

Supplementary Materials:

Table S1. Composition of ω -3 and ω -6 diets.

Product #	D14040901		D14040902s	
	Omega-3 Diet		Omega-6 Diet	
	gm%	kcal%	gm%	kcal%
Protein	20	20	20	20
Carbohydrate	61	59	61	59
Fat	10	22	10	22
Total		100		100
kcal/gm	4.1		4.1	
Ingredient	gm	kcal	gm	kcal
Casein	200	800	200	800
L-Cystine	3	12	3	12
Corn Starch	367	1468	367	1468
Maltodextrin 10	132	528	132	528
Sucrose	100	400	100	400
Cellulose, BW200	50	0	50	0
Soybean Oil	0	0	0	0
ARASCO (42% ARA)	0	0	4.8	43
DHASCO (43% DHA)	1.042	9	0	0
MEG-3 (45% EPA, 24% DHA)	2.3	21	0	0
Safflower Oil, High Oleic	96.658	870	95.2	857
t-Butylhydroquinone	0.014	0	0.014	0
Ascorbyl Palmitate	0.5	0	0.5	0
Mineral Mix S10022G	35	0	35	0
Vitamin Mix V10037	10	40	10	40
Choline Bitartrate	2.5	0	2.5	0
Total	1000	4148	1000	4148

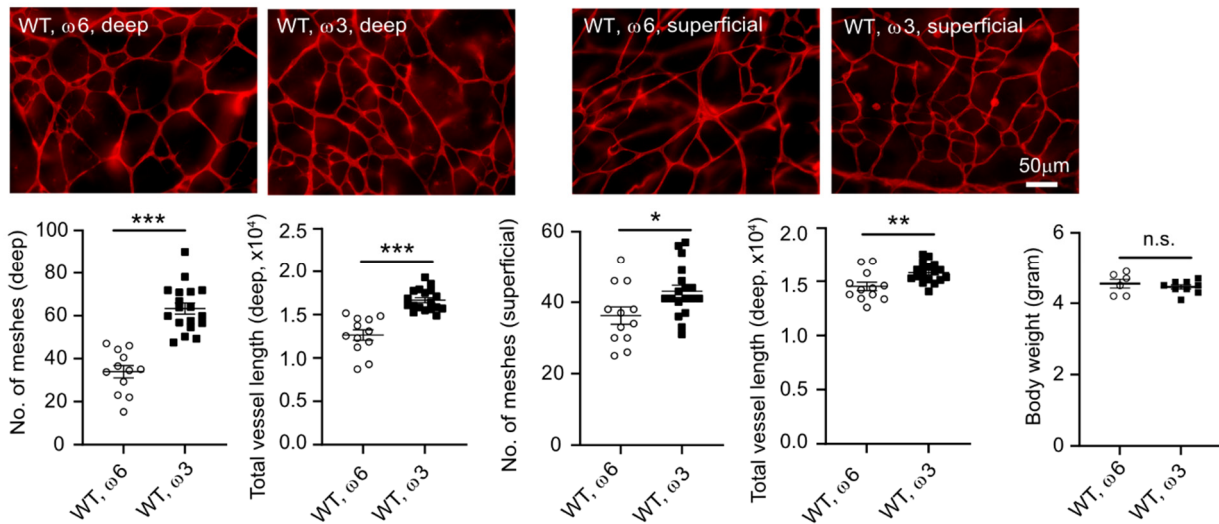


Figure S1. Dietary ω -3- vs. ω -6-LCPUFA supplementation from birth increased retinal vascular density under normoglycemia. Representative images of retinal vessels in P10 C57BL/6J STZ mice fed on ω -3- or ω -6-LCPUFA-enriched diet from birth. Retinal vessels were stained with isolectin. Scale bar, 50 μ m. ω -3- versus ω -6-LCPUFA-enriched diet increased retinal vascular density at P10. $n=12-18$ eyes. Unpaired t test. *** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$, n.s., no significance. Data was represented as Mean \pm SEM.

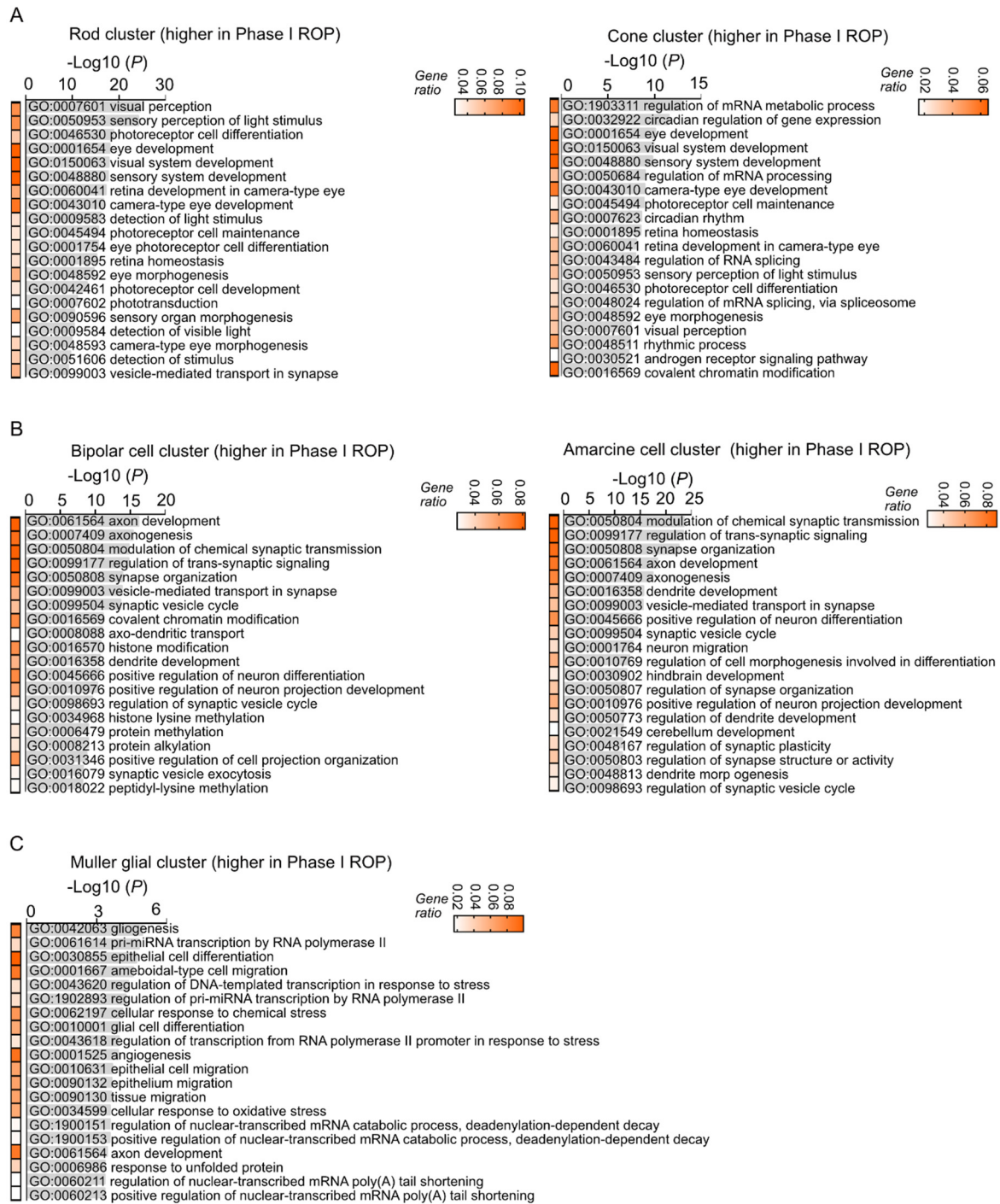


Figure S2. The higher expression of genes in the (A) rod and cone, (B) bipolar and amacrine cell cluster of Phase I ROP versus normal control mice were associated with visual perception, eye development, axon development, synapse organization related gene-ontology terms. The higher expression of genes in the Müller glial cell cluster (C) of Phase I ROP vs normal control mice were associated with gliogenesis, angiogenesis and axon development related gene-ontology terms. Adjusted *P*-values for enriched gene-ontology (GO) terms are shown in bar graphs (*P*<0.05). Gene ratio for each pathway is shown in heatmap.

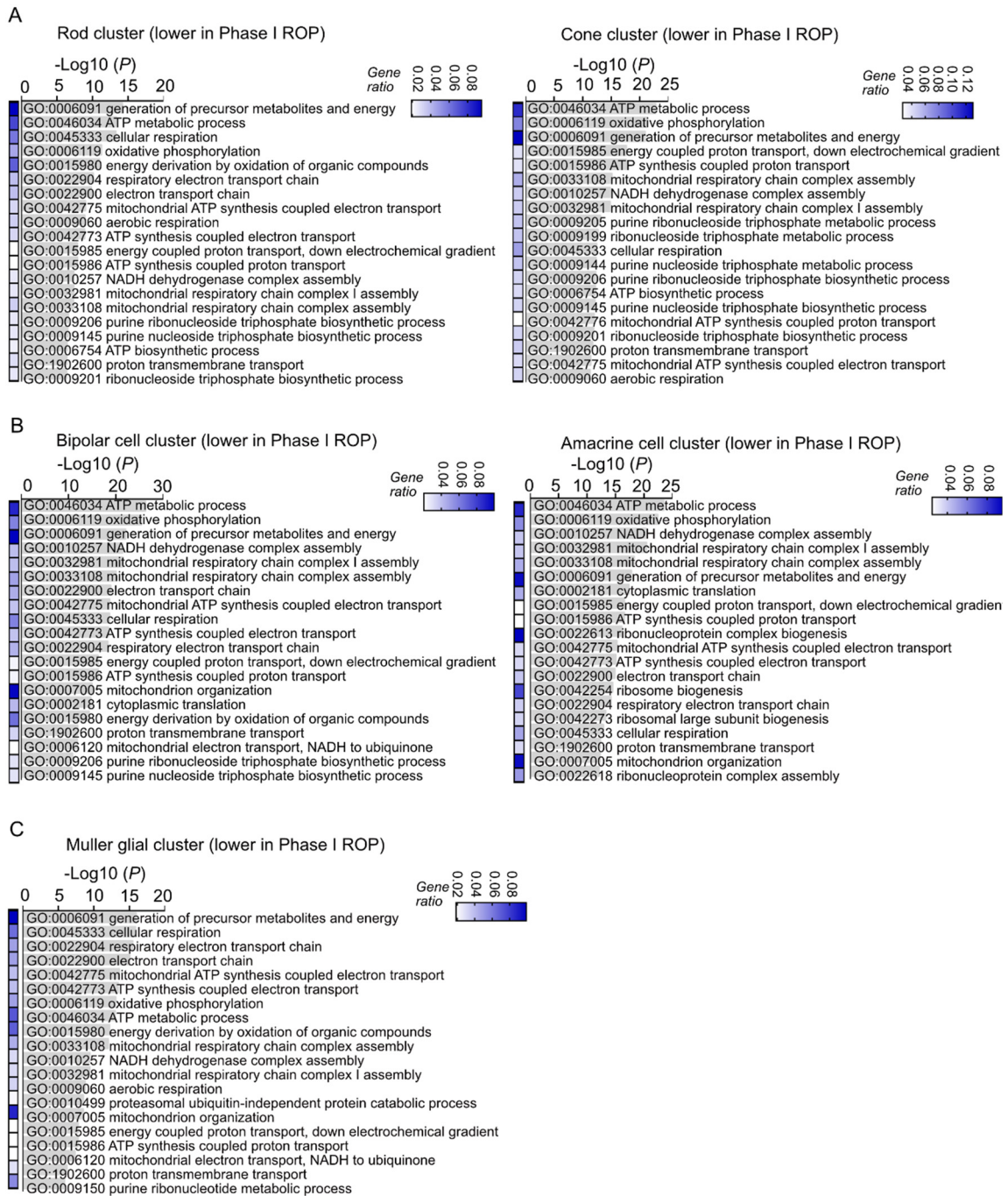


Figure S3. The lower expression of genes (top 20) in the (A) rod and cone cluster, (B) bipolar and amacrine cell, (C) Müller glial cell cluster of Phase I ROP versus normal control retinas were associated with energy production related gene-ontology terms. Adjusted *P*-values for enriched gene-ontology (GO) terms are showed in bar graphs (*P*<0.05). Gene ratio for each pathway is shown in heatmap.