Supplemental Information

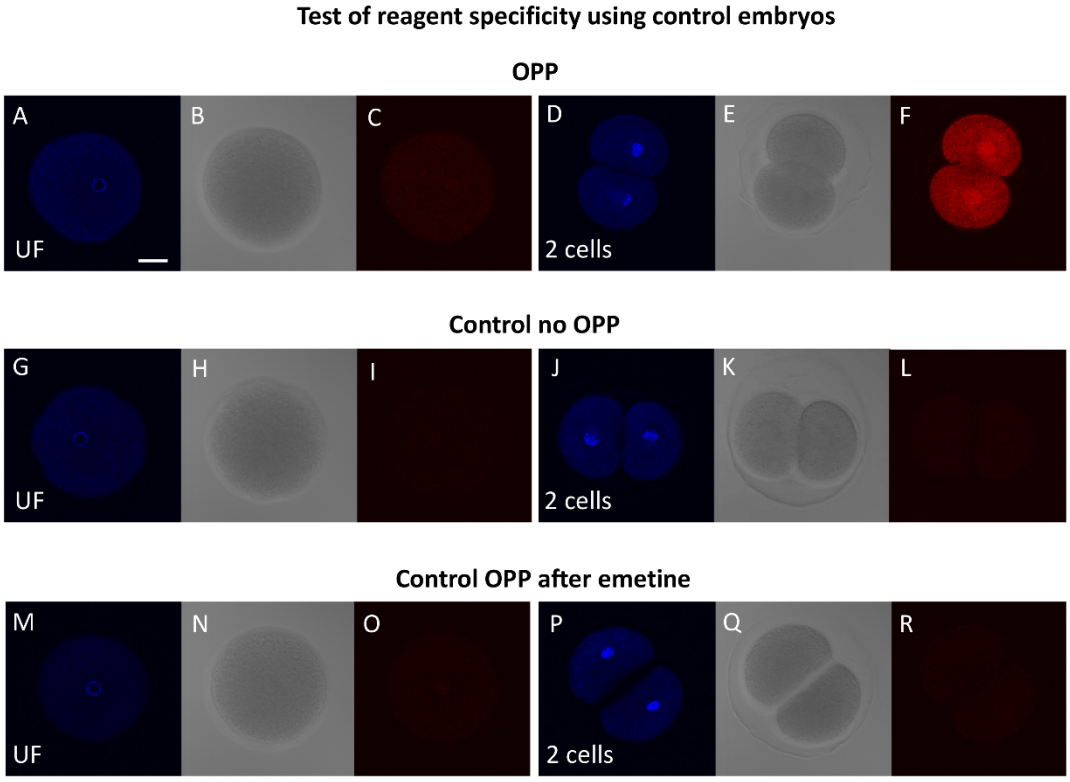

Figure S1: OPP specifically labels protein synthesis in sea urchin embryos. Unfertilized eggs, UF (A,B,C) and 2 cell stage embryos (D,E,F) were incubated with OPP. For each stage, controls are shown using no OPP (G to L), or using OPP in presence of 1mM emetine (M to R), a translational inhibitor. After the click it reaction, protein synthesis was only detected in the 2 cell stage embryos treated with OPP. Approximately one hundred embryos were visualized and representative embryos are presented. Scale bar, 20 μm.

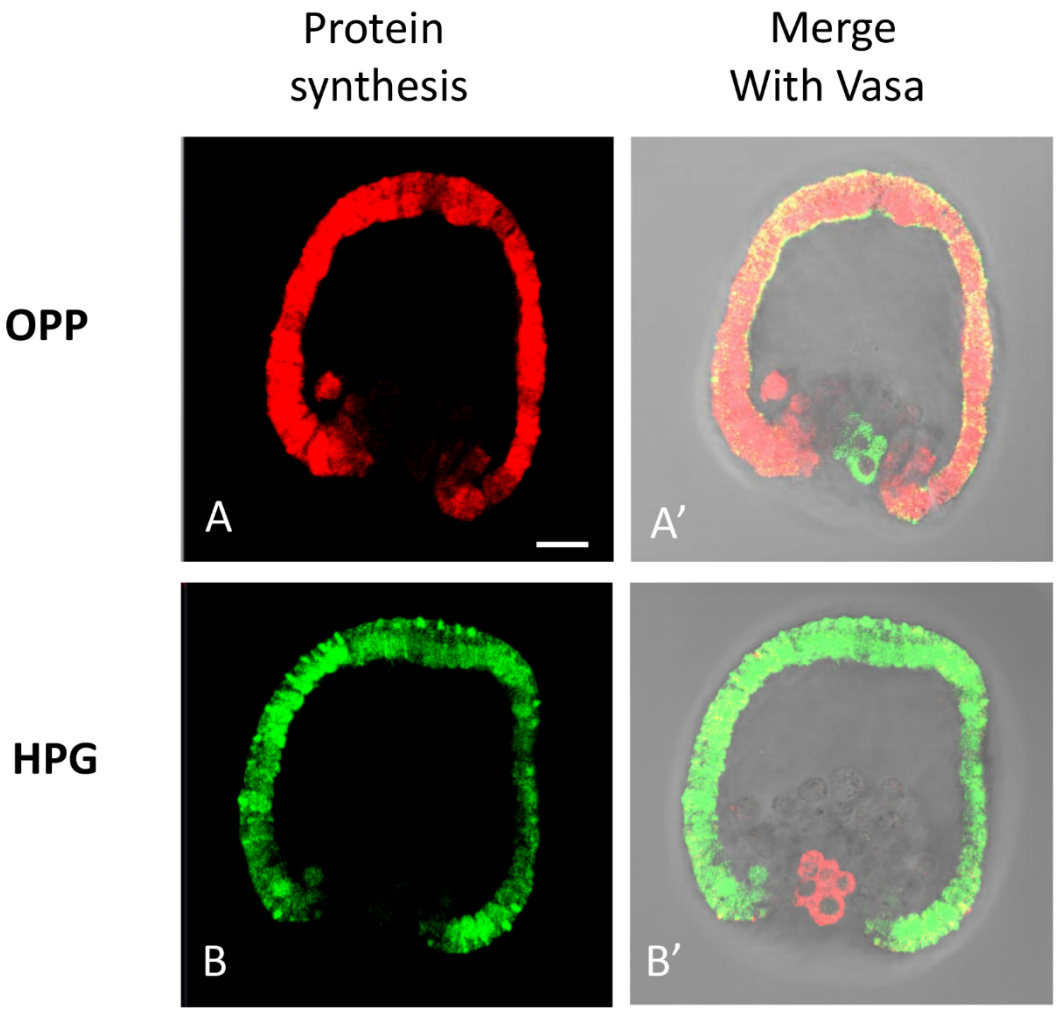

Figure S2: Protein synthesis, measured with OPP and HPG, is reduced in the PGCs. Embryos at blastula stage were treated with either OPP (red in A and A') or HPG (green in B and B') for 30 minutes. After the Click-iT reaction and the vasa immunofluorescence (green in A' and red in B'), embryos were imaged. Protein synthesis is barely detectable in the PGCs. Approximately one hundred embryos were visualized and representative embryos are presented. Arrows indicate the PGCs. Scale bar, 20 µm.

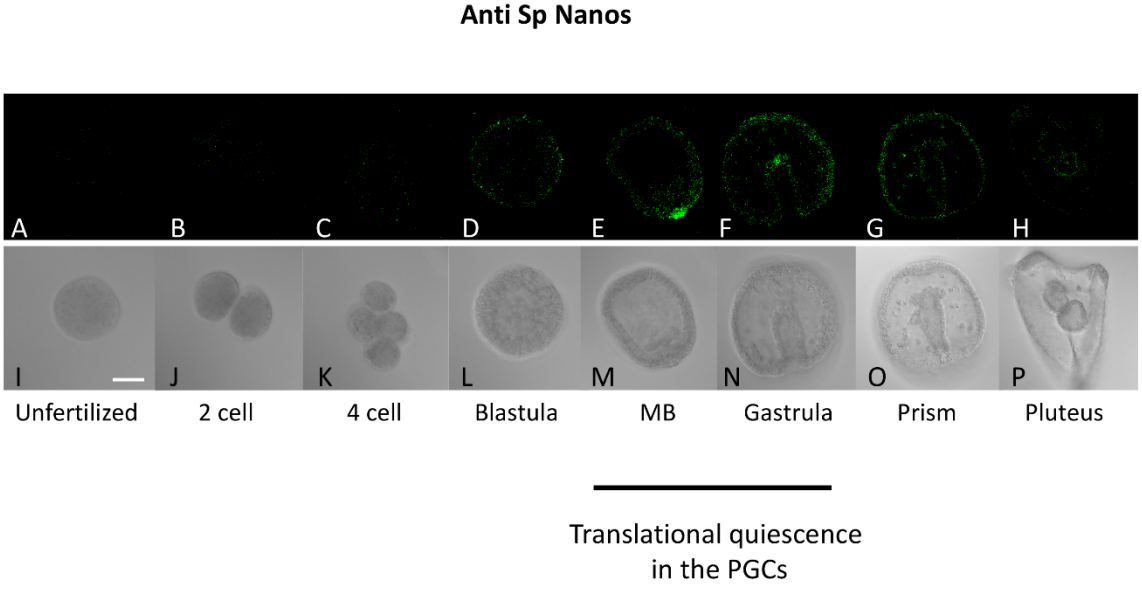

Figure S3: Expression of *Sp* Nanos2 protein during the early development of the sea urchin embryos. Immunofluorescence using *Sp* Nanos 2 antibody (A to H). Images were taken using the same microscope settings (laser intensity, pin-hole opening) at 400x magnification. The corresponding brightfield images are shown from I to P. Approximately one hundred embryos were visualized and representative embryos are presented. Arrows indicate the PGCs. Scale bar, 20 µm.

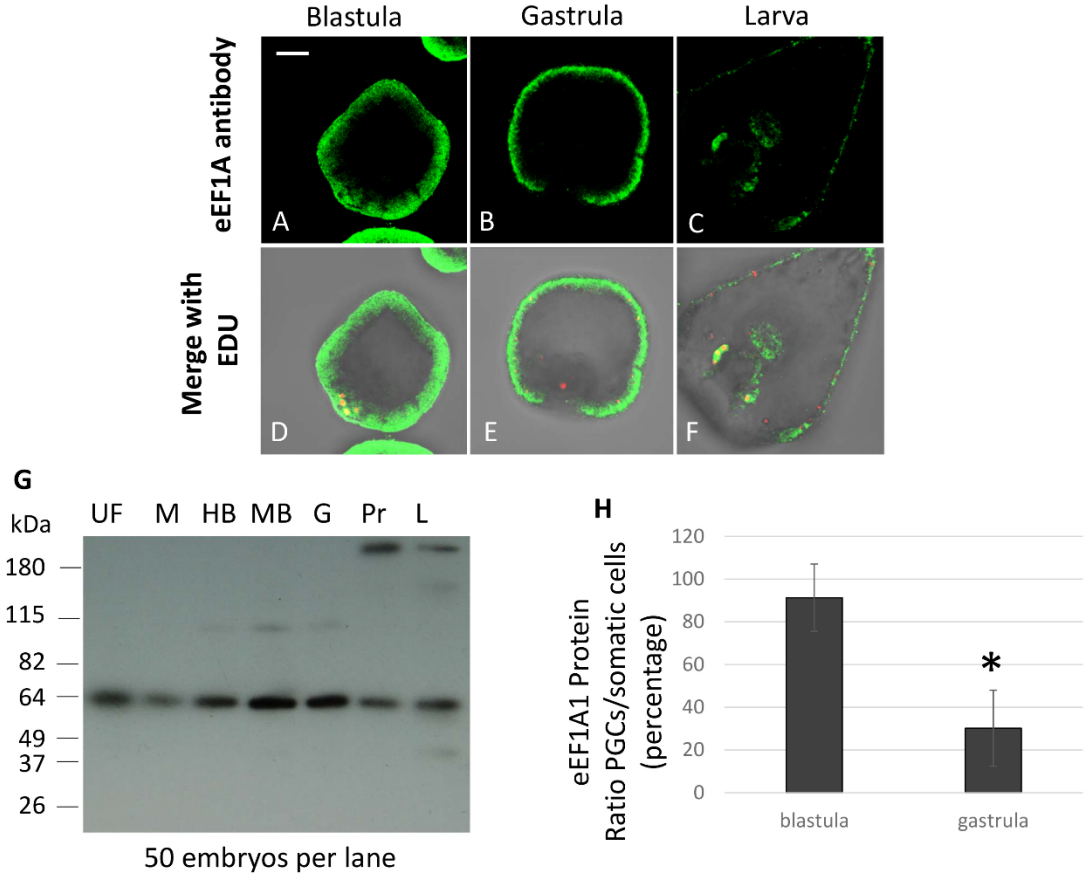

Figure S4: eEF1A protein is transiently excluded from the PGCs between blastula and early gastrula development. Embryos were fixed at different time points to test the expression of the protein eEF1A during the development. Using an antibody against eEF1A, the immunofluorescence shows the exclusion of the eEF1A protein (green) from the PGCs labelled with Edu (red). By Western blot (G), the antibody recognizes one main protein band in unfertilized eggs (UF), morula (M), hatched blastula (HB), mesenchyme blastula (MB), gastrula (G), prism (Pr) and 3 day larvae (L). The immunofluorescences (A, B, C) were used to quantify (H) the eEF1A protein exclusion from the PGCs compared to the somatic cells using 9 blastulae and 13 gastrulae. Significance was assessed Student *t* test ($P<0.001$). Approximately one hundred embryos were visualized and representative embryos are presented. Scale bar, 20 µm.

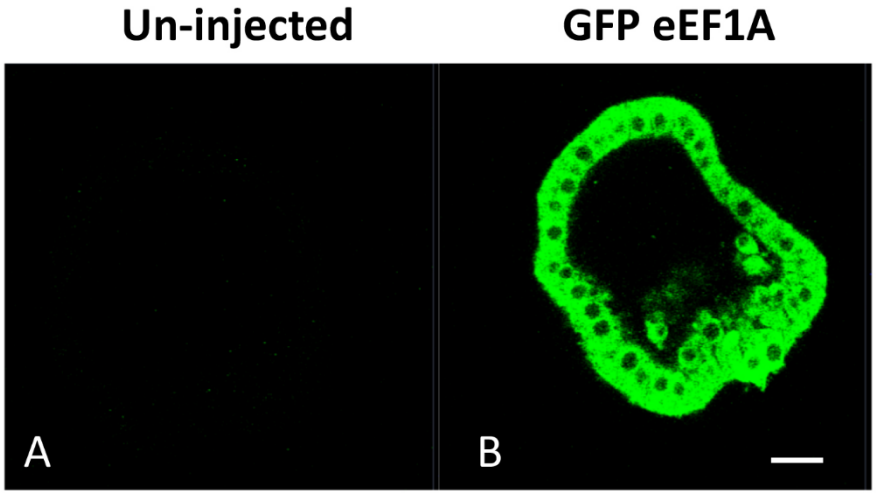

Figure S5: The protein GFP eEF1A is expressed throughout the blastula. An mRNA coding for a GFP eEF1A fused to a 3'UTR lacking the PRE was injected in fertilized eggs. The expression of the GFP eEF1A was observed at the blastula stage (B). Un-injected blastulae were used as a control (A). Scale bar, 20 µm.

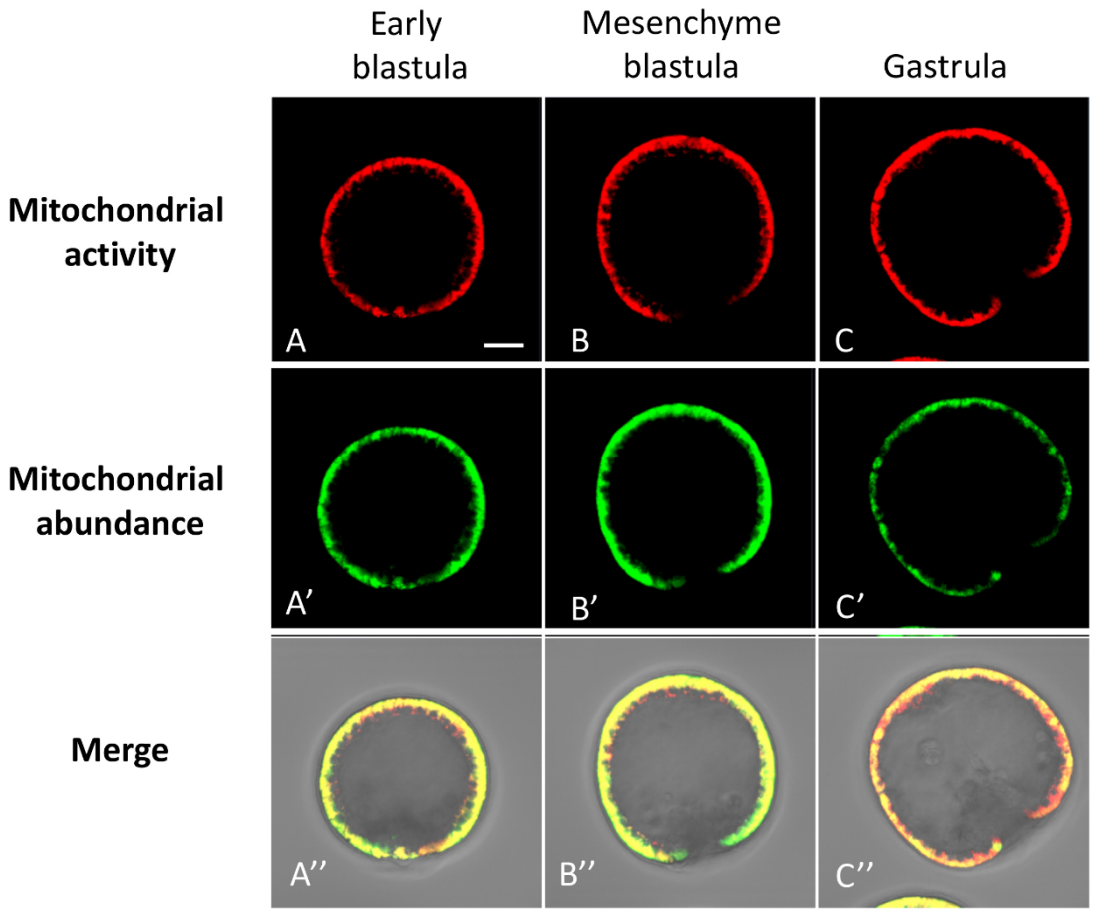

Figure S6: Mitochondrial activity is reduced in the PGCs. Embryos were co-labelled with Mitotracker red and Mitotracker green. Both mitochondrial activity (A to C), and mitochondrial abundance (A' to C') are reduced in the PGCs. A, A' and A" represent the same embryo. Approximately one hundred embryos were visualized and representative embryos are presented. Scale bar, 20 μm.

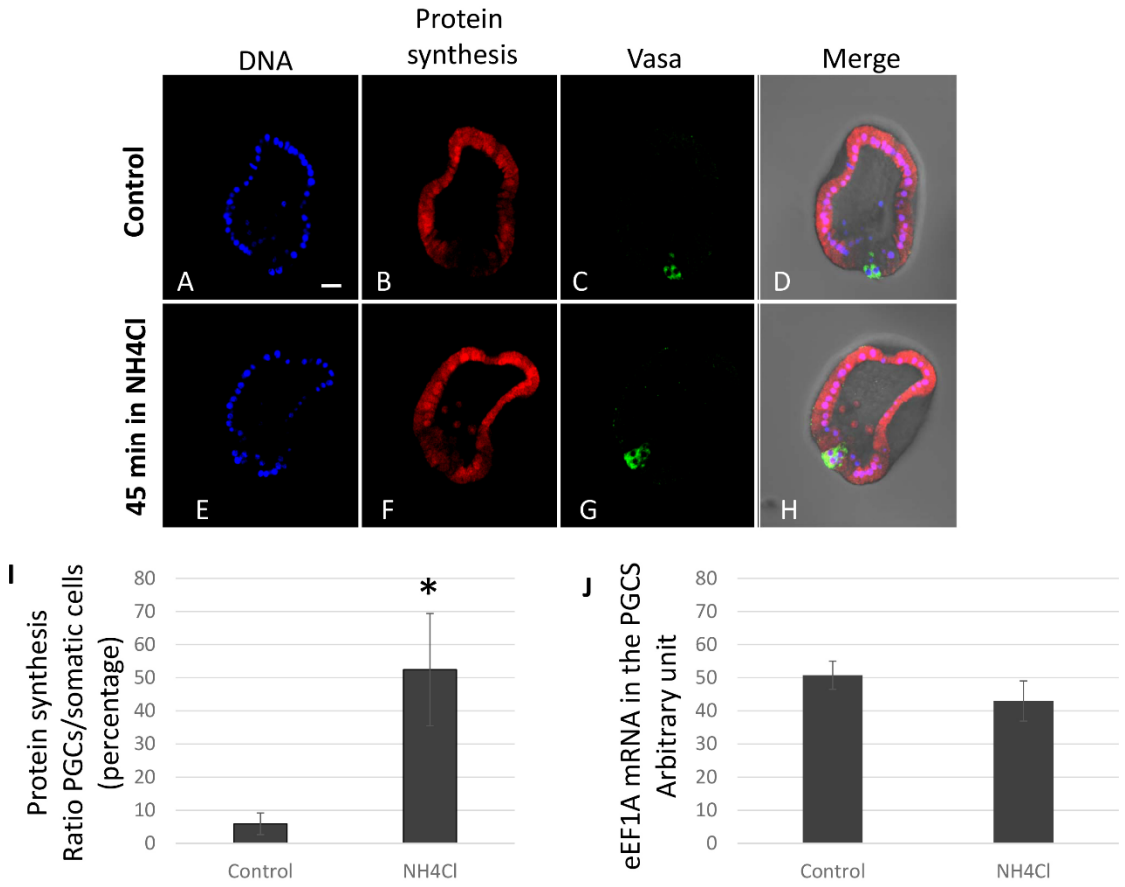

Figure S7: The transient translational quiescence is pH dependent. Blastulae were treated with 10mM NH4Cl pH8 for 45 minutes, OPP was added after 15 minutes of treatment, for an additional 30 minute co-incubation with NH4Cl. Control blastulae were cultured in absence of NH4Cl, but were also treated with OPP. The nuclei are represented in blue (Hoechst), protein synthesis in red, and vasa immunofluorescence in green. The ratio of OPP between the PGCs and the somatic cells was quantified using 11 blastulae for the control, and 12 for the NH4Cl treatment (I). Significance was assessed between the control and the NH4Cl treated embryos with the use of Student *t* test ($P<0.001$). The level of eEF1A mRNA was also quantified in the PGCs, in the presence or absence of NH4Cl (J). No statistical significance was detected in the eEF1A mRNA levels between control and ammonium chloride treated embryos. Approximately one hundred embryos were visualized and representative embryos are presented. Scale bar, 20 μm. between blastula and gastrula with the use of