



Royan Institute Newsletter

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ثبت است بر جریده عالم دوام ما
کاید به جلوه سرو صنوبرخرام ما

Eternal is the one whose heart has awakened to Love
So proud are the tall beauties of the world

هرگز نمیرد آن که دلش زنده شد به عشق
چندان بود کرشمه و ناز سهی قدان

This is how Eternal Records my life define.
Outshines all the others this handsome spruce of mine

► *Hafiz (1320-1389 A.D)*



An Amazing Trip

"... this trip was an excellent way to combine work with pleasure, meeting new colleagues and at the same time gaining some understanding of the culture of your country and region. The tour was exceptionally good, with well-informed and entertaining guides, and excellent organisation. I certainly learned a lot about many different aspects of Iranian life and history, and gained many friends. Persepolis was truly amazing and in beautiful condition. Our trip to mosques, churches, palaces, hotels and shrines was a whirlwind tour, but interspersed with relaxing meals in good company which made it all very enjoyable. All the people we met were friendly, helpful and were often interested in talking to us, either to practise their English or to find out about us and tell us about themselves. The young people especially were full of energy and enthusiasm, and spoke English very well.

With kind regards"

► [Geraldine Hartshorne](#)



► Isfahan, Iran - Sep 2010 ►

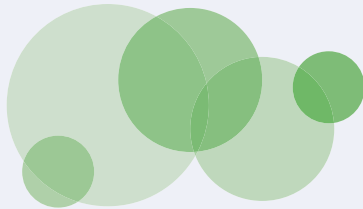
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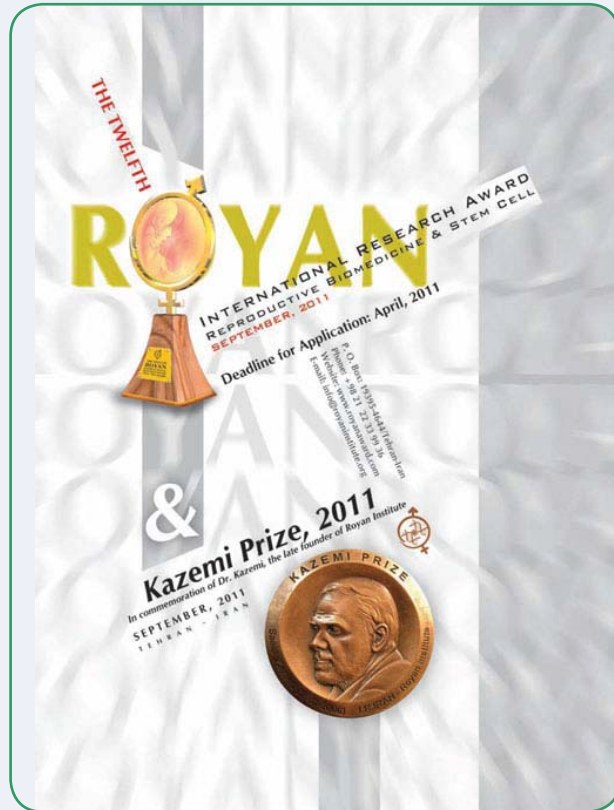
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12th Royan International Research Award on Reproductive Biomedicine & Stem Cells



Sep 2011 - Tehran, IRAN

E-mail: info@royaninstitute.org
Website Address: www.royanaward.com



12th International Congress on Reproductive Biomedicine

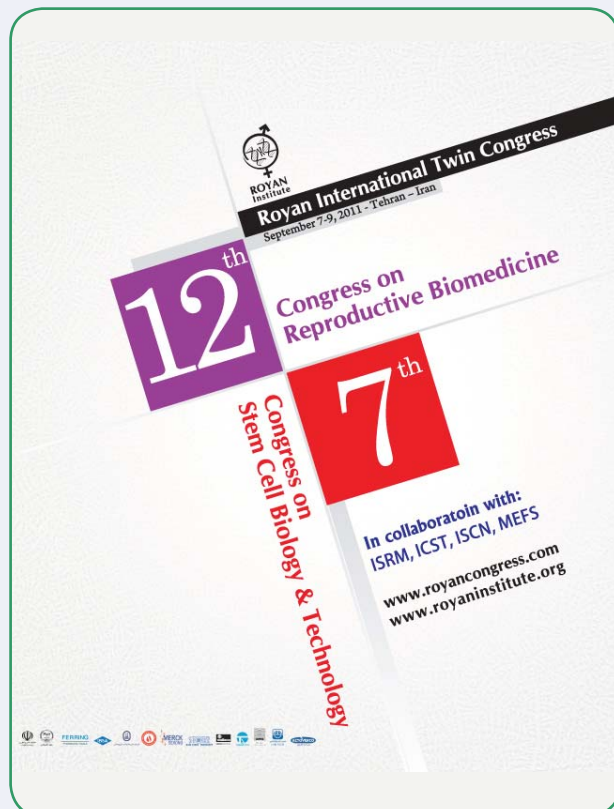
7th Congress on Stem Cell Biology & Technology



Sep. 7-9, 2011 - Tehran , Iran

Deadline for abstract submission: May, 10, 2011

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Royan Articles

► *Stem Cells Dev.* 2011 Feb 24. [Epub ahead of print]

■ Long-Term Maintenance of Undifferentiated Human Embryonic and Induced Pluripotent Stem Cells in Suspension.

Larijani MR, Seifinejad A, Pournasr B, Hajihoseini V, Hassani SN, Totonchi M, Yousefi M, Shamsi F, Salekdeh GH, Baharvand H.

■ 1 Department of Stem Cells and Developmental Biology, Royan Institute for Stem Cell Biology and Technology, The Academic Center for Education, Culture and Research, Tehran, Iran.

Abstract

Traditionally, undifferentiated pluripotent human embryonic and induced pluripotent stem cells (hESCs and hiPSCs) have been expanded as monolayer colonies in adhesion culture, both in the presence or absence of feeder cells. However, the use of pluripotent stem cells poses the need to scale-up current culture methods. Herein, we present the cultivation of 2 hESC lines (Royan H5 and Royan H6) and 2 hiPSC lines (hiPSC1 and hiPSC4) as carrier-free suspension aggregates for an extended period of time. The cells proliferated over multiple passages kept a stable karyotype, which successfully maintained an undifferentiated state and pluripotency, as determined by marker expressions in addition to in vitro spontaneous and directed differentiation. Additionally, these cells can be easily frozen and thawed without losing their proliferation, karyotype stability, and developmental potential. Transcriptome analysis of the 3 lines revealed that the adherent culture condition was nearly identical to the suspension culture in Royan H5 and hiPSC1, but not in Royan H6. It remains unclear whether this observation at the transcript level is biologically significant. In comparison with recent reports, our study presents a low-cost procedure for long-term suspension expansion of hESCs and hiPSCs with the capability of freeze/thawing, karyotype stability, and pluripotency. Our results will pave the way for scaled up expansion and controlled differentiation of hESCs and hiPSCs needed for cell therapy, research, and industrial applications in a bioreactor culture system.

► *Stem Cell Rev.* 2010 Dec;6(4):622-32.

■ Generation of liver disease-specific induced pluripotent stem cells along with efficient differentiation to functional hepatocyte-like cells.

Ghodsizadeh A, Taei A, Totonchi M, Seifinejad A, Gourabi H, Pournasr B, Aghdami N, Malekzadeh R, Almadani N, Salekdeh GH, Baharvand H.

■ Department of Stem Cells and Developmental Biology, Royan Institute for Stem Cell Biology and Technology, ACECR, P.O. Box 19395-4644, Tehran, Iran.

Abstract

The availability of disease-specific induced pluripotent

stem cells (iPSCs) offers a unique opportunity for studying and modeling the effects of specific gene defects on human liver development in vitro and for testing small molecules or other potential therapies for relevant liver disorders. Here we report, for the first time, the derivation of iPSCs by the retroviral transduction of Yamanaka's factors in serum and feeder-free culture conditions from liver-specific patients with tyrosinemia, glycogen storage disease, progressive familial hereditary cholestasis, and two siblings with Crigler-Najjar syndrome. Furthermore, they were differentiated into functional hepatocyte-like cells efficiently. These iPSCs possessed properties of human embryonic stem cells (hESCs) and were successfully differentiated into three lineages that resembled hESC morphology, passaging, surface and pluripotency markers, normal karyotype, DNA methylation, and differentiation. The hepatic lineage-directed differentiation showed that the iPSC-derived hepatic cells expressed hepatocyte-specific markers. Their functionality was confirmed by glycogen and lipid storage activity, secretion of albumin, alpha-fetoprotein, and urea, CYP450 metabolic activity, as well as LDL and indocyanin green uptake. Our results provide proof of principle that human liver-disease specific iPSCs present an exciting potential venue toward cell-based therapeutics, drug metabolism, human liver development and disease models for liver failure disorders.

► *Mol Reprod Dev.* 2010 Oct;77(10):868-75.

■ Sperm status and DNA dose play key roles in sperm/ICSI-mediated gene transfer in caprine.

Shadanloo F, Najafi MH, Hosseini SM, Hajian M, Forouzanfar M, Ghaedi K, Abedi P, Ostadhosseini S, Hosseini L, Eskandari-Nasab MP, Esfahani MH.

■ Department of Reproduction and Development, Royan Institute for Animal Biotechnology, ACECR, Isfahan, Iran.

Abstract

In relation to the growing recent interest in the establishment of sperm-mediated gene transfer (SMGT) technology as a convenient and effective method for the simple production of transgenic animals, in this study the possibility of using SMGT to produce transgenic caprine embryos was investigated for the first time. Buck sperm were directly incubated with different concentrations (0-500 ng) of pcDNA/his/Lac-Z plasmid and used for IVF or ICSI. Sperm used for ICSI were categorized into motile or live-immotile group before being injected into oocytes. In a separate experiment, dead sperm prepared by repeated freezing/thawing were used for DNA-incubation before ICSI. Sham injection was carried out by intracytoplasmic injection of approximately the same volume of media containing different doses of DNA using an ICSI needle. Transgene expression and transmission were detected by X-Gal staining and PCR analysis of developed embryos, respectively. A reasonable blastocyst rate

was observed in all the groups. Only embryos in the sham group were negative for transgene transmission. Transgene expression was completely dependent on the delivery technique and status of sperm, and was only observed in the live-immotile and dead ICSI

groups. The results of this study showed that the technique (IVF vs. ICSI vs. sham injection), sperm status (motile vs. live-immotile vs. dead) and to some extent DNA concentration affect embryo development, transgene transmission and expression.

Science News

Ongoing Pregnancy Rates from Vitrified Eggs as Good as Those from Fresh, Study Shows

► ScienceDaily (Nov. 1, 2010) *Embryos derived from oocytes (eggs) cryopreserved by the vitrification method are just as likely to produce an on-going pregnancy as those involving fresh oocytes, according to a presentation at the 26th annual meeting of the European Society of Human Reproduction and Embryology. Dr. Ana Cobo, Cryobiology Unit director at Institut Universitari -- IVI Valencia, Valencia, Spain, told delegates that the results of her team's research would make egg donation both easier and safer in the future.*

The scientists carried out a randomised clinical trial involving 600 recipients of either freshly-harvested oocytes or those preserved by the vitrification method, where oocytes are flash-frozen after the extraction of water, hence avoiding ice formation. Analysis of the results found that the on-going pregnancy rate in women who had received vitrified oocytes was 43.7% as opposed to 41.7% in the fresh oocyte group. The proportion of top-quality embryos was similar between the two groups, and there was also no difference in age or other demographic characteristics and the incidence of male factor infertility.

"Because we were able to show that there were no differences between the two groups before embryo implantation," said Dr. Cobo, "we can be certain that the on-going pregnancy rates in both groups were not influenced by any factor other than the method of oocyte preservation. Although there has been considerable circumstantial evidence that cryopreservation by the vitrification method produces results as good as those with freshly-harvested oocytes, until this trial there was still a lack of large randomly-controlled studies in the field."

The researchers say that their results will have a significant effect on the practice of egg-banking in the

future. "Many patients will be able to benefit," said Dr. Cobo. "For example, there are cancer patients who will be able to preserve their fertility before undergoing treatment that can make them sterile, patients who would be at risk of ovarian hyperstimulation, and those where a semen sample is not immediately available." Once an egg donor is recruited and screened she undergoes ovarian stimulation to produce a number of oocytes, which are then retrieved. The oocytes then need to be fertilised by the sperm of the male partner of the recipient and the best embryos thus produced are placed in the uterus of the recipient, whose uterine lining has been previously prepared to be ready to receive the embryo.

When using fresh oocytes, the need for synchronisation of all these procedures is paramount, but not always possible. Egg banking precludes the need to synchronise these timings, which can also be the cause of long delays.

"As well as being able to shorten or even eliminate the current long waiting lists, egg banking also offers a safer donation process because it allows oocytes to be quarantined while the absence of any contagious disease in the donor is confirmed," said Dr. Cobo. "Until now we have been unable to do this with any certainty."

The scientists now intend to continue their research by following up the progress of babies born after oocyte vitrification. "We need to ascertain that there are no adverse effects on children conceived from cryopreserved oocytes," said Dr. Cobo, "so we will compare obstetric and neonatal data from babies born after oocyte vitrification with those resulting from the replacement of embryos originating from fresh oocytes. Having made sure that the pregnancies are safe, it is important to ensure that pregnancy outcomes are also free from harm."

<http://www.sciencedaily.com/releases/2010/06/100630071142.htm>

The *Open Anatomy* Journal

ISSN: 1877-6094

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<http://www.bentham.org/open/toanatj/index.htm>

21st

World Congress on Ultrasound in Obstetrics and Gynecology

18-22 September 2011, Los Angeles, USA

Cell Journal (Royan's Journal)

Previous name was "Yakhteh"

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Web site Address: www.celljournal.org
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IJFS

(International Journal of Fertility & Sterility)
(Royan's Journal)

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