

## Supplemental data

*Supplementary Table S1 – Differences of mitochondrial protein expression in male flies that were exercised for one week (N=3). Statistically significant differences in protein expression (one-way ANOVA) were determined using SameSpots (TotalLab). Protein identification was conducted using 2D-PAGE followed by MALDI-TOF/MS.*

Spot no.	Protein identity	Anova (p)	Fold Change	Exercise related change
519	Arginine kinase OS=Drosophila melanogaster	0.003	2	Reduced
784	NADH-ubiquinone oxidoreductase 75 kDa subunit	0.004	1.5	Increased
773	Alcohol dehydrogenase	0.012	1.7	Reduced
791	Actin, larval muscle	0.024	2.7	Reduced
788	IP09655p (malate dehydrogenase)	0.037	1.8	Reduced
	Succinate-CoA ligase [ADP/GDP-forming] subunit alpha			
	ATP synthase subunit alpha			

*Supplementary Table S2 - Difference in whole fly protein expression in response to one week of exercise (N=3). Statistically significant differences in protein expression (one-way ANOVA) were analysed using SameSpots, TotalLab. Protein identification by MALDI-TOF/MS. F/M/g/se, female/male group/single exercised; F/M/g/sne, female/male group/single non-exercised.*

Group	Spot no.	Protein Identity	Anova (p)	Fold change	Increased in
Fge vs Fse	349	Glycerol-3-phosphate dehydrogenase [NAD(+)], plus a single peptide match to Probable isocitrate dehydrogenase [NAD]	0.008	1.5	Fse
	358	Aconitate hydratase	0.016	1.2	Fge
Fge vs Fgne	351	Glycerol-3-phosphate dehydrogenase [NAD(+) ]	0.032	1.7	Fgne
	363	Aconitate hydratase	0.047	1.5	Fge
	375	Vitellogenin-3	0.039	1.6	Fge
Mgne vs Fgne	472	Pyruvate dehydrogenase E1 component subunit beta	0.001	2.2	Mgne
	486	Fructose-bisphosphate aldolase	0.0009479	2.4	Fgne
Mge vs Mgne	487	Dihydrolipoyl dehydrogenase	0.0005776	1.7	Mgne

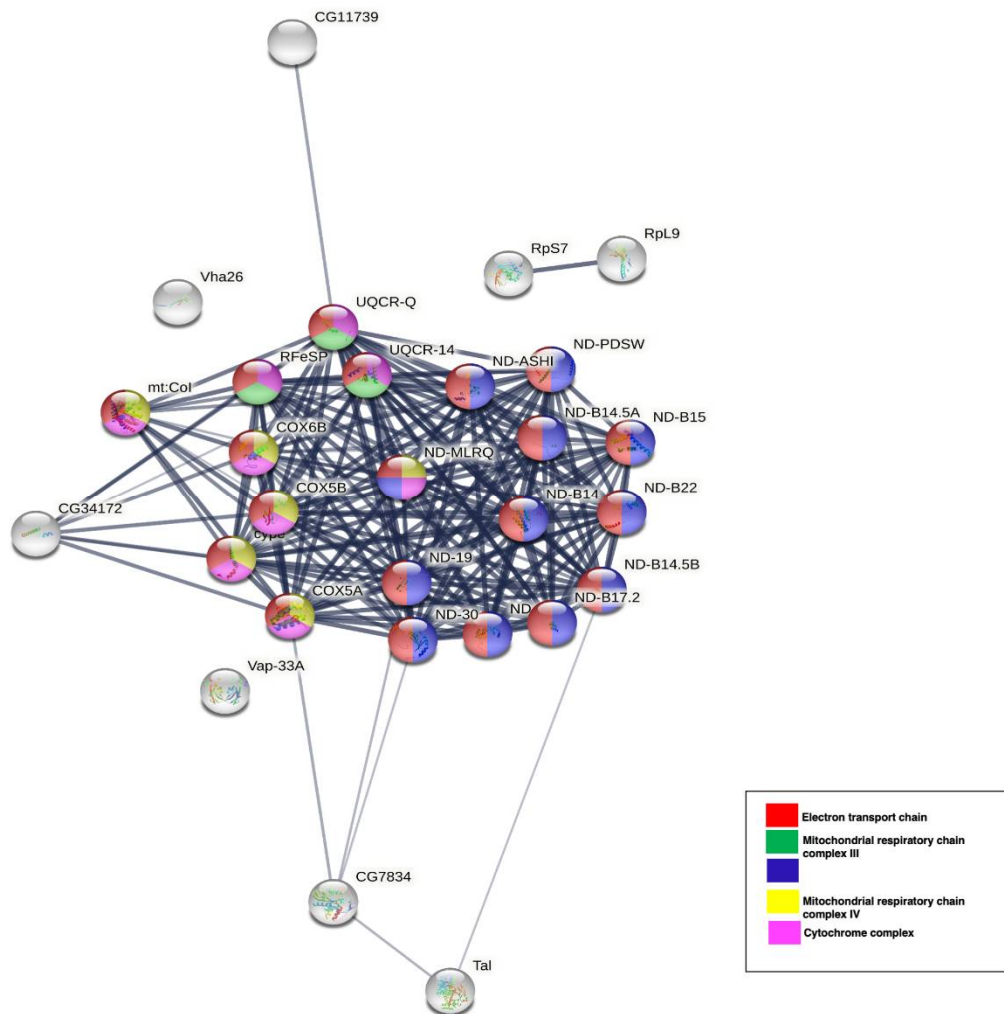


Figure S1

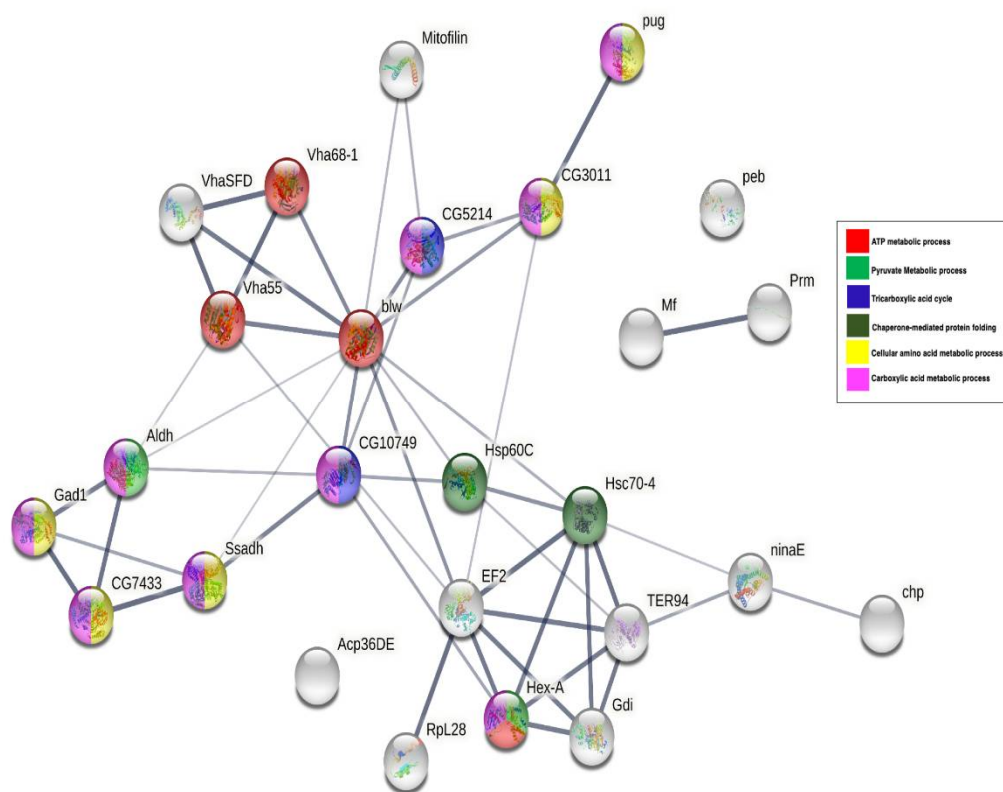
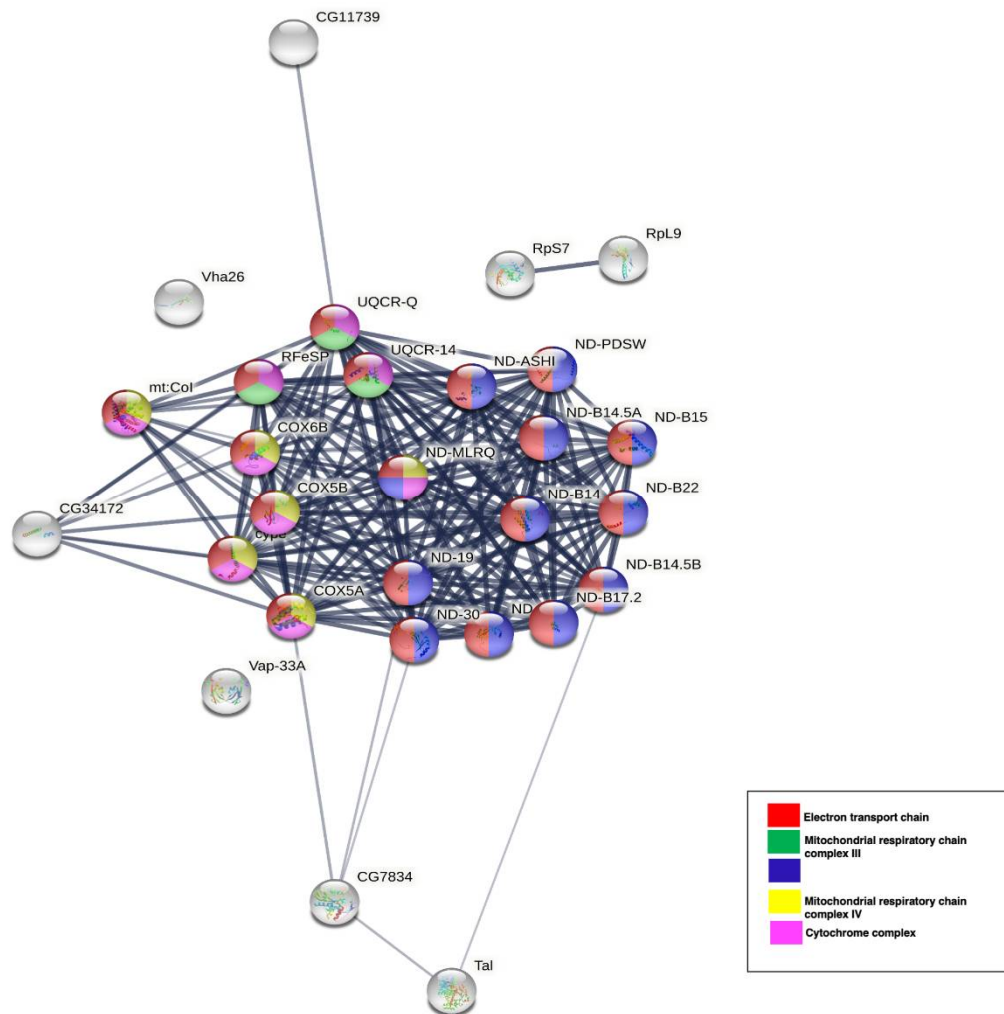
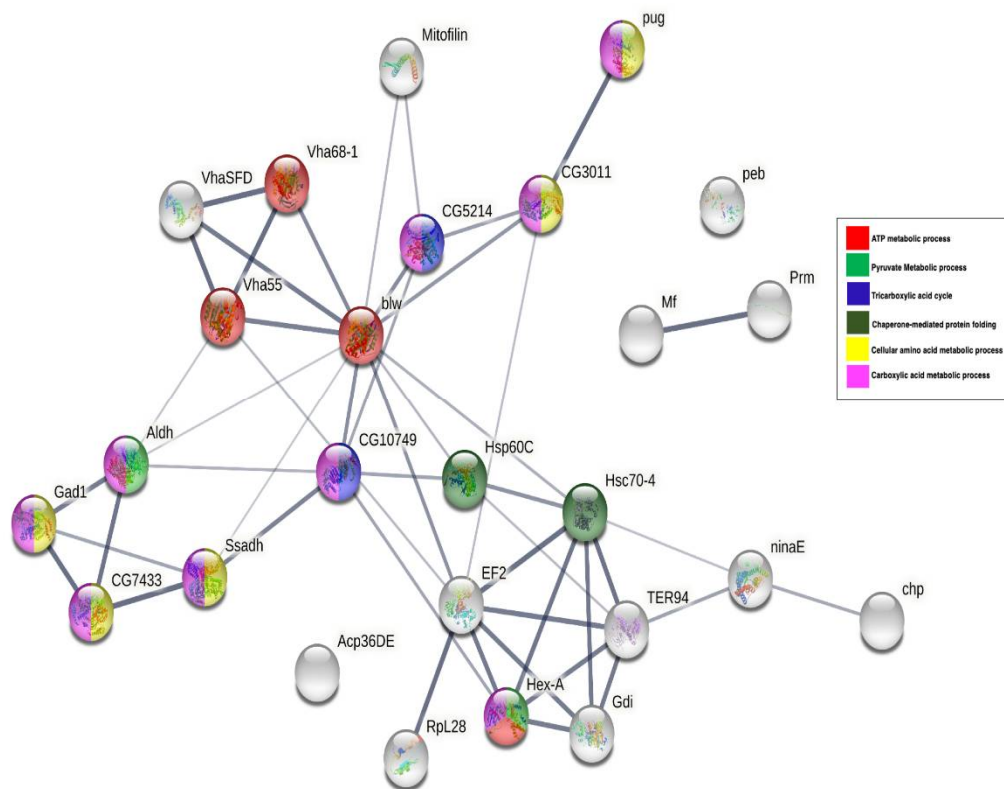


Figure S2



Supplementary Figure S1 - PPI network of mitochondrial proteins with increased abundance ( $RAR > 1.5$ ) in response to one week of exercise in *D. melanogaster*. Network analysis by the STRING v11.0. software, with functional enrichment of ( $P < 1.0e-16$ ).



Supplementary Figure S2 – Protein-protein interaction network of mitochondrial proteins that have decreased abundance in response to one week of exercise in *D. melanogaster*. Network analysis by the STRING v.11.0. software, with functional enrichment of  $P < 2.75e-08$ .