The curiosity of culturing animal cells in vitro has begun since early twenty's which can be considered as the basement of the recent novel achievements in assisted reproductive technology (ART) and stem cell biotechnology (1). Later then, the interest in modern biological technologies such as tissue engineering had grate increased to use in the field of cell therapy and regenerative medicine. ART in reproductive medicine, itself is a cell therapy treatment to help infertile couples to have baby. Moreover, reproductive system is one of the major sources to get pluripotent [embryonic stem cells (ESCs), embryonic germ cells (EGCs), and embryonal carcinoma cells (ECCs)], fetal [umbilical cord blood mesenchymal stem cells (UCB-MSCs), amniotic fluid stem cells], and adult [germ-line stem cells (GSCs), endometrial-derived mesenchymal stem cells (EnMSCs)] stem cells. On the other hand, stem cells biotechnology, tissue engineering, and regenerative medicine are trying to help reproductive medicine to cure cell or tissue disorders. In the stem cell session of the 7th Yazd International Congress and Student Award in Reproductive Medicine, first the importance of good manufacturing practice (GMP) for translation of stem cell biotechnology to bedside and safe clinical applications was reminded and emphasized by the keynote speakers and then tissue engineering in reproductive medicine was highlighted by the experts in the field and students.

A recent 3-day, 7th Yazd International Congress and Student Award in Reproductive Medicine which has coordinated with the 2nd congress of reproductive genetics and 1st
congress of reproductive immunology was hosted by the Yazd Reproductive Sciences Institute in Shahid Sadoughi University of Medical Sciences in the Dr. Javadi Hall of the Shahid Sadoughi Hospital, Yazd, Iran on 28-30 April 2017. Here, we collected the papers that presented and discussed at a session entitled: “Stem Cells; GMP and Tissue Engineering” that was held on 29th of April.

At the beginning of the session, Behrouz Afratoonian (Ph.D.) presented a brief history about the progress of stem cell research in Stem Cell Biology Research Center which is based in Yazd Reproductive Sciences Institute. According to his statement, this center has started its activities as a Stem Cell Laboratory in Yazd Research and Clinical Center for Infertility since 2006. During this time, different fields were investigated such as gonocytes (Afratoonian et al reported the useful effect of bone morphogenic protein 4 and retinoic acid on differentiation of BMSCs to primordial germ like cells and spermatogonial stem like cells (15). Also, Leila Mirzaeiyan (M.Sc.) reported

In continue, Aghayan (Ph.D.) stated that in vitro manipulation of cell products requires complex laboratory procedures that increase the risk of possibly of adverse events for the recipients. He emphasized that according to the current international rules and regulations of Iranian Food and Drug Organization, cell therapy products should be manufactured under principles of GMP (9, 10).

Prof. Harry D. Moore, discussed about their experience of derivation and maintaining clinical grade hESC lines, and focused on practical issues faced in the past and those they face in the future. Also, he talked about GMP and the process undertaken and biotechnology of hESC (11, 12).

Stem cells have long been proposed for the treatment of congenital and acquired reproductive system disorders including ovary and testis problems. Human umbilical cord blood (HUCB) are randomly harvested from fetus umbilical cord blood and are preserved for further use in liquid nitrogen. According to Seyed Nouredin Nematollahi (Ph.D.), stem cells from different adult and fetal origins including bone marrow-derived mesenchymal stem cells, Umbilical cord matrix-derived stem cells and Adipose tissue-derived stem cells were compared according to their properties. He claimed that bone marrow-derived mesenchymal stem cells and Adipose tissue-derived stem cells can be harvest from the patients and be used for the treatment of some known disease in the human and animal models. While Wharton's jelly- mesenchymal stem cells (WJ-MSCs) are immune competent and this property make them suitable for transplantation (13, 14).

One of the useful strategies to produce germ cells is to prepare adequate conditions in vitro and in vivo. Saba Behzadi (B.Sc.) reported the useful effect of bone morphogenetic protein-4 and retinoic acid on differentiation of BMSCs to primordial germ like cells and spermatogonial stem like cells (15). Also, Leila Mirzaeiyan (M.Sc.) reported
the successful results of production of oocyte-like cells of mouse anterior abdominal parietal peritoneum mesothelium stem cells in vitro (16).

The next part of the stem cell session was belonged to the reports about tissue engineering in reproductive system. This field is one of the hot topics in treatment of some diseases by make some new biological and non-biological scaffolds to regenerate tissues and organs. Habib Nikukar (M.D., Ph.D.) explained that regenerative medicine can offer clinicians wonderful abilities for treatment. According to his presentation there are three necessary main key elements involve in tissue engineering: cells (pluripotent and multipotent stem cells), scaffold (natural and man-made materials) and stimulant agents. He emphasized that Yazd Reproductive Science Institute is trying to have a GMP approved stem cell line production, various methods of cell therapy research and tissue engineering with special look to the regeneration of male and female reproductive systems and treatment of special challenging diseases (17, 18).

Mahdiyeh Sarabadani (M.Sc.) reported the use of mouse mesothelium layer by decellularization. This scaffold has been stated by high potentially as a three-dimensional biological scaffold, can play an effective role in improving the development of in vitro follicle culture (19). Zahra Borzouie (M.Sc.) reported the successful results of human testicular-derived cells culture from azoospermic patients on the human serum albumin-based homemade scaffolds (2). According to this study electrospun polyvinyl alcohol human serum albumin gelatin nanofibers, can be satisfactory supported scaffolds for ex vivo growth of human testicular-derived cells (20, 21).

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Conflict of interest

None declared.

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