Mechanism of fucoxanthin biosynthesis in *Phaeodactylum tricornutum* under different light intensities via FCP complex formation

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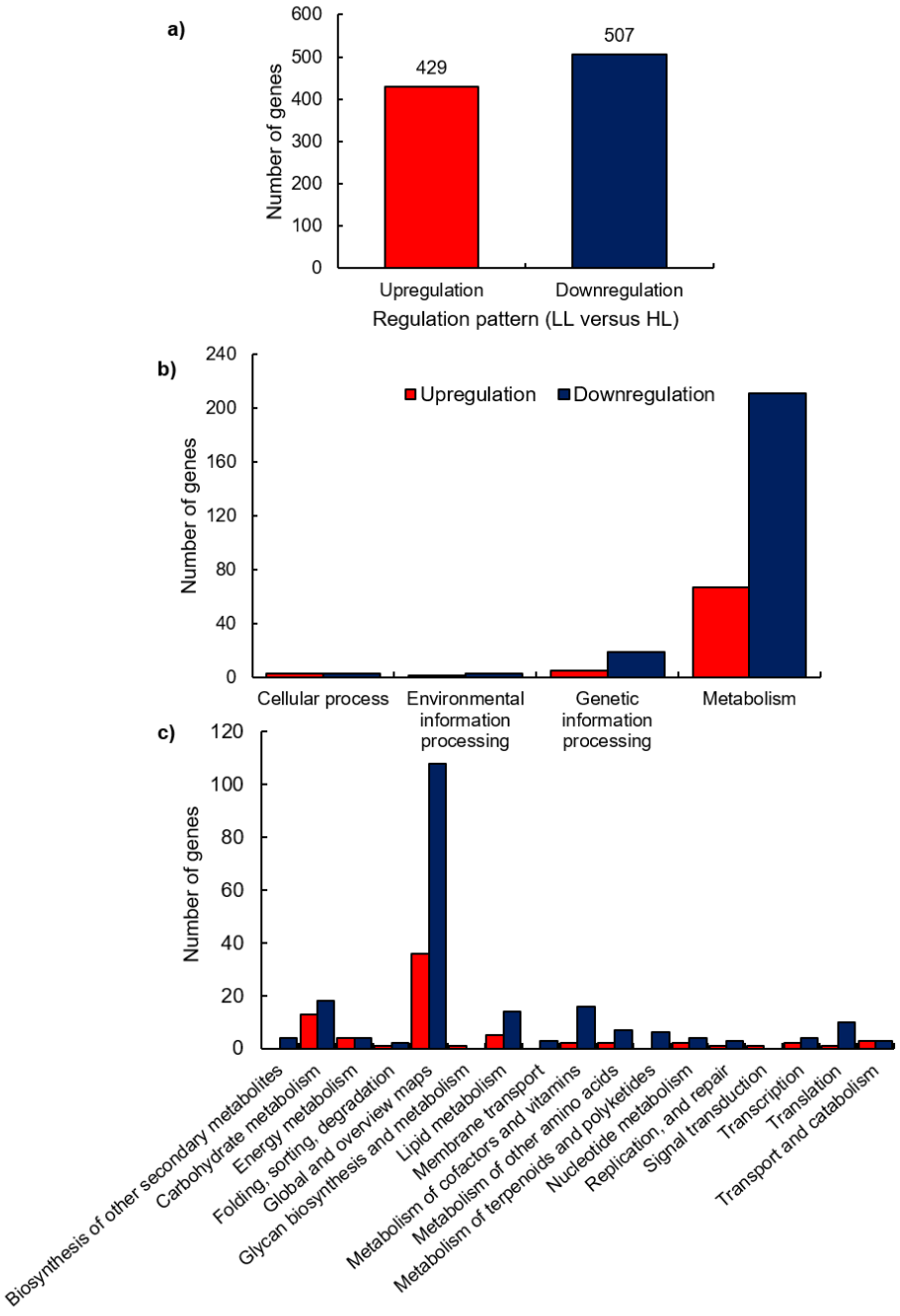
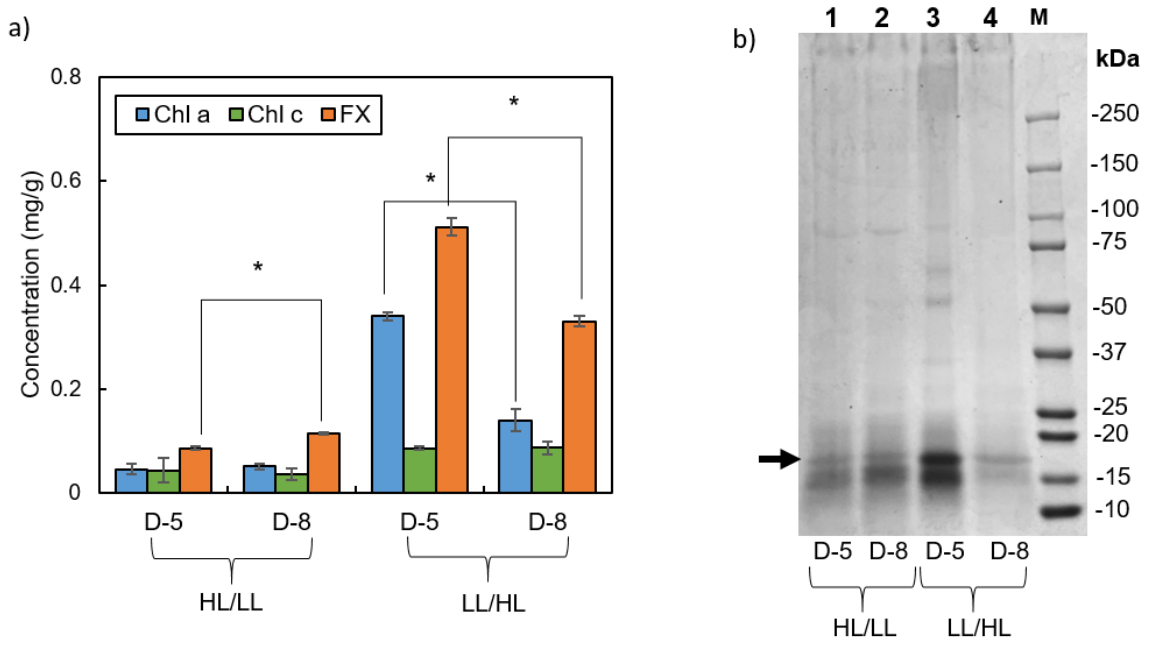


Supplementary Figure S1. Differentially expressed gene (DEG) analysis. (a) Total DEGs downregulated and upregulated in low light (LL)-grown *P. tricornutum* on day 5 of culture; (b) Classification and (c) Sub-classification of KEGG pathways related to identified DEGs. Results were normalized to data obtained from high light (HL)-grown *P. tricornutum* on day 5 of culture.



Supplementary Figure S2. Thylakoid membrane (TM) analysis. (a) Photosynthetic pigments in TM fractions isolated from day 5 (D-5) and day 8 (D-8) *P. tricornutum* cultures; (b) Detection of the FCP antennae enrichment (black arrow) in TM fractions using SDS-PAGE. Light transition was the switch from high-to-low light (HL/LL) and from low-to-high light (LL/HL). Asterisk denotes significant differences analyzed using unpaired t-test, two-tailed $p < 0.05$. Chl a, chlorophyll a; Chl c, Chlorophyll c; FX, fucoxanthin; M, marker; Lane 1, day 5 culture (before HL/LL transition); Lane 2, day 8 culture (after 3 days of HL/LL transition); Lane 3, day 5 culture (before LL/HL transition); Lane 4, day 8 culture (after 3 days of LL/HL transition)

Supplementary Table S1. Primers used for quantitative real-time polymerase chain reaction. H4, Histone H4; PSY, phytoene synthase; PDS, phytoene desaturase; VDL, violaxanthin de-epoxidase-like protein; LHCF, light harvesting chlorophyll a/c-fucoxanthin binding proteins; Fw, forward; Rv, reverse.

Annotation		Primer sequence (5′–3′)	Reference
PtH4	Fw Rv	AGGTCCTTCGCGACAATATC ACGGAATCACGAATGACGTT	Siaut *et al*, 2007
PtPDS1	Fw Rv	GTGGCAAACAATGCCCTACT AGTGATCGACGGCTTTGAGT	
PtPDS2	Fw Rv	GTCAGGAACACGTGACGGTA GCATCGAGAGTTGTTCGGGT	
PtPSY	Fw Rv	CCACGCCGAACATGCTTTAG GACTTCTTGCACTTGTGCCG	Yang and Wei, 2020
PtVDL1	Fw Rv	GTTCTTCTCCCAGAGCGGTA CGAATCCGTCGTACTTGACG	
PtLhcf3/4	Fw Rv	CGGTGACCAGGAGAAGTTCG ATCTCAGCGAAGGTCTTGCC	
PtLhcf5	Fw Rv	GACTTCCGGGAGACATCGAC CGATCTGGGCAATACCAGCA	
PtLhcf8	Fw Rv	AGGAAGTGGAAGGCAAGAGC GTGGACCATGAGTGCGAGAA	