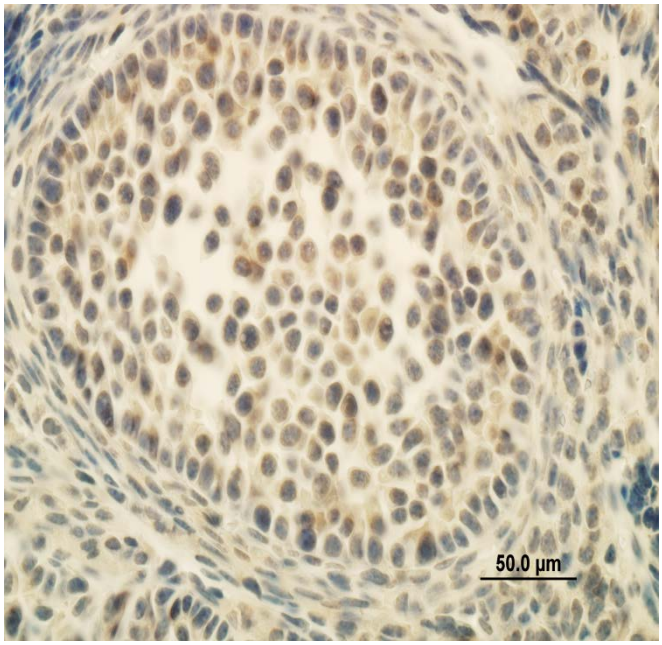
Supplemental Information

Genetic Deficiency of *Mtdh* in Mice Causes Male Infertility via Impaired Spermatogenesis and Alterations in the Expression of Small Non-coding RNAs

Xiangbing Meng, Shujie Yang, Yuping Zhang, Xinjun Wang, Renee X. Goodfellow, Yichen Jia, Kristina W. Thiel, Henry D. Reyes, Baoli Yang, and Kimberly K. Leslie

WT



***Mtdh*$^{-/-}$**

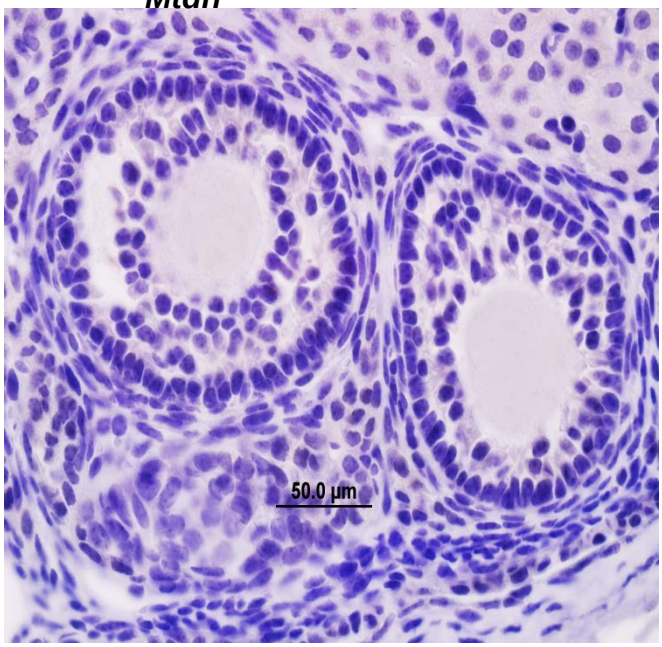


Figure S1. Expression of Mtdh in ovaries from WT but not *Mtdh* exon 3-deficient mice.

Table S1A. Genotypes of the litters generated by breeding *Mtdh*$^{+/-}$ male and *Mtdh*$^{+/-}$ female mice.

Litter	Number of mice (% of total)			
	Mtdh$^{+/-}$	*Mtdh*$^{-/-}$	*Mtdh*$^{+/+}$	Total
#8486	3 (33%)	0	6(66%)	9
#8487	3 (42.9%)	0	4(57.1%)	7
#8529	2 (33%)	0	4(66%)	6
#8539	3 (33%)	0	6(66%)	9
#8540	4 (80%)	0	1(20%)	5
#8593	1 (20%)	1(20%)	3(60%)	5
#8600	2 (22%)	0	7(78%)	9
#8612	2 (33%)	0	4(66%)	6
#8642	2 (33%)	1(16.6%)	3(50%)	6
#8650	2 (25%)	1(12.5%)	5(62.5%)	8
#8664	2 (33%)	0	4(66%)	6
#8667	5 (83.3%)	0	1(16.7%)	6
#8677	1(14.3%)	1(14.3%)	5(71.4%)	7
#8695	2(40%)	1(20%)	2(40%)	5
#8697	3(50%)	1(16.7%)	2(33.3%)	6
#8704	2(66.7%)	0	1(33.3%)	3
#8718	3(50%)	1(16.7%)	2(33.3%)	6
#8724	4(50%)	1(12.5%)	3(37.5%)	7
#8736	2(66.7%)	0	1(33.3%)	3
#8763	2(50%)	0	2(50%)	4
#8764	3(60%)	0	2(40%)	5
#8768	5(71.4%)	0	2(28.6%)	7
#8782	2 (33.3%)	0	4(66.7%)	6
#8783	2(22.2%)	1(11.1%)	6(66.7%)	9
Total	**62 (41.3%)**	**9 (6%)**	**79 (52.7%)**	**150**

Table S1B. No litters were generated from crossing *Mtdh*$^{-/-}$ male mice with *Mtdh*$^{+/-}$ female mice.

Mtdh$^{-/-}$ (male)	Number of litters
#8562-4	0
#8677-4	0
#8695-1	0
#8697-5	0
#21596-1	0
#21598-4	0
#21599-3	0
#21607-5	0
#21609-1	0
#21348-1	0
#21315-4	0
#21537-1	0
Total	**0**

Table S1C. Genotypes of the litters generated from crossing *Mtdh*$^{-/-}$ female mice with *Mtdh*$^{+/-}$ male mice.

	Number of mice		
Litter	*Mtdh*$^{+/-}$	*Mtdh*$^{-/-}$	Total
#8599	4 (100%)	0	4
#8619	4 (100%)	0	4
#8698	4 (66.7%)	2(33.3%)	6
#8749	3 (100%)	0	3
#8786	3 (100%)	0	3
#8797	1 (100%)	0	1
Total	**19(90.5%)**	**2 (9.5%)**	**21**

Table S2: Effect of deficiency of *Mtdh* on miRNA expression in liver. Five microRNAs down-regulated in *Mtdh*-deficient testes were examined in the liver using the TaqMAN® microRNA RT-qPCR kit from Applied Biosystems (*p<0.05, **p<0.01).

miRNA	Average ΔCt		$Mtdh^{-/-}$ vs. WT	
	***Mtdh*$^{-/-}$**	**WT**	**Fold Change**	**P-value**
mmu-miR-101b-3p	0.949	1.338	1.309	0.0005**
mmu-miR-16-2-3p	10.318	10.998	1.602	0.4050
mmu-miR-182-5p	8.805	9.449	1.562	0.1865
mmu-miR-19b-3p	1.749	2.449	1.624	0.0325*
mmu-miR-340-5p	5.891	6.943	2.074	0.0001**