

## **Description of additional supplementary files**

**Supplementary Data 1.** Overview of the human preimplantation embryos used in this study.

**Supplementary Data 2.** Summary of isoform features, including structural categories, predicted coding probabilities, protein domain content, repetitive element integrations, and evolutionary conservation.

**Supplementary Data 3.** Predicted isoform protein coding probabilities and open reading frame (ORF) locations, calculated using CPAT.

**Supplementary Data 4.** Location of protein domains within ORFs of predicted coding isoforms, calculated using PfamScan.

**Supplementary Data 5.** Predicted repetitive element integrations within isoforms, calculated using RepeatMasker.

**Supplementary Data 6.** Summary and QC of integrated multi-omics, independently published embryo datasets.

**Supplementary Data 7.** Known developmental genes displayed in Figure 4D, with relevant citations.

**Supplementary Data 8.** Information on isoform cluster assignments (Figure 5E), isoform cluster-RBP correlations (Figure 5I), and the isoform-RBP network (Suppl. Figure 5D).

**Supplementary Data 9.** Primers for PCR validation of novel genes (Suppl. Figure 8).