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— From Innovation to Impact —

Session PO2-11b - Reproductive Biology II

Add To Itinerary

F-243 - Implications of Telomere Biology in Female Reproductive Aging Using the SAMP8 Mouse Model.

March 15, 2019, 9:00 AM - 11:00 AM | Hall Maillot

Categories
+11.3 - Basic Reproductive Biology: Ovarian Biology, Reproductive Aging

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Aging,Ovary,Telomere

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Abstract

Introduction: Nowadays, one of the main causes of infertility is the delay of childbearing because of the depletion of follicular reserve during aging. However, some women reach this state prior to the normal age of menopause and the causes are still poorly understood. In addition, how this process may affect the embryo has not been studied. Telomeres, which protect chromosomes, are a primary pathway involved in aging. Because telomere length shortens with age, the proliferative capacity of cells is limited, compromising organ regeneration and function. Nevertheless, the connection of telomeres in ovarian aging and fertility is largely unknown. We investigated the implication of the telomeres in the reproductive system and fertility.

Objective: To uncover telomeric mechanisms underlying ovarian aging and development.

Methods: We used SAMP8 mice as a model of accelerated female reproductive senescence. SAMR1 mice, which has the same background but do not present accelerated aging, was selected as control for the experiments. Ovaries from young (3 months old) and middle-age (7 months old) SAMP8 and SAMR1 mice were collected and cryostate sections of whole ovarian tissue were obtained. The length of the telomeres was measured in these samples by quantitative fluorescent in situ hybridization (QFISH). Imagines were acquired by confocal microscopy and analysed by DEFINIENS program. In addition, to evaluate telomere biology during development we have generated mouse embryonic fibroblast (MEF) from 13.5-days embryos that come from SAMP8 and SAMR1 young and middle-age mice. We blocked these cells in metaphase and analysed the existence of telomeric aberrations by using QFISH and confocal microscopy.

Results: QFISH analysis of complete ovarian tissue shows a decrease in telomere length during aging in SAMP8 mice. Ovaries from 7 months old mice have shorter telomeres than those of 3 months old (p value <0.0062). MEFs of SAMP8 mice show a significant number of telomeres with aberrations, even those that come from young mothers. Specifically, SAMP8 MEFs presents high levels of multitelomeric signals in comparison with control mice.

Conclusion: Our data shows telomeric alterations in the SAMP8 mouse that affect the early stages of development. Given the relationship between telomeres and aging, telomeric alterations in SAMP8 mice may promote their accelerated reproductive aging.