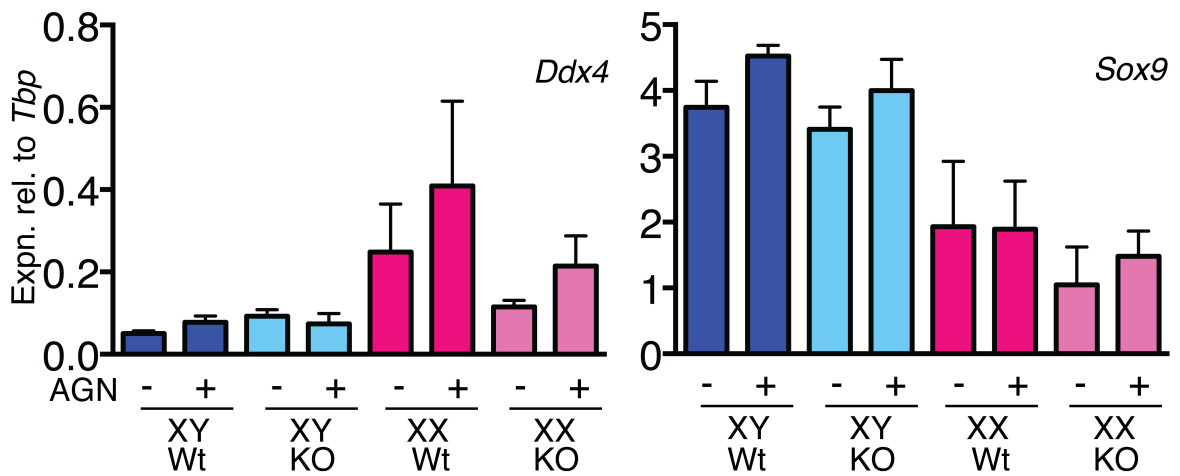


Supplementary Figure 1.

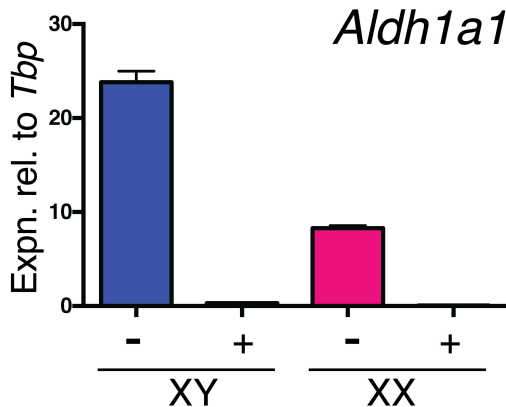
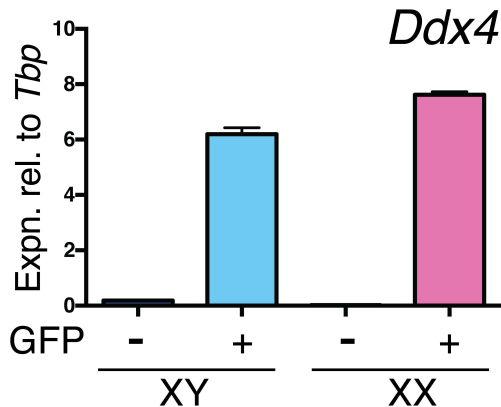
Retinoic acid (RA) is detectable in the developing mouse ovary. LacZ reporter gene activity demonstrated in ovary (XX) but not testis (XY) dissected from 13.5 dpc RARE-lacZ transgenic embryos. RARE; RA response element. Scale bar, 20 μ m.



Supplementary Fig. 2.

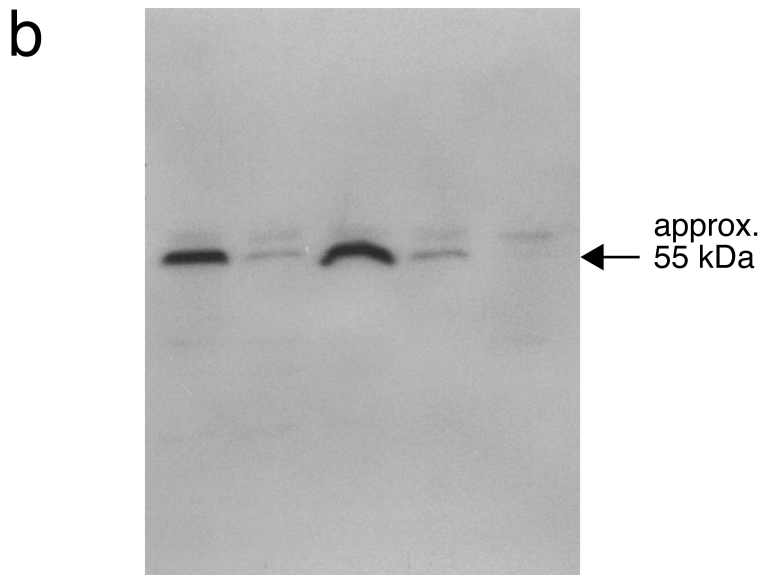
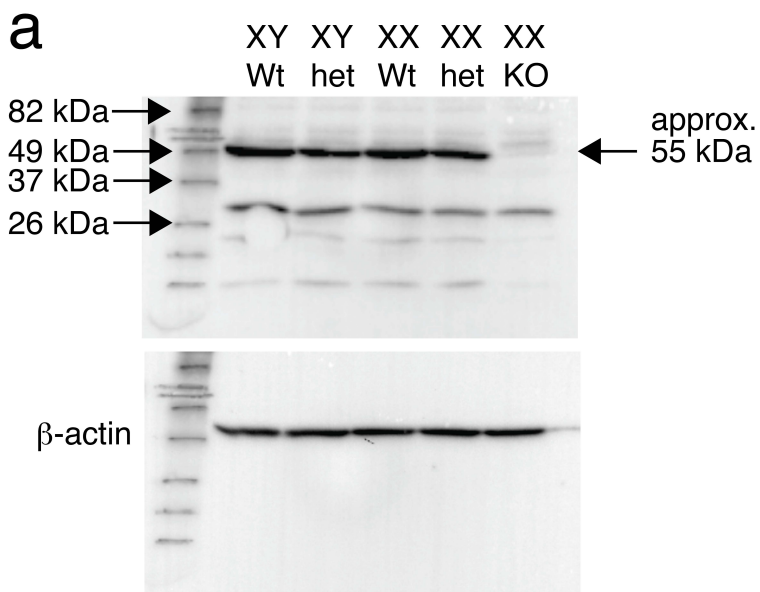
Culture in RA receptor antagonist does not induce generalized toxicity in cultures.

11.5 dpc urogenital ridges were dissected from wild type (Wt) or *Cyp26b1* knockout (KO) embryos and cultured for 50 hours in the presence or absence of a pan RA receptor antagonist, AGN193109 (AGN) and *Mvh* and *Sox9* expression were measured by qRT-PCR (mean + S.E.M.; n=6,6,7,7,3,3,2,2).



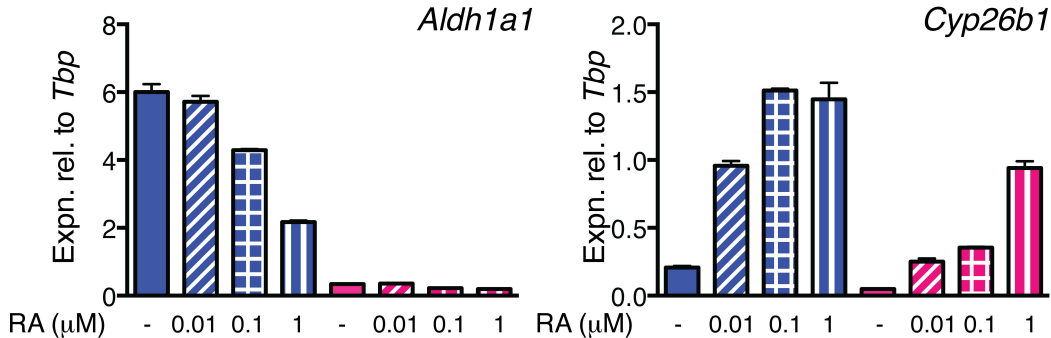
Supplementary Figure 3.

***Aldh1a1* is predominantly expressed by somatic cell and not germ cells.** Somatic cells (GFP-) and germ cells (GFP+) were isolated by fluorescence-activated cell sorting (FACS) from 12.5 dpc testes (XY) and ovaries (XX) of the Oct4 Δ PE:eGFP line and subjected to quantitative reverse transcription PCR (qRT-PCR). Near absence of *Ddx4* (*Mvh*) expression in somatic pools demonstrates that there is very little germ cell contamination. Most *Aldh1a1* expression is observed in the somatic pool demonstrating that germ cells do not express appreciable levels of *Aldh1a1*. Mean + S.E.M. is shown for technical replicates (n = 3). GFP; green fluorescent protein.



Supplementary Fig. 4.

(a) Anti-ALDH1A1 antibody is specific for a band of approximately 55 kDa. By Western blot analysis a band of approximately 55 kilodaltons (kDa) is detected in wildtype eye tissue but not in retinal tissue of XX KO embryo at 14.5 dpc. The blot was probed with anti- β -actin antibody to demonstrate similar loading of all lanes. The predicted molecular weight for *Aldh1a1* is 55 kDa. The marker used is BenchMark Pre-Stained Protein Ladder (LifeTechnologies) (b) Full blot of the ALDH1A1 panel shown in Fig. 3c. In gonadal tissue extracts the anti-ALDH1A1 antibody detects one major band that is not detected in mesonephric tissue.



Supplementary Figure 5.

***Aldh1a1* expression responds to levels of RA present.** 11.5 dpc urogenital ridges (UGRs) were cultured for 22 hours in the presence of varying doses of all-trans RA as indicated. Each culture included 6 or 7 UGRs from distinct embryos. Increasing concentration of RA induced *Cyp26b1* expression and diminished *Aldh1a1* expression. Error bars (mean + S.E.M.) report technical replicates (n = 3).