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Discipline: Pathology/molecular and cellular medicine

Title: Epigenetic reprogramming during oogenesis: unravelling the link with oocyte developmental competence and with offspring health

Abstract: During oogenesis, an extensive epigenetic reprogramming occurs. This process is of major importance, as oocyte methylation can affect gene expression after fertilization. Furthermore, maternal-effect products are stored in the oocyte, which are necessary for epigenetic reprogramming after fertilization and hence for embryo and trophoblast development. There is increasing awareness that adverse conditions during folliculogenesis and oogenesis may affect fertility, oocyte developmental capacity and the health of the offspring through an alteration of epigenetic reprogramming. Follicle Biology Laboratory (FOBI) has developed standardized in vitro follicle and oocyte culture systems (in the mouse model) generating mature oocytes with the capacity to develop into live offspring. Moreover, FOBI has defined a series of epigenetic markers for oocyte and embryo quality. These bioassays provide unique possibilities to study the effects of adverse nutritional or metabolic conditions (such as diabetes) during folliculogenesis and oogenesis on fertility and adult offspring health. This model can also be used to test the safety of in vitro growth systems and of culture media for oocytes and follicles. The close collaboration with the fertility clinic of UZ Brussel allows FOBI to have access to human follicles and oocytes for translation of the in vitro mouse research to relevant pathologies in human.

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