

## 9<sup>th</sup> Yazd International Congress and Student Award on Reproductive Medicine with 4<sup>th</sup> Congress of Reproductive Genetics

### Poster Presentations

#### P-3

#### Bone morphogenetic protein 15 induces differentiation of mesenchymal stem cells derived from human follicular fluid to oocyte-like cell

Taheri Moghadam M<sup>1, 2, 3</sup>, Saki Gh<sup>2</sup>, Nikbakht R<sup>3</sup>, Eftekhari Moghadam AR<sup>1, 2</sup>.

1. Cellular and Molecular Research Center, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

2. Department of Anatomical Science, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

3. Fertility, Infertility and Perinatology Center, Imam Khomeini Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Email: mahintaherimoghadam@yahoo.com

**Background:** Follicular fluid (FF) is essential for developing ovarian follicles. Besides the oocytes, FF has abundant undifferentiated somatic cells containing stem cell properties, which are discarded in daily medical procedures. Earlier studies have shown that FF cells could differentiate into primordial germ cells via forming embryoid bodies, which produced oocyte-like cells (OLC).

**Objective:** This study aimed at isolating mesenchymal stem cells (MSC) from FF and evaluating the impacts of bone morphogenetic protein 15 (BMP15) on the differentiation of these cells into OLCs.

**Materials and Methods:** Human FF-derived cells were collected from 78 women in the assisted fertilization program and cultured in human recombinant BMP15 medium for 21 days. Real-time polymerase chain reaction and immunocytochemistry staining characterized MSCs and OLCs.

**Results:** MSCs expressed germline stem cell (GSC) markers, such as OCT4 and Nanog. In the control group, after 15 days, OLCs were formed and expressed zona pellucida markers (ZP2 and ZP3), and reached 20-30 µm in diameter. Ten days after induction with BMP15, round cells developed, and the size of OLCs reached 115 µm. A decrease ranged from 0.04 to 4.5 in the expression of pluripotency and oocytespecific markers observed in the cells cultured in a BMP15-supplemented medium.

**Conclusion:** FF-derived MSCs have an innate potency to differentiate into OLCs, and BMP15 is effective in promoting the differentiation of these cells, which may give an in vitro model to examine germ cell development.

**Key words:** OLC, Follicular fluid, Bone morphogenetic protein 15, Mesenchymal stem cell.

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