Read me:

1. This file displays the phenotypes of **complemented lines for ARENA mutants and their immunoblotting results**. The catalog is on Slide 2.
2. A phenotype image of the original ARENA mutant is shown on each slide and labeled with mutant ID and gene information. See Table S1 for details.
3. Transformants derived from the mutant background with plasmids carrying wild-type genes were arrayed for phenotyping. Each array includes two colonies of wild-type GV32 (WT) and two of the original mutant as controls.
4. 'M' refers to the original mutant; 'Cx' to phenotypically-rescued lines; 'Nx' to transformants with mutant-like phenotypes.
5. For each gene, over 20% of transformants exhibited rescued phenotypes, explaining why many 'Cx' line neighbors also appeared wild-type.
6. Immunoblotting with an anti-FLAG antibody showed expected fusion protein bands in 'Cx' lines but not in 'Nx' lines for *PMR1*, *CPLD38*, and *CCS5*. Other cases had limited signal-to-background ratios, likely due to transgene expression challenges in *C. reinhardtii.* The high percentage of rescued phenotypes, beyond what random suppressor mutations would suggest, is the basis for our conclusion of successful genetic validation.
7. For each ARENA mutant, two or three lines have been cryopreserved for community sharing to facilitate further research.

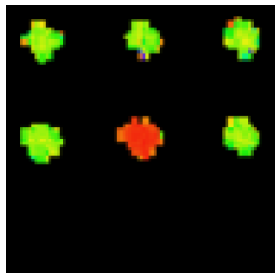
Catalog

Mutant ID	Mutant name	Which slide
arn0638	*pmr1*	Slide 3
arn0086	*rsga*	Slide 4
arn0415	*not11-1*	Slide 5
arn0586	*cpld38*	Slide 6
arn0095	*ccs5*	Slide 7
arn0525	*hvfn1*	Slide 8
arn0068	*tsp2*	Figure 4

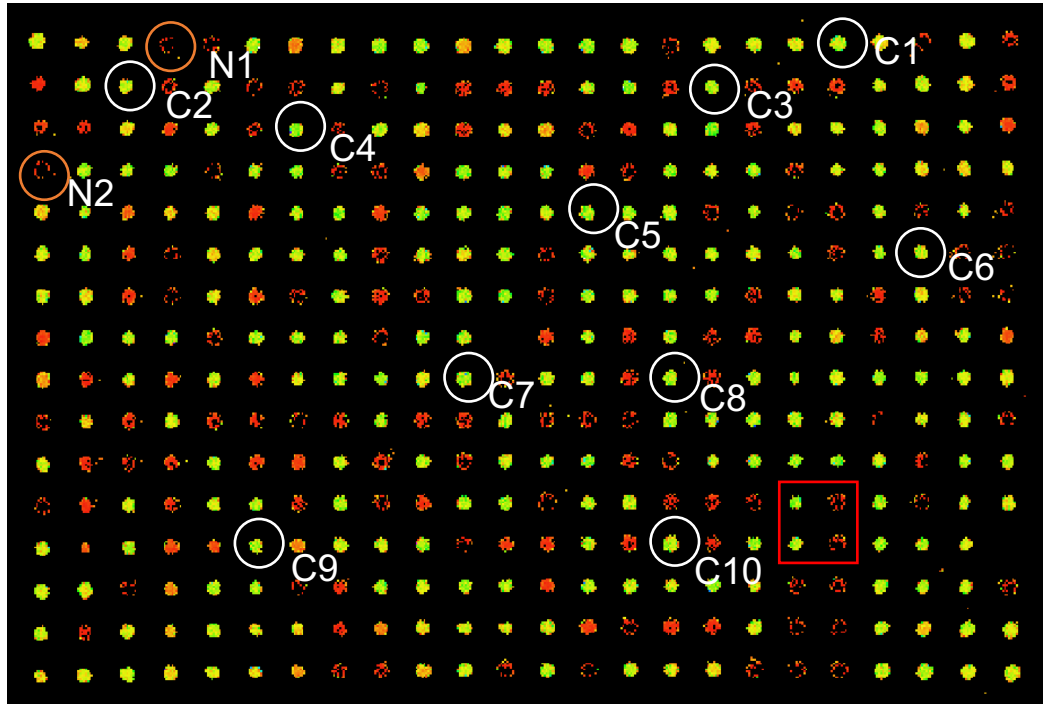
pmr1, D8_H2, arn0638

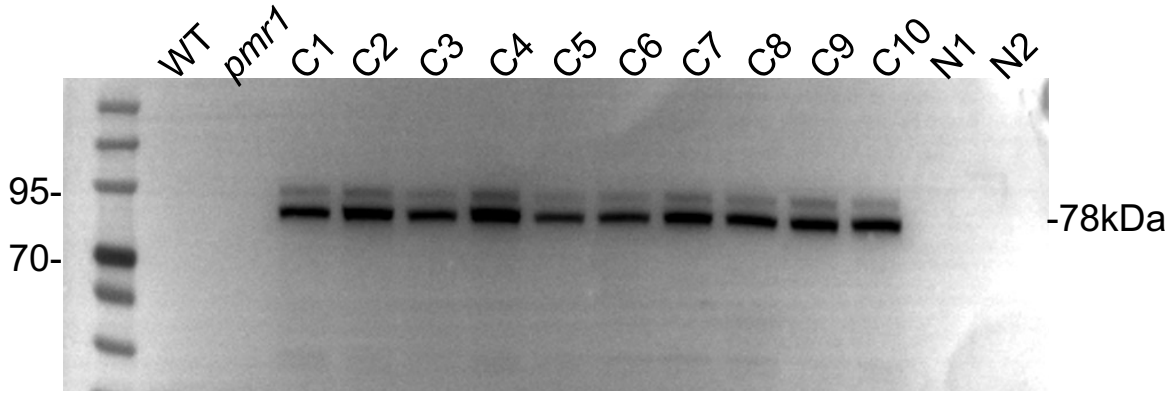
PMR1, Cre10.g448950

Nocturnin (CCRN4L)



−N_low NPQ





-PMR1-mCherry-Flag 78kDa

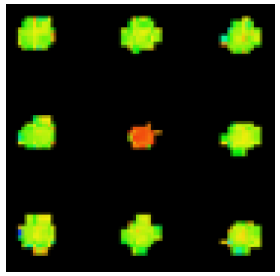
WT	m
WT	m

-PMR1-mCherry-Flag 78kDa

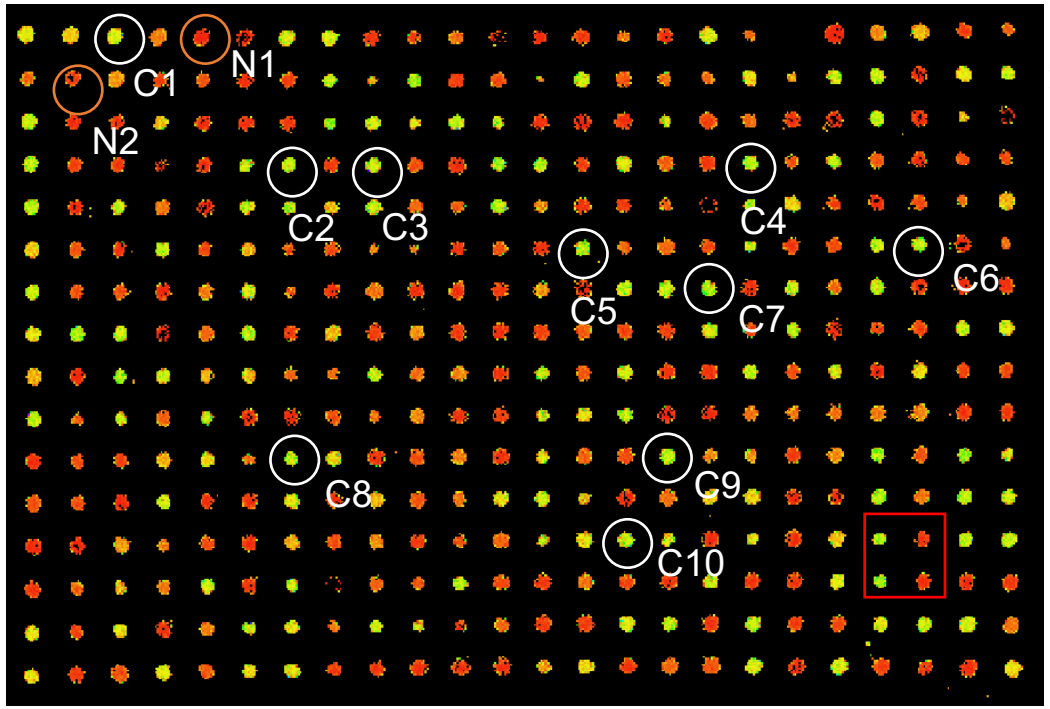
rsga, D2_B2, arn0086

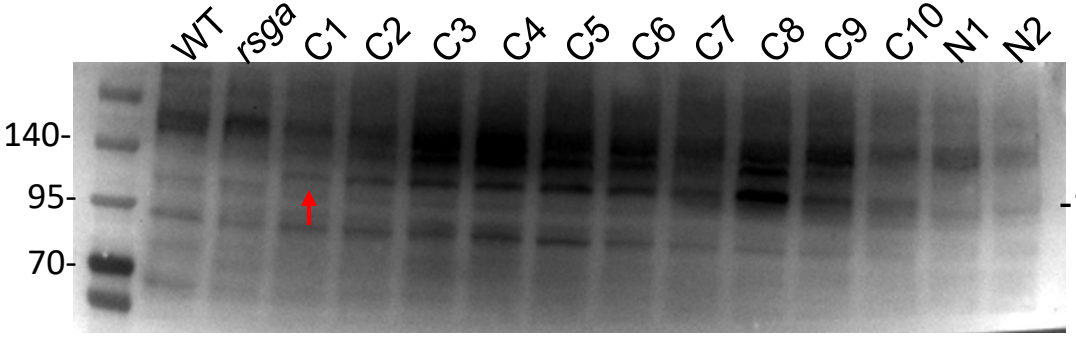
RSGA, Cre10.g436600

Ribosome biogenesis GTPase (rsgA, engC)



−N_low NPQ





WT m

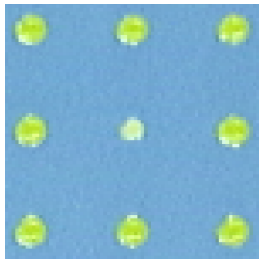
WT m

-RSGA-mCherry-Flag 100kDa

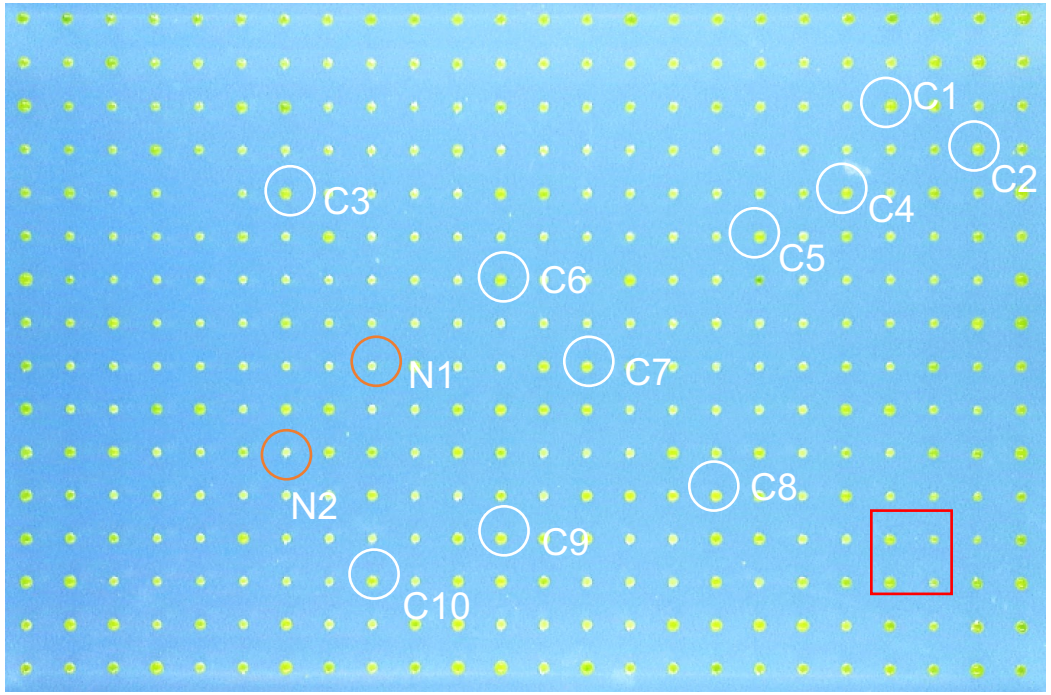
not11-1, D6_E7, arn0415

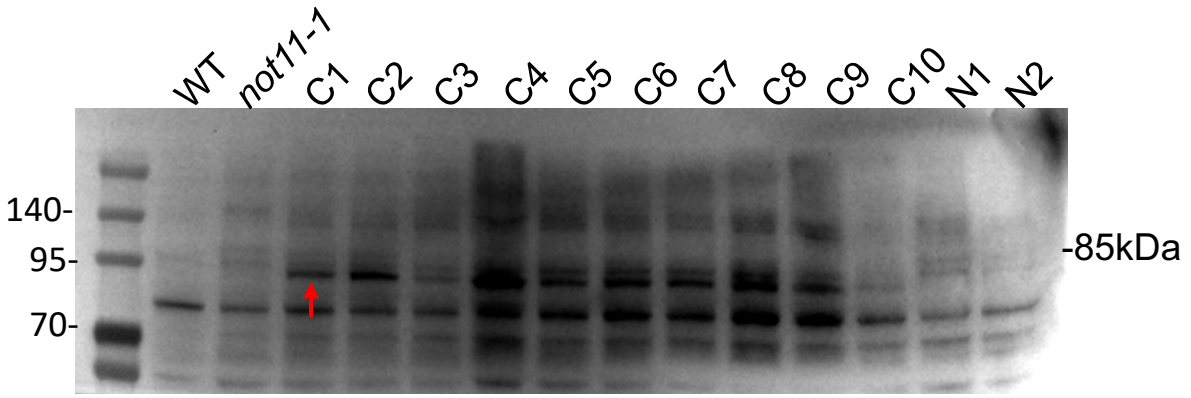
NOT11, Cre17.g726800

Uncharacterized conserved protein (DUF2363)



−N_fast chlorosis





WT m

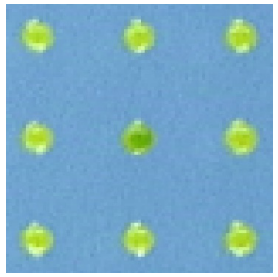
WT m

-NOT11-mCherry-Flag 85kDa

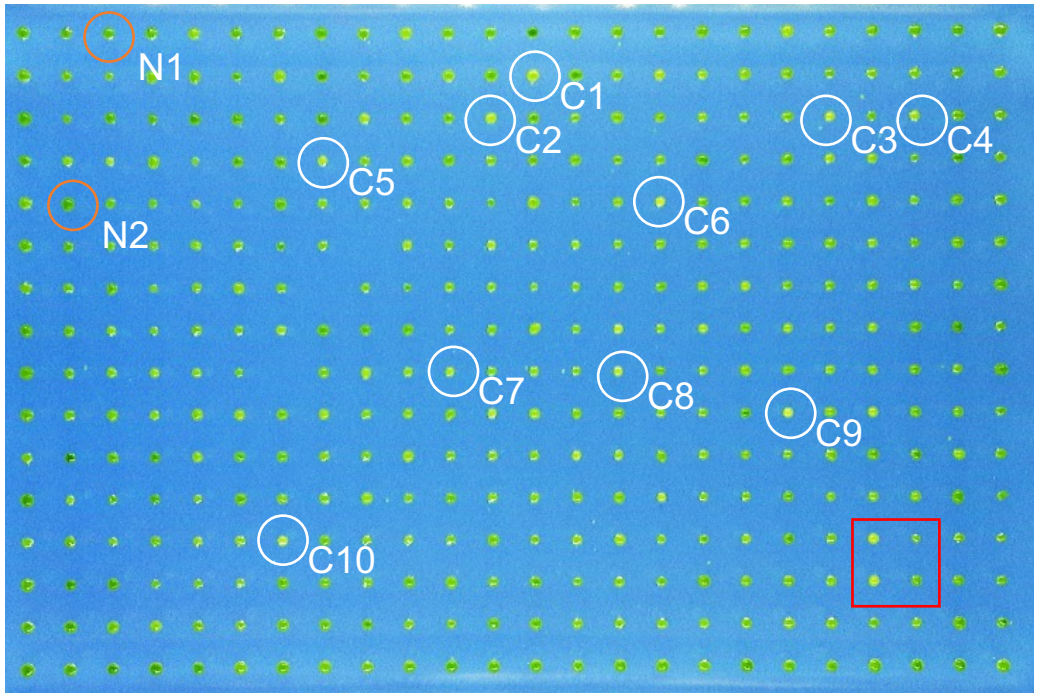
cpld38, D8_C10, arn0586

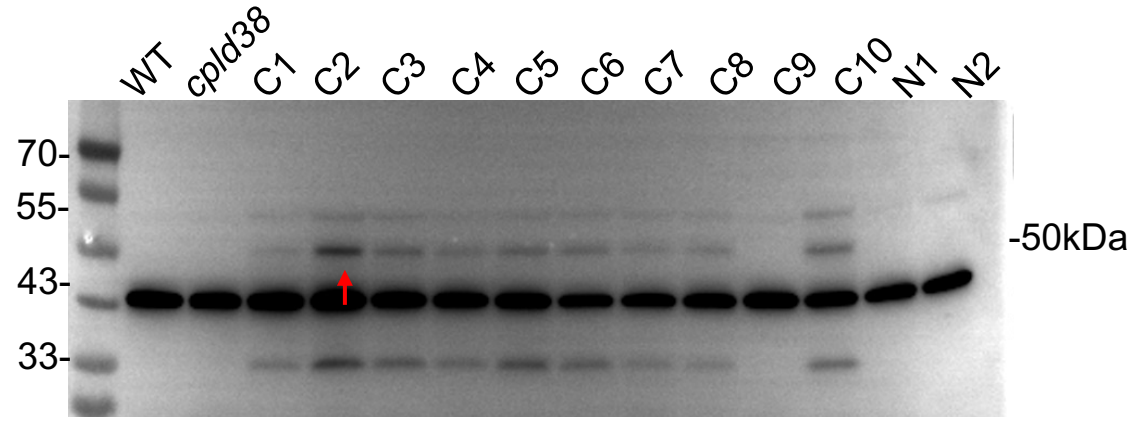
CPLD38, Cre01.g000850

Predicted protein, CPLD38



−N_fast chlorosis





WT m

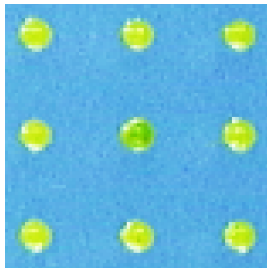
WT m

-CPLD38-mCherry-Flag 50kDa

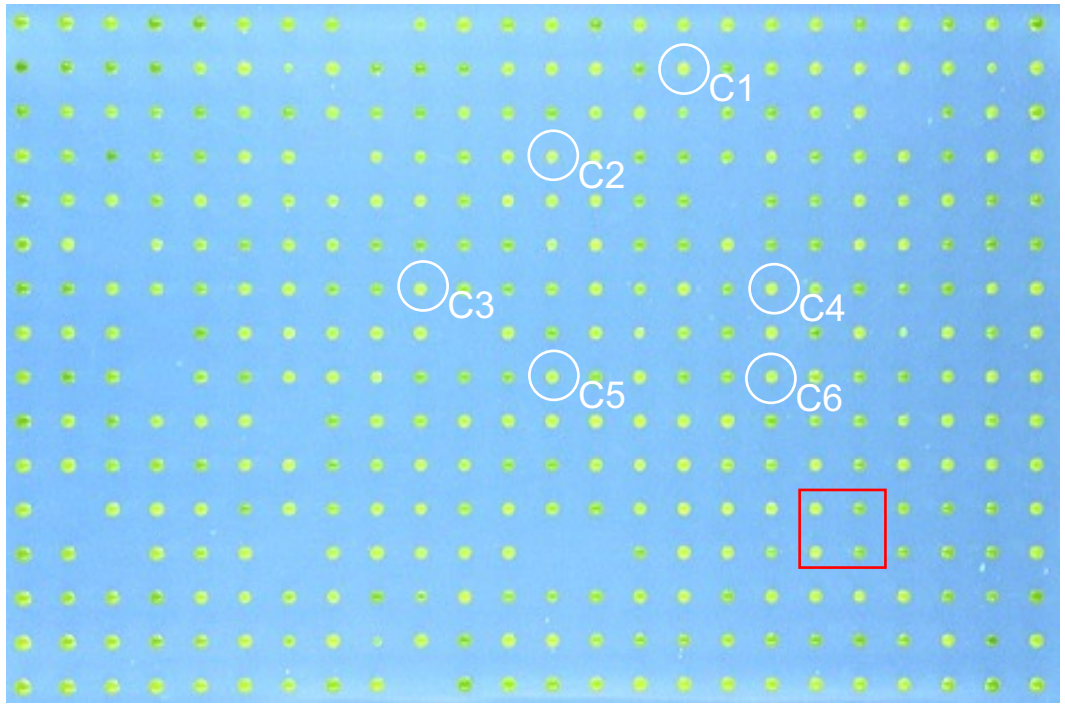
ccs5, D2_B11, arn0095

CCS5, Cre17.g702150

Thioredoxin-like protein hcf164, chloroplastic HCF164, TRX20, CCS5

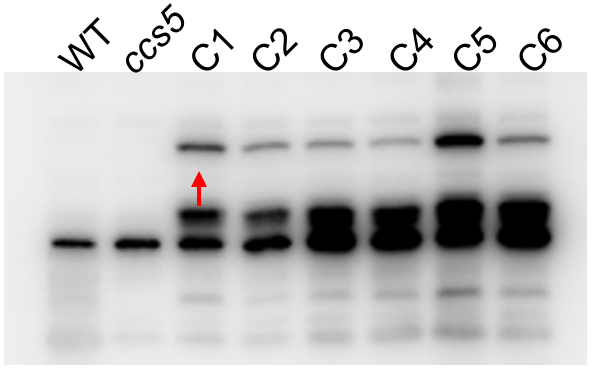


−N_fast chlorosis



WT m

WT m



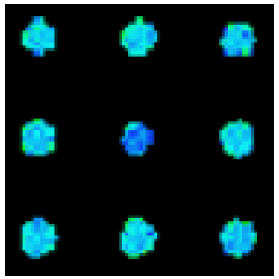
~57kDa

-CCS5-mCherry-Flag 57kDa

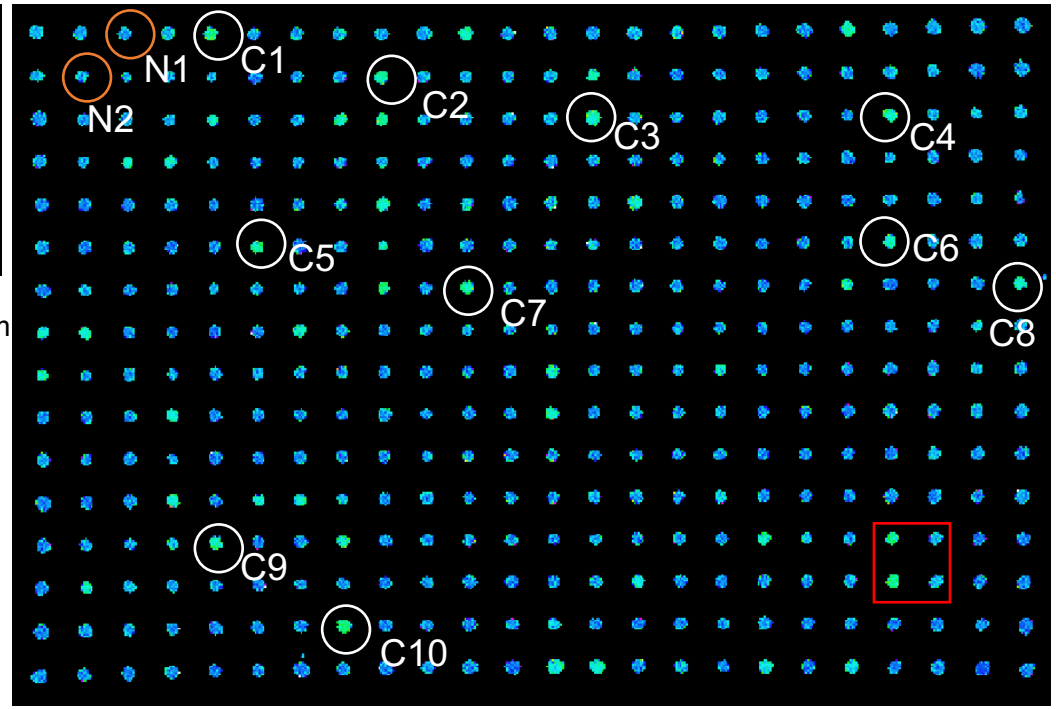
hvfn1, D7_F9, arn0525

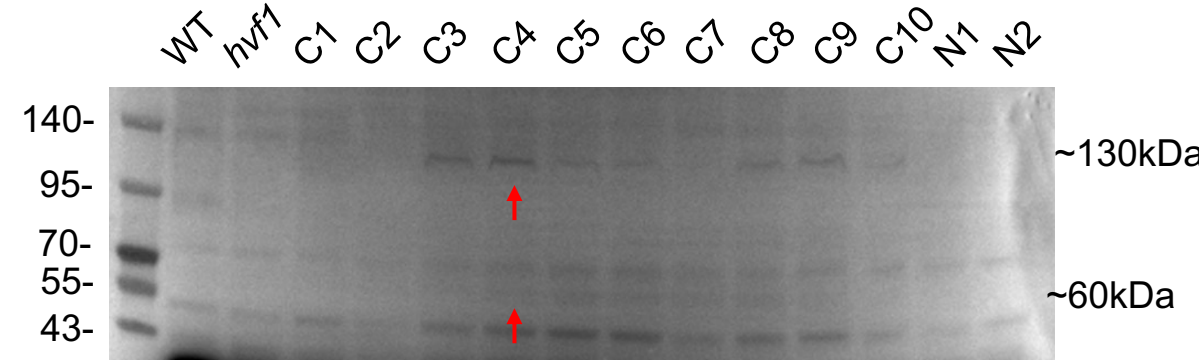
HVFN1, Cre10.g424550

Coexpressed with genes in phototrophic condition specific coexpression subnetwork



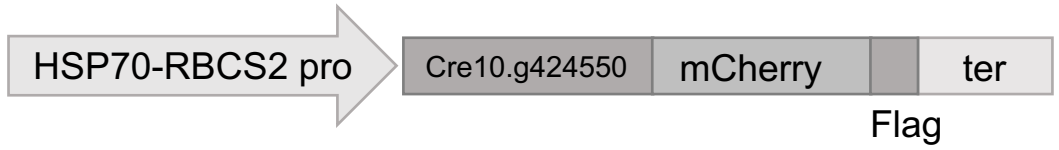
−N_high F_v/F_m





WT m

WT m



-Cre10.g424550-mCherry-Flag 74kDa