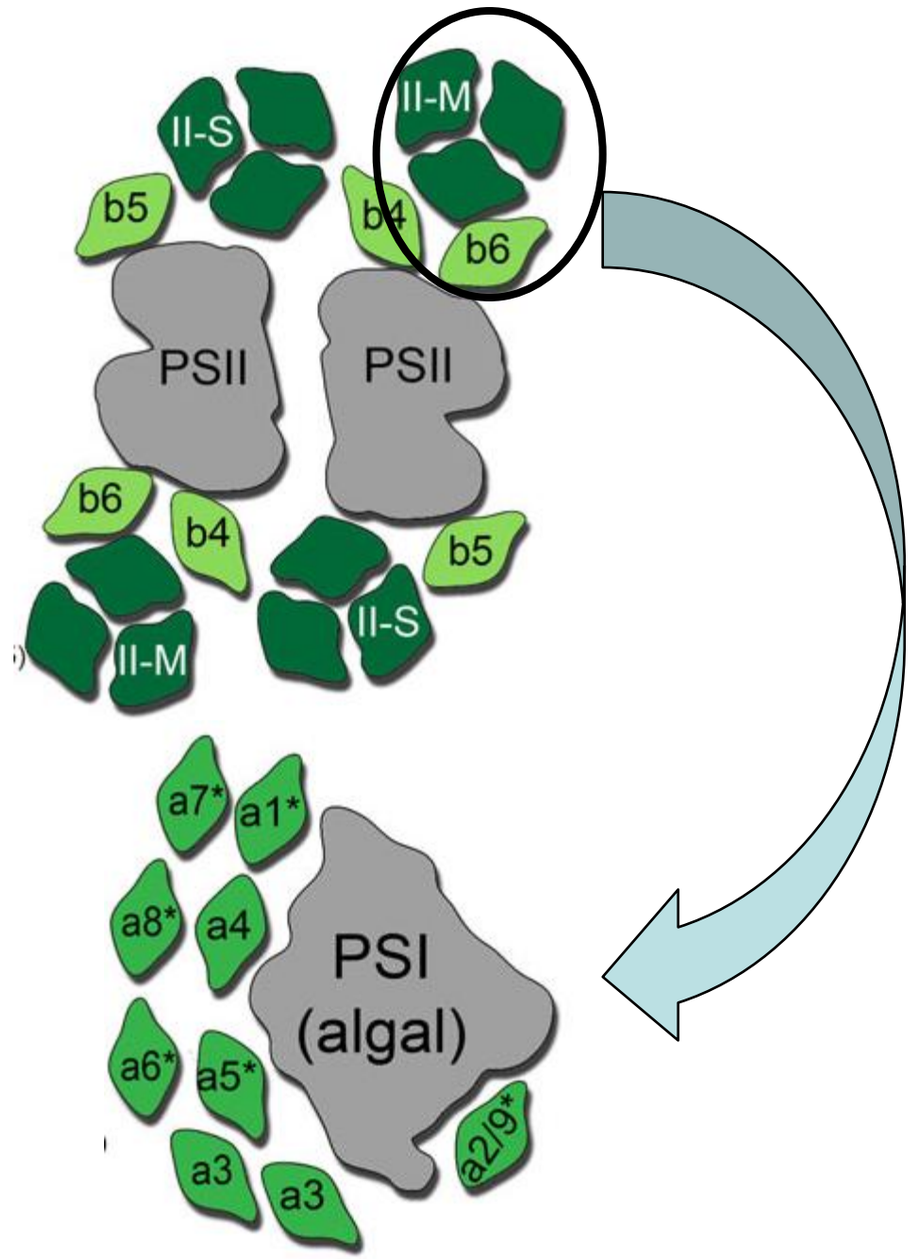
Increasing solar energy capture and conversion efficiency

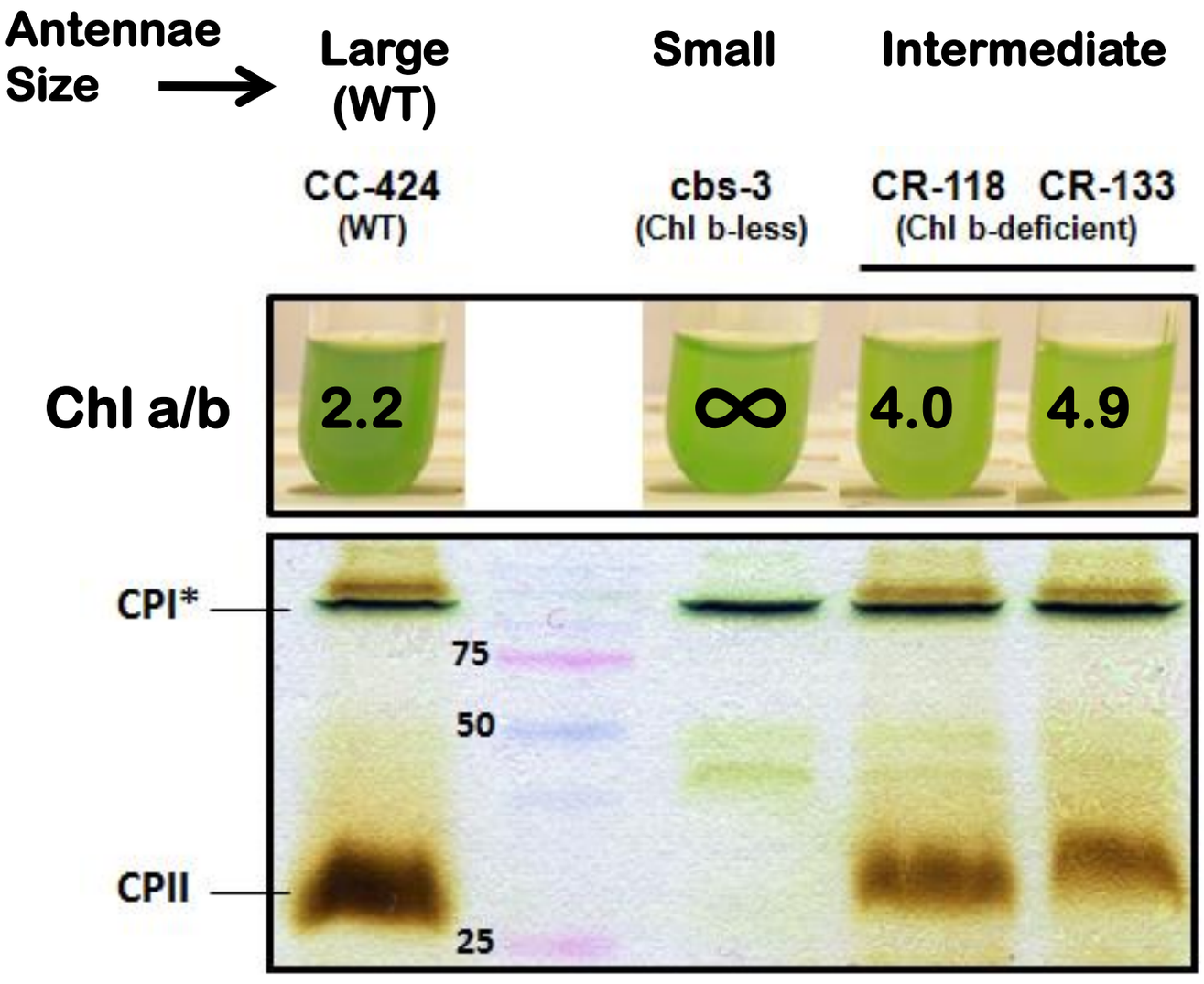
Richard Sayre, Los Alamos National Laboratory



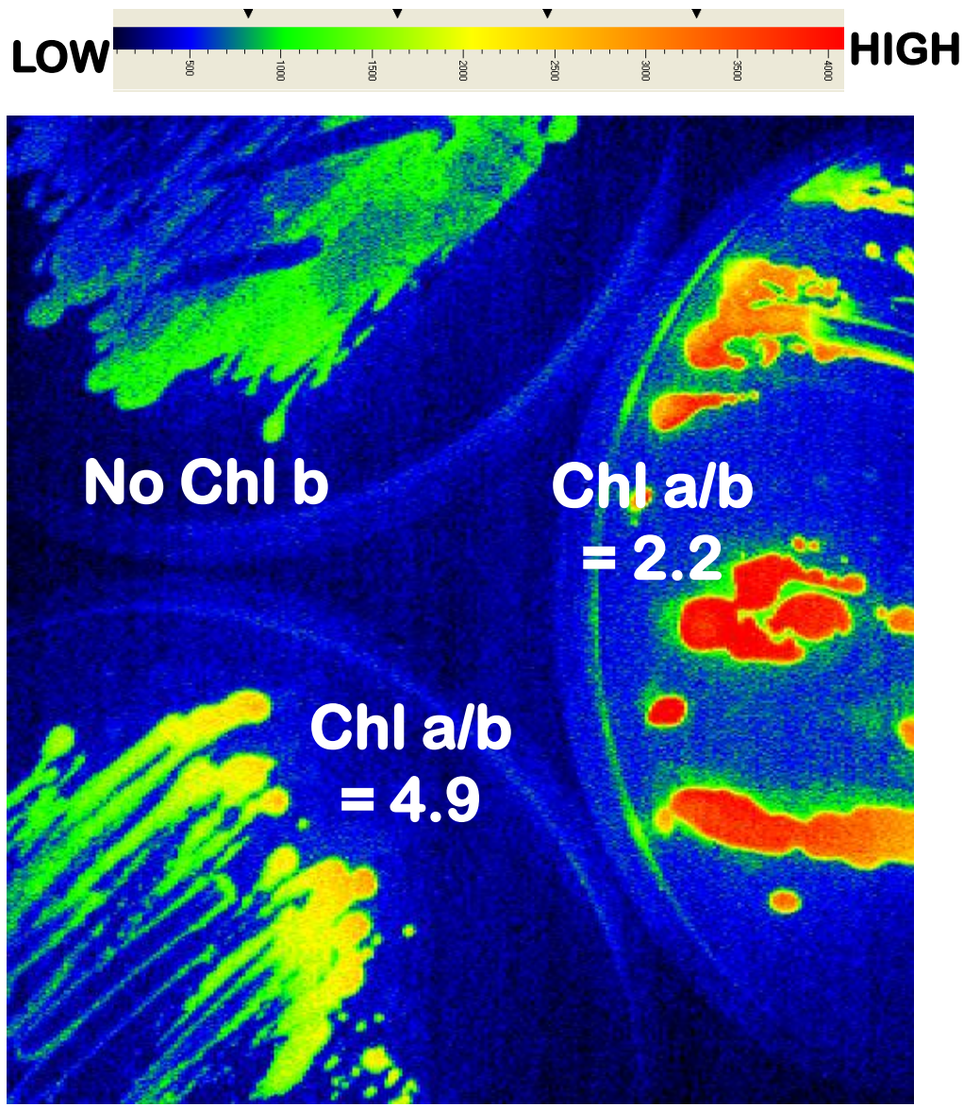


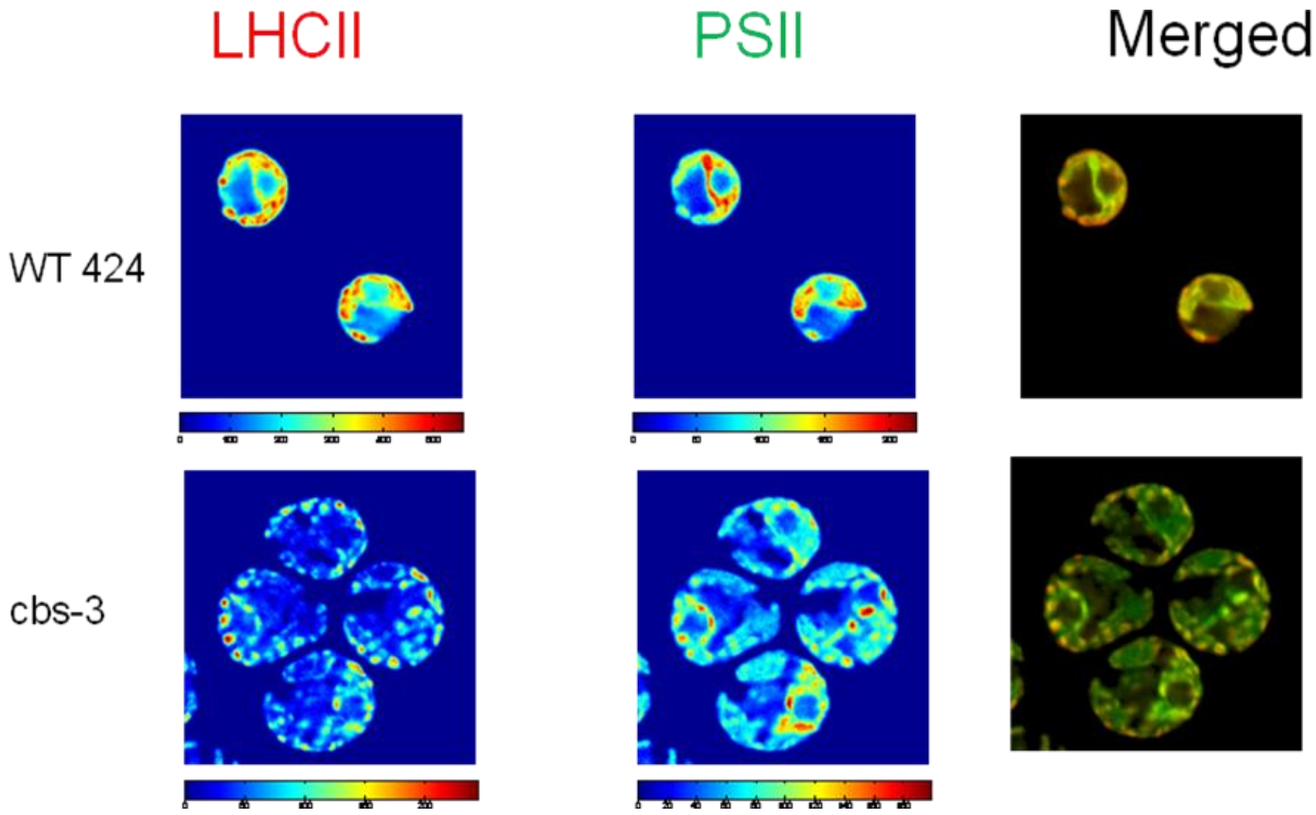
Transgenic algal strains with higher chlorophyll a/b ratios have smaller antennae sizes

Chl-protein complexes from algae with different antennae sizes



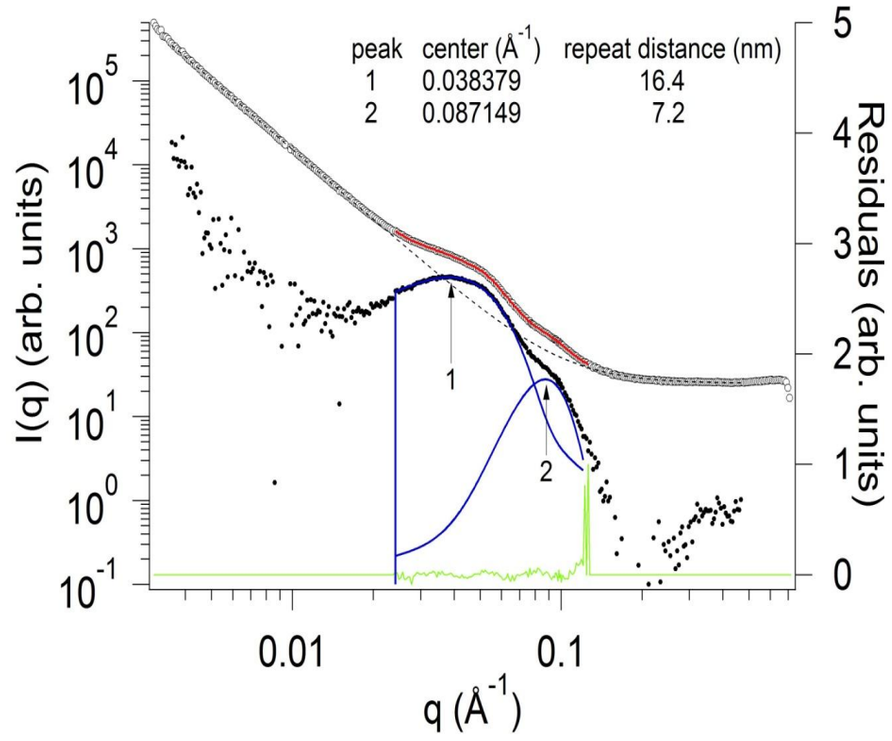
Raw Chl fluorescence is greater in strains containing more Chl b



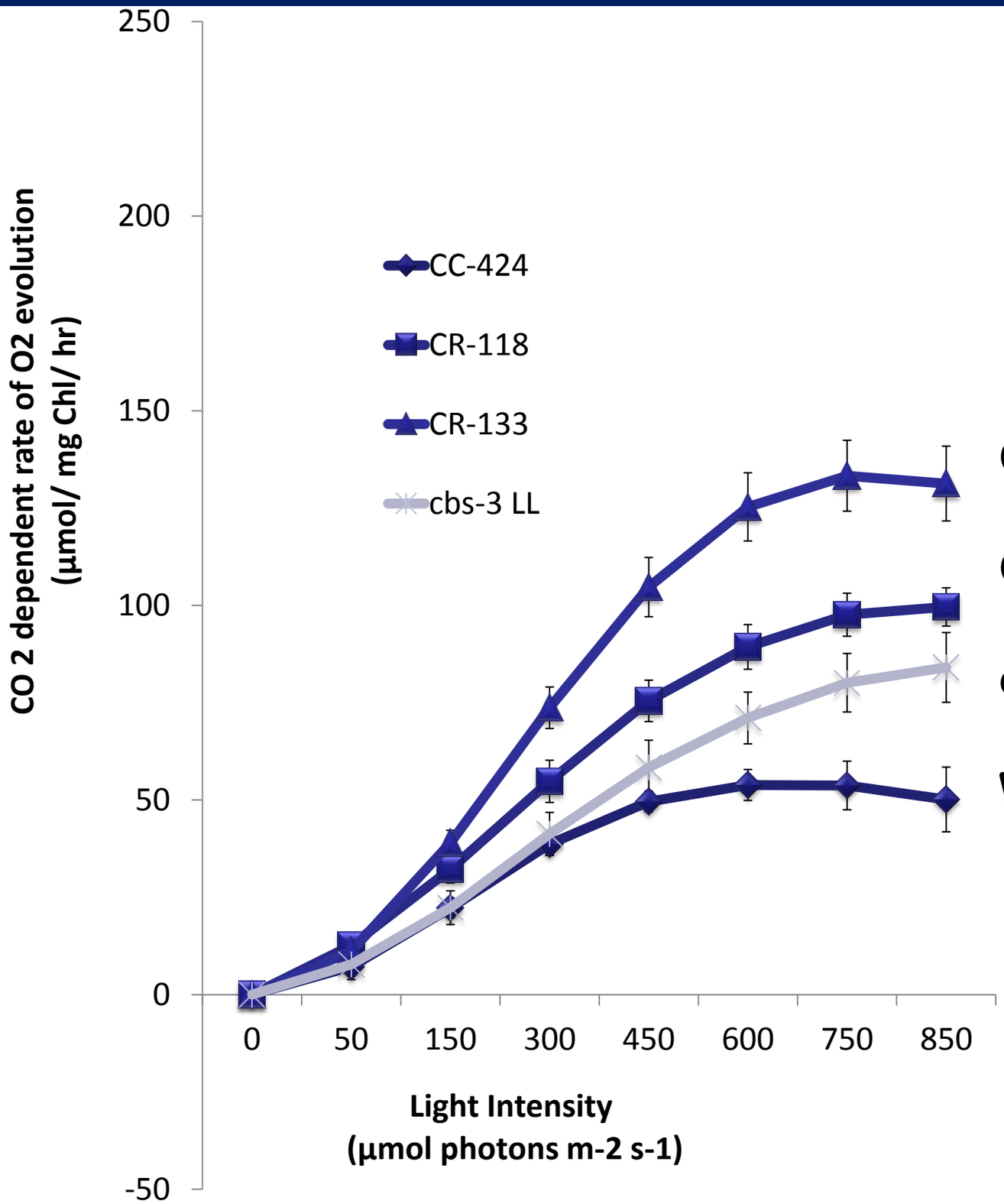


LHCII distribution is more disperse in transgenics having intermediate antennae sizes

High resolution hyperspectral imaging and SANS of LHC, PSII and membrane distribution



Transgenics with intermediate antennae sizes have the highest (2.5 X WT) photosynthetic rates at saturating light



CR-133; Chl a/b = 4.9

CR-118; Chl a/b = 4.0

Intermediate antennae

cbs3; No chl b ***Smallest antennae***

Wild type; Chl a/b = 2.2 ***Largest antennae***

Similar results were obtained when photosynthesis is expressed on a cell number rather than chlorophyll basis

Perrine et al., (2012) *Algal Research* "online"

Thank you

LANL
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