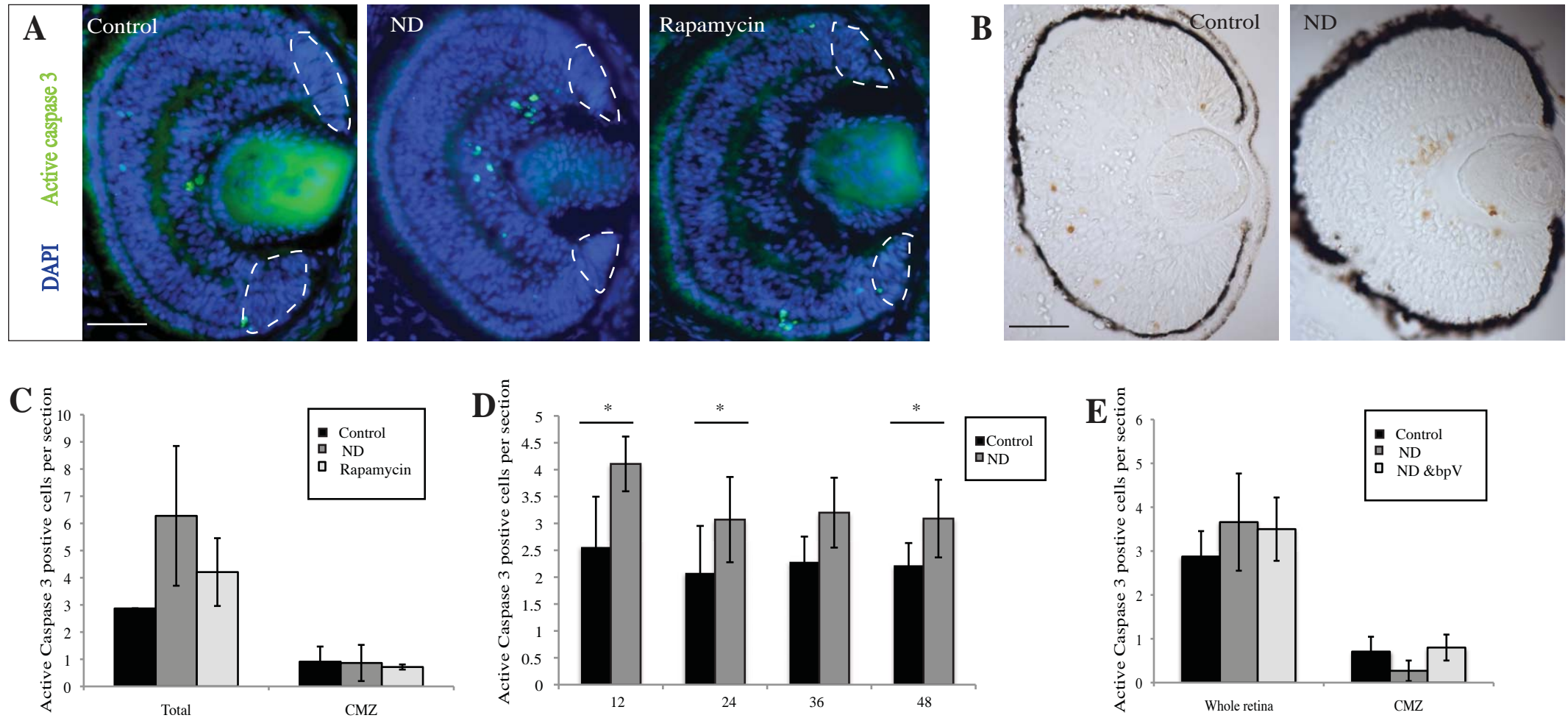


Sup.Fig.1 The CMZ as a model to study nutrient deprivation

(A) DAPI labelled sagittal section through a stage 41 retina, showing the location of the Ciliary Marginal Zone (CMZ). (B) DAPI stained transverse section of the CMZ showing the spatial recapitulation of the temporal progression of neurogenesis. (C) Schematic representation of gene expression patterning in the CMZ of the stage 41 embryo. Scale bars: A = 100 μ m, B= 25 μ m

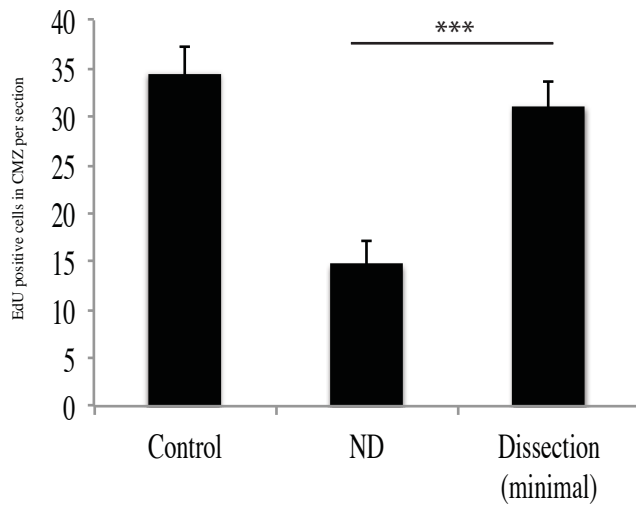
Supp. Figure 2



Supp. Fig. 2 Decreased proliferation is not the result of increased cell death

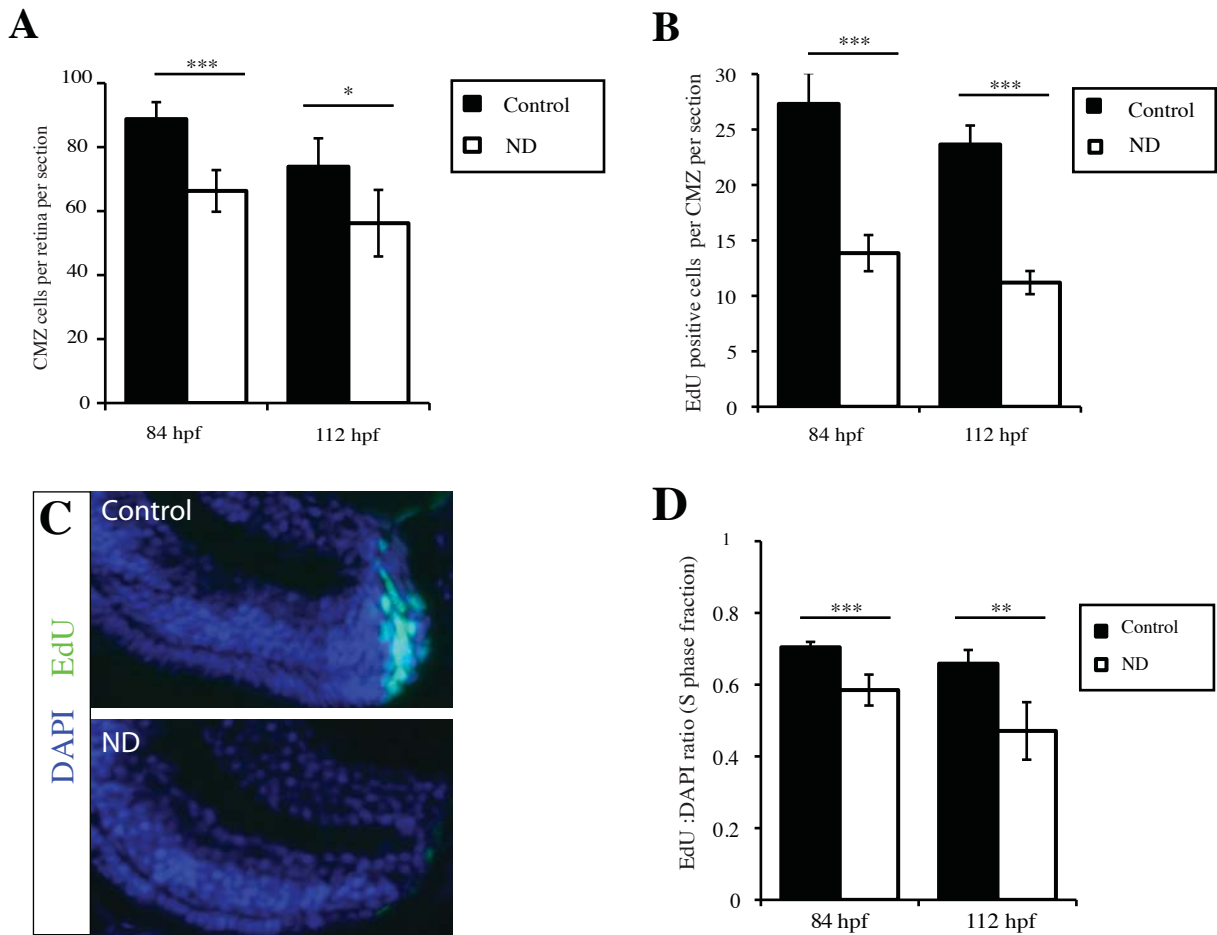
ND and Rapamycin treatment for two days does not result in increased CMZ cell death indicated by active caspase 3 staining (A) or TUNEL (B), however the number of apoptotic cells was increased in the differentiated retina (C). (D) Apoptosis was initially slightly higher in the retina at 12, 24 and 48 hours after ND when compared to controls. (E) bpV treatment did not affect the number of active caspase 3 positive cells. All error bars show 95% C.I. * $p < 0.05$. (n=3, 12 retinas/condition). Scale bars = 100 μ m

Supp. Figure 3



Sup.Fig.3 Decreased proliferation after ND is not due to injury: Minimal dissection with less than 25% of the yolk removed does not impair proliferation, n= 8-13 embryos, 2 hour EdU pulse, dissection from St. 35 to St. 42., ***p< 0.001.

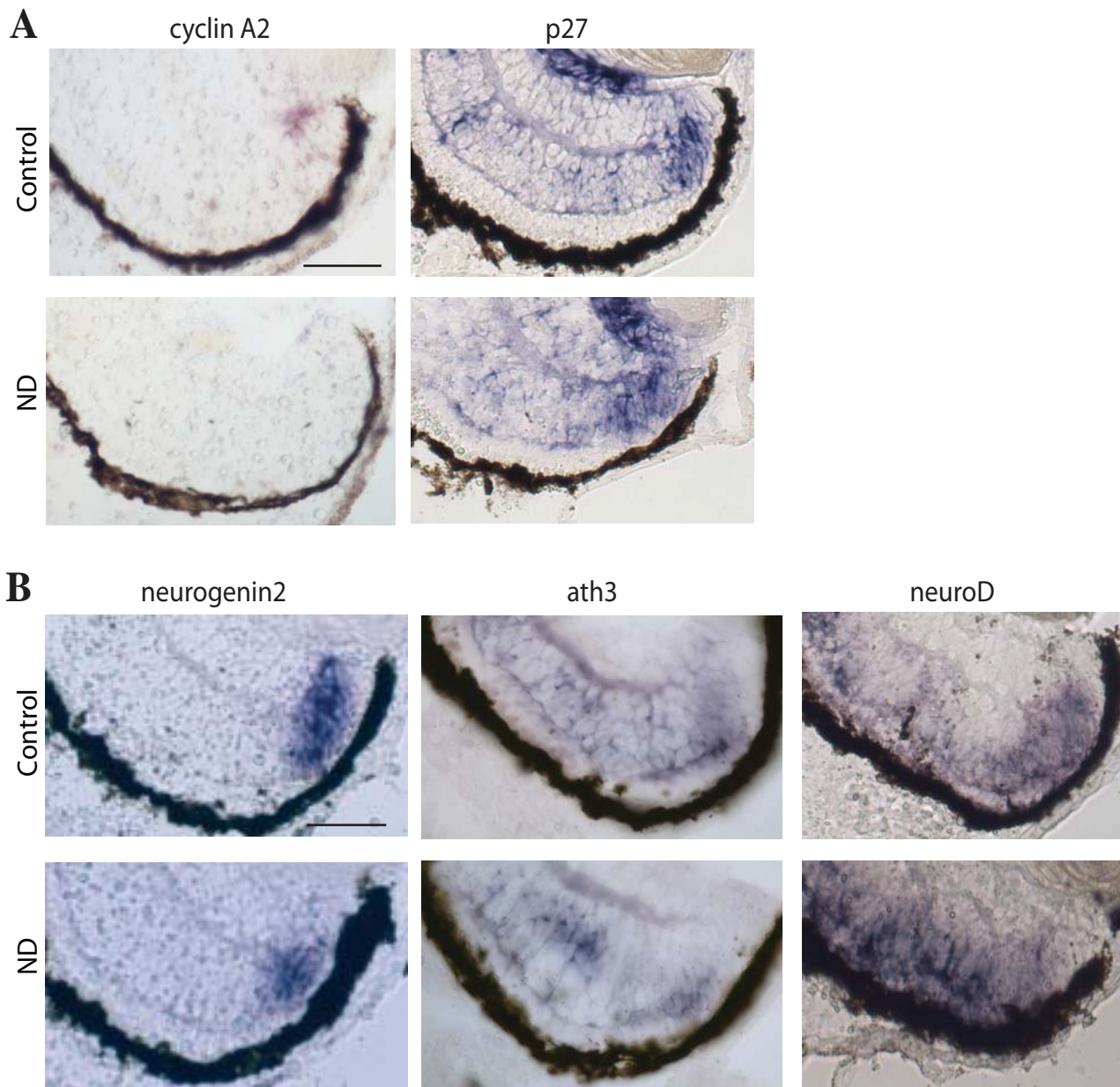
Supp. Figure 4



Sup.Fig.4 ND also results in decreased proliferation in the Zebrafish retinal CMZ

CMZ proliferation was significantly decreased in 84hpf and 112hpf nutrient deprived zebrafish at 56hpf. Nutrient deprived fish had fewer CMZ cells (A) and decreased EdU incorporation (B-C). (D) The proportion of CMZ cells that were EdU positive in S phase decreased suggesting cell cycle slowdown. Error bars show 95% C.I. Unpaired t test, n=9-29 retinas ***p<0.001, **p<0.01, *p<0.05

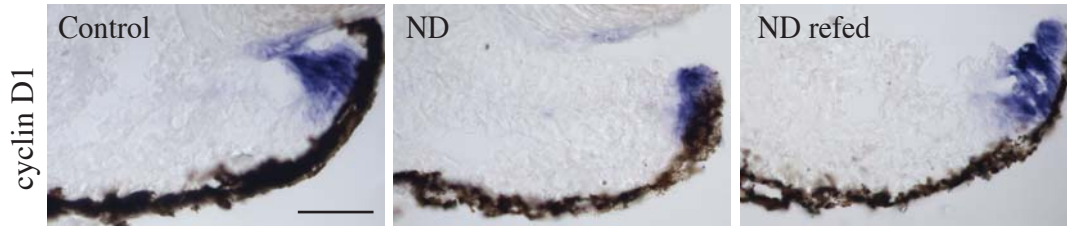
Supp. Figure 5



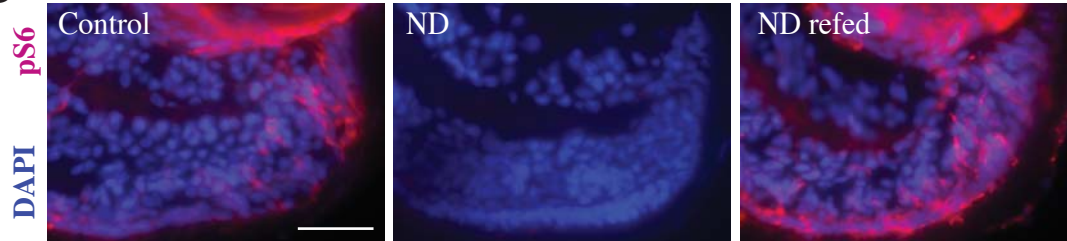
Sup.Fig.5 Nutrients are needed for neural commitment and differentiation

(A) Expression of cyclin A2, and of the proneural genes (B) neurogenin 2, ath3 and neuroD was decreased in the CMZ (n=8, 32 embryos/condition). Scale bars =50 μ m

A



B

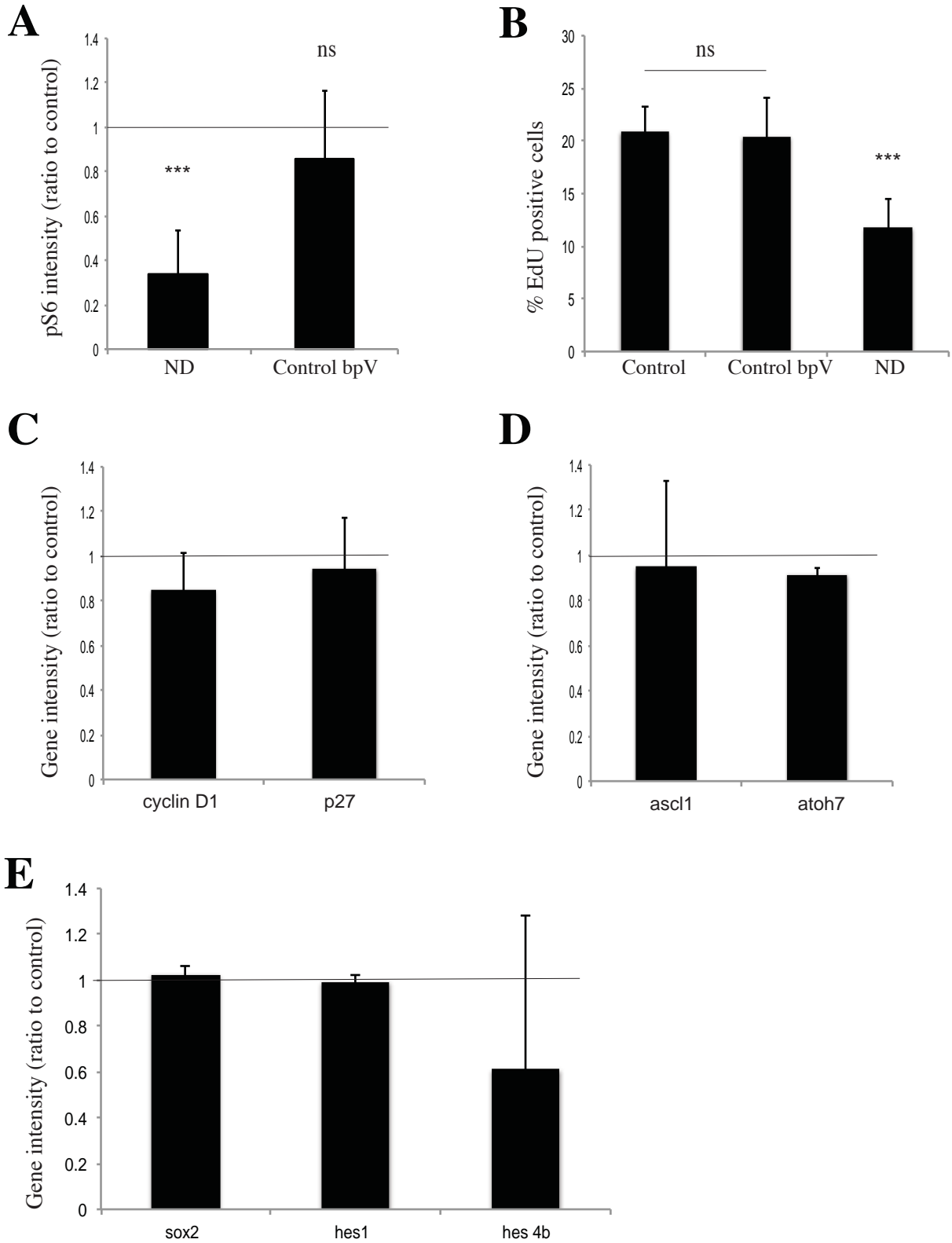


Sup.Fig.6 Re-feeding rescues pS6 expression

(A) After culture for 24 hours in 60% L15 a statistically significant upregulation of Cyclin D1 was observed in refed retinas.

(B) Re-feeding with 60% L15 results in the reactivation of mTOR signalling in the CMZ as indicated by increased pS6 expression specifically in the proliferating progenitor cells. Scale bars = 50 μ m

Supp. Figure 7



Sup.Fig.7 bpV has no significant effects on control retinas

(A) Treatment with bpV did not significantly change pS6 levels in control retinas (n=4, 12 embryos/condition). Error bars show 95% C.I. Unpaired t test -***p<0.001, **p<0.01, *p<0.05. (B) Levels of EdU incorporation were not significantly different to controls (n=4, 12 embryos/condition). Error bars show 95% C.I. Unpaired t test. (C) Expression of cell cycle regulators, proneural genes (D) and progenitor/ stem cell markers (E) was not affected by bpV treatment in control retinas.