



**Figure S3** Nuclear localizations of HIF1 $\alpha$  in mouse oocytes and pre-implantation embryos. **a** Oocytes at the germinal vesicle (GV) were immuno-stained simultaneously with antibodies against H3K23la (Red) and HIF1 $\alpha$  (Green). **b** HIF1 $\alpha$  was almost undetectable in early pre-implantation embryos. Immunofluorescence staining for H3K23la (Red) and HIF1 $\alpha$  (Green) in pre-implantation embryos at the 2-cell (2-cell), 4-cell (4-cell), morula (Morula) and blastocyst (Blast) stages obtained from the atmospheric oxygen group and the hypoxia group. DNA was stained with DAPI (Blue). More than 10 embryos were examined in each stage each condition. Scale bars: 20  $\mu$ m.