

## Ultrastructural and morphometric evaluation of aged cumulus-oocyte-complexes

Serena Bianchi<sup>1</sup>, Guido Macchiarelli<sup>1</sup>, Giulietta Micara<sup>2</sup>, Cesare Aragona<sup>2</sup>, Marta Maione<sup>3</sup> and Stefania Annarita Nottola<sup>3</sup>

<sup>1</sup> Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy

<sup>2</sup> Department of Gynecology-Obstetrics & Urology "Sapienza" University of Rome Rome, Italy

<sup>3</sup> Department of Anatomy, Histology, Forensic Medicine and Orthopaedics, "Sapienza" University of Rome, Rome, Italy

Maternal age is one of the most significant factors influencing oocyte quality (1). 35 years of age seems to be a watershed in reproductive potential. The aim of this study was to reveal the amount and distribution of specific ultrastructural organelles in human mature cumulus-oocyte-complexes belonging to women of different ages (<35 years old; ≥35 years old/ reproductive aging) and to evaluate their different response during 24 hours prolonged culture (defined as *in vitro* aging) (1). The samples were studied by light and transmission electron microscopy; a morphometric analysis of TEM data was performed (2). In all aged samples, the amount of mitochondria-smooth endoplasmic reticulum aggregates, cortical granules and microvilli decreased ( $p < 0,05$ ), while the amount of mitochondria-vesicle complexes increased up ( $p < 0,05$ ). Occasional vacuoles were found in oocytes from older women after *in vitro* aging. A significant ( $p < 0,05$ ) increase of zona pellucida thickness was linked to the donor age but not to *in vitro* aging. A re-compaction of cumulus cells was seen in *in vitro* aged samples. Morphometric data strongly confirmed our preliminary results (3) revealing that: i) reproductive aging and *in vitro* aging share specific ultrastructural features ii) *In vitro* aging can be considered a model for reproductive aging iii) young oocytes seem to be less sensitive to *in vitro* aging than older ones. The above results may represent a reliable background for further multidisciplinary studies regarding aged oocytes and may be also useful in clinical settings.

### References

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### Key words

Ultrastructure, human oocyte, aging, morphometry.