**Supplementary File 4 - Top 10 markers from each granulosa subclusters**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Preantral-Cumulus** | avg\_log2FC | **Antral-Mural** | avg\_log2FC | **Atretic** | avg\_log2FC | **Mitotic** | avg\_log2FC |
| Gatm (1) | 2.13 | Inhba (2,3) | 2.25 | Ghr | 1.85 | Top2a (4) | 2.30 |
| Kctd14 (5) | 2.05 | Nppc(6–8) | 2.01 | Pik3ip1 (9) | 1.80 | Ube2c (10) | 2.11 |
| Igfbp5 (5) | 1.87 | Mro (11,12) | 2.00 | Cald1 (13) | 1.78 | Racgap1 (14,15) | 1.97 |
| Col18a1 | 1.86 | Nap1l5 (16) | 1.70 | Itih5 | 1.63 | Birc5 | 1.96 |
| Pcsk6 (17) | 1.85 | Hsd17b1 (1) | 1.59 | Cfh | 1.61 | Ccna2 (18,19) | 1.95 |
| Slc18a2 (20) | 1.84 | Slc26a7 (21) | 1.56 | Asb4 | 1.56 | Ccnb2 | 1.86 |
| Fndc5 (22) | 1.79 | Grem1 (3) | 1.54 | Ctgf | 1.51 | Hmgb2 (23) | 1.85 |
| Wt1 (1,24–27) | 1.78 | X1110032F04Rik | 1.53 | Ntn4 (13) | 1.51 | Cdca8 (28) | 1.81 |
| Tmem184a (5) | 1.77 | Cyp19a1 (29) | 1.52 | Cdc42ep3 | 1.44 | Cdk1 (30,31) | 1.80 |
| X1190002N15Rik | 1.74 | Tom1l1 | 1.39 | Fhl1 | 1.40 | Prc1 | 1.75 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Luteinizing mural** | avg\_log2FC | **Active CL** | avg\_log2FC | **Mitotic-Antral** | avg\_log2FC | **Regressing CL** | avg\_log2FC |
| Tinagl1 (32) | 2.90 | Neat1 (33) | 2.13 | Ccnb2 (34,35) | 1.94 | Ptgfr (13,36) | 2.74 |
| Adamts1 (11,37) | 2.50 | Col3a1 (3) | 2.09 | Ube2c (10) | 1.83 | Efhd1 (38) | 2.50 |
| Mrap (13) | 2.45 | Igfbp7 (39) | 2.03 | Cenpa | 1.75 | S100a6 (40,41) | 2.47 |
| Prss35 (42) | 2.40 | Sfrp4 (43,44) | 1.82 | Top2a (4) | 1.74 | Tnc (11,43) | 2.42 |
| Mt2 (30,45,46) | 2.30 | Cyp11a1 (47) | 1.70 | Racgap1 (14,15) | 1.73 | Lipg (48) | 2.37 |
| Parm1 (49) | 2.26 | Plin4 | 1.71 | Birc5  | 1.72 | Sfrp4 | 2.28 |
| Loxl2 (50) | 2.25 | Onecut2 | 1.71 | Inhbb (1,3) | 1.62 | Lgmn | 2.27 |
| S100a6 (41) | 2.22 | Col1a2 (51) | 1.96 | Ccna2 (18,19) | 1.61 | Star | 2.25 |
| Cemip | 2.20 | Col1a1 (52) | 1.84 | Nap1l5 (16) | 1.60 | Akr1c18 (45,53) | 2.24 |
| Cdkn1a | 2.14 | Gm42669 | 1.75 | Cdca8 (28) | 1.59 | Sgk1 | 2.21 |

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