Supplementary Table 1. Shape-based features and description

Feature	Description
Major axis length	Length of the longest axis of the oocyte, often used to assess elongation
Minor axis length	Length of the shortest axis of the oocyte, used in combination with the major axis length to evaluate shape and symmetry
Maximum diameter	Longest straight-line distance across the oocyte, providing a key measure of size
Pixel surface	Surface area of the oocyte measured in pixels, used for image-based size estimation
Elongation	Measures how stretched a shape is relative to its longest axis, with lower values indicating more elongated shapes
Sphericity	Measures how close the oocyte is to a perfect sphere (values closer to 1 indicate a more spherical shape)
Perimeter	Total boundary length of the oocyte, indicating surface complexity
Perimeter surface ratio	Ratio of the perimeter to the surface area, providing insight into the roughness or complexity of the boundary