

**Supplementary Table SVII** Biological processes and cellular components for the transcripts enriched in AMA GV and MII oocytes, exclusively in the GV/MII transition.

| AMA MII only |  | Category | Term | Count | %   | P-value | Benjamini | FDR    |
|--------------|--|----------|------|-------|-----|---------|-----------|--------|
|              |  |          |      |       |     |         |           |        |
| BP           | Positive regulation of transcription, DNA-templated                  |          |      | 36    | 0.0 | 3.0E–5  | 6.9E–2    | 5.3E–2 |
| BP           | Positive regulation of transcription from RNA polymerase II promoter |          |      | 56    | 0.1 | 4.8E–5  | 5.5E–2    | 8.5E–2 |
| Category     | Term   |          |      | Count | %   | P-value | Benjamini | FDR    |
| CC           | Nucleus  |          |      | 234   | 0.2 | 2.6E–9  | 1.2E–6    | 3.7E–6 |
| CC           | Nucleoplasm  |          |      | 138   | 0.1 | 1.2E–8  | 2.7E–6    | 1.7E–5 |
| CC           | Cytoplasm  |          |      | 218   | 0.2 | 2.9E–7  | 4.6E–5    | 4.1E–4 |
| CC           | Nuclear speck  |          |      | 20    | 0.0 | 1.7E–5  | 2.0E–3    | 2.5E–2 |
| AMA GV only  |  | Category | Term | Count | %   | P-value | Benjamini | FDR    |
|              |  |          |      |       |     |         |           |        |
| BP           | Mitochondrial electron transport, NADH to ubiquinone                 |          |      | 17    | 0.0 | 2.8E–8  | 8.9E–5    | 5.1E–5 |
| BP           | Mitochondrial respiratory chain complex I assembly                   |          |      | 18    | 0.0 | 2.4E–7  | 3.8E–4    | 4.4E–4 |
| BP           | Mitochondrial translational elongation                               |          |      | 20    | 0.0 | 1.2E–6  | 1.2E–3    | 2.1E–3 |
| BP           | Mitochondrial translational termination                              |          |      | 18    | 0.0 | 2.4E–5  | 1.9E–2    | 4.3E–2 |
| Category     | Term   |          |      | Count | %   | P-value | Benjamini | FDR    |
| CC           | Mitochondrion  |          |      | 148   | 0.1 | 2.6E–12 | 1.6E–9    | 3.9E–9 |
| CC           | Mitochondrial inner membrane   |          |      | 69    | 0.0 | 3.0E–12 | 9.0E–10   | 4.4E–9 |
| CC           | Mitochondrial respiratory chain complex I                            |          |      | 16    | 0.0 | 1.6E–7  | 3.1E–5    | 2.3E–4 |
| CC           | Cytosol  |          |      | 260   | 0.1 | 2.5E–5  | 3.9E–3    | 3.8E–2 |
| CC           | Extracellular exosome  |          |      | 219   | 0.1 | 2.0E–4  | 2.4E–2    | 3.0E–1 |

AMA, advanced maternal age; BP, biological process; CC, cellular component; GV, germinal vesicle; MII, metaphase II.