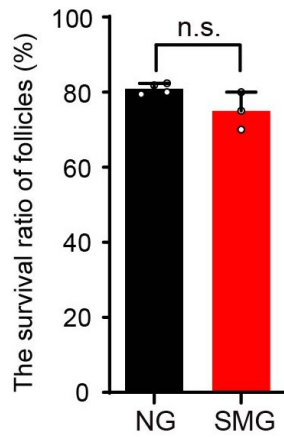


- 1 **Supplementary information**
- 2 **Simulated microgravity reduces quality of ovarian follicles and oocytes by**
- 3 **disrupting communications of follicle cells**
- 4



5

6 **Supplementary Fig. 1 SMG treatment had no effect on the survival of follicles.** The

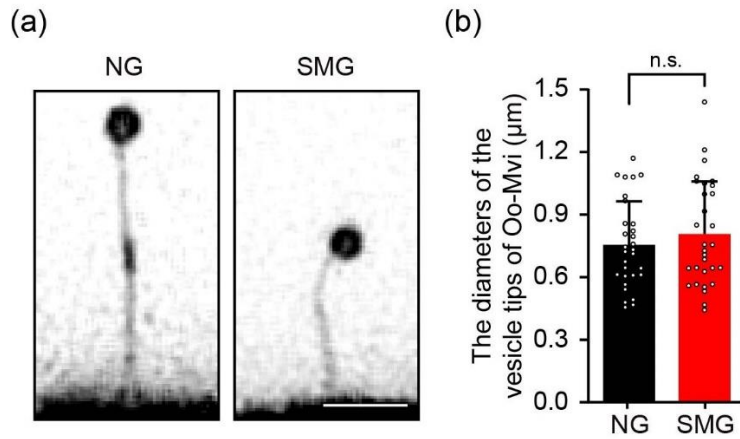
7 statistical analysis of the survival ratio of follicles, showing no difference in follicle

8 survival in the SMG group (n = 36) compared to that in the NG group (n = 27). p value

9 = 0.17. Data are presented as the mean  $\pm$  SD. Data were analyzed by two-tailed unpaired

10 Student's *t*-test and n.s.  $P \geq 0.05$ .

11



12

13 **Supplementary Fig. 2 A normal development of the vesicles in Oo-Mvi under SMG**

14 **conditions. a** High-resolution images showing a comparable diameter of vesicles on

15 the tip of Oo-Mvi after SMG treatment and NG treatment. Scale bars: 3 µm. **b**

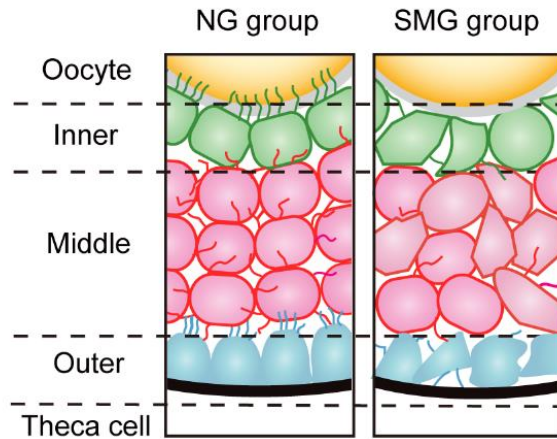
16 Quantification of vesicle diameters of Oo-Mvi showed no significant difference in

17 vesicle size in the SMG-treated oocytes (n = 30) compared to that in the NG oocytes (n

18 = 30). p value = 0.39. Representative images are shown. Data are presented as the mean

19 ± SD. Data were analyzed by two-tailed unpaired Student's *t*-test and n.s.  $P \geq 0.05$ .

20



21

22 **Supplementary Fig. 3 Simulated microgravity markedly affected the cellular**

23 **polarity and the extension of the cellular projections of GCs in follicles.** Illustration

24 of the characteristics of GCs in three different layers of growing follicles. In the NG

25 group, GCs in inner layer (I-GCs) are polar and protrude numerous GC-TZPs towards

26 the oocytes (Green, left); in middle layers, GCs (M-GCs) are no polarity and extend a

27 few random cellular projections towards surrounding cells (Red, left); GCs in outer

28 layer (O-GCs) have a few cellular projections towards the middle layers of GCs (Blue,

29 left). However, compared to GCs in the NG group, I-GCs (Green, right) and O-GCs

30 (Blue, right) of the SMG group exhibit a loss of polarity shape and the shape of

31 numerous GCs in three layers is irregular. I-GCs show a failure of GC-TZPs compared

32 to the NG group (Red, right).

33

34 **Supplementary Table 1. Primer sequences used for QRT-PCR analyses**

35

Gene	Sequence
<i>β-actin</i>	GTGACGTTGACATCCGTAAAGA GCCGGACTCATCGTACTCC
<i>Gdf9</i>	TCACCTCTACAATACCGTCCGG GAGCAAGTGTTCCATGGCAGTC
<i>Bmp15</i>	GCACGATTGGAGCGAAAATG CGTACGCTACCTGGTTTGATGC
<i>Fgf8</i>	CAGGTCTCTACATCTGCATGAACAA TCTCCAGCACGATCTCTGTGAATA
<i>Fscn1</i>	AGAACGCCAGCTGCTACTTT CGAGGAATCACTACCCACCG
<i>Myo10</i>	TCCAGACAGACTATGGGCAGG GGAAGCCATGTCGTCCACG

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