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In the Name of
GOD

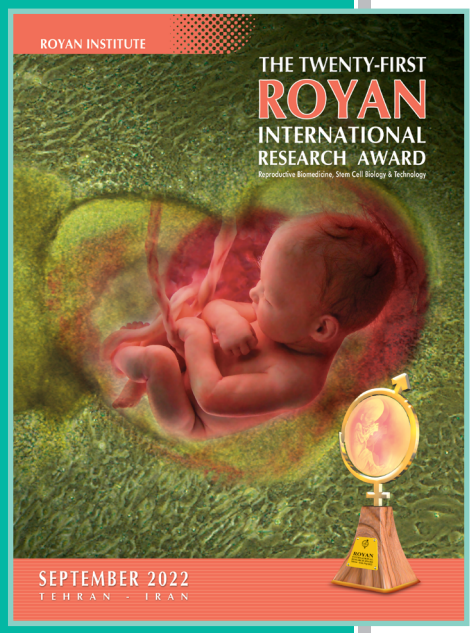
The Twenty-First

# ROYAN

INTERNATIONAL RESEARCH AWARD



**Dr Saeid Kazemi Ashtiani**
The Late Founder of ROYAN Institute

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- Iran National Science Foundation
- Council for Stem Cell Sciences and Technologies
- Industrial Development and Renovation Organization of Iran
- Iran Science Elites Federation
- Iranian Society of Reproductive Medicine
- Islamic Development Bank
- Mustafa Science and Technology Foundation

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# FOREWORD

**Dr Dehghani Firouzabadi**
President of ACECR

Recently, the scientific progress of Iran attracted the attention of researchers from all over the world, specially the region. Since the establishment of Academic Center for Education, Culture and Research (ACECR) in 1980, the ACECR focus was on the science production, application, and the promotion of technology in order to broaden the benefits of ACECR scientific achievements. The various disciplines of medical sciences, engineering, petrochemistry, agriculture, culture and art, have been engaged in ACECR during the last four decades. Its scientific activities in the fields of medicine and biology include reproductive medicine, stem cell biology and technology, cell therapy, regenerative medicine, biotechnology, herbal medicine and cancer biology. So far, the goal has been promotion of science application and improving health services. I am honorable to announce that ACECR aims to become one of the innovation ecosystems for Iranian elites to join.

Royan Institute affiliated to ACECR, is a successful center that has been ranked top at the national and international levels due to its scientific and technological achievements. Besides having efficient and innovative researchers, the fruitful international collaborations in various events; such as international research award and International Twin Congress played a key role in Royan Institute's accomplishments. In this regard, international scientists who have participated at the Royan international events in the past years, introduced Royan in remarkable international journals, while some others published articles about the findings of their joint research projects with Royan researchers. I thank God that after a two-year break in holding this scientific Award due to the special conditions of Covid-19 pandemic, we are holding the 21st Royan International Research Award, and I hope that it provides important opportunities in the fields of reproductive medicine, regenerative medicine, stem cell biology and technology and biotechnology to the human society.

As the president of ACECR, I honor the memory of the late Dr Saeed Kazemi Ashtiani, founder of Royan Institute, who was an elite, innovative director and founder of Royan International Research Award. I appreciate all the international scientists along with colleagues from Iran and Royan Institute who have cooperated in evaluating the selected candidates of this scientific event. I am particularly grateful to the board of directors and the scientific committee of Royan Institute for their continuous efforts in organizing the research award. Lastly, I would like to congratulate the selected researchers of Royan International Research Award. I hope we can continue this scientific event in the coming years.

# INTRODUCTION

**Dr Shahverdi**
Award Chairman and Royan Institute President



By the grace of God and the efforts of Royan's dedicated colleagues, I am honored to the successful holding of the 21st Royan International Research Award this year. Despite restrictions caused by the COVID-19 outbreak, the scientific and executive committee of Royan Award were determined to hold the Award face to face at national level, for which I am grateful. And of course, at the international level, I appreciate the virtual presence of elites, candidates and guests from other countries in accompanying this scientific event.

The scientific community learnt a lot from Covid-19. Scientists shattered borders and created a united society for global collaboration. Meanwhile, virtual and online space became more pervasive in everyday life. So scientific meetings, presentation of new ideas, interaction of researchers and experts and the rapid sharing of knowledge at the national and international level, especially virtually and in person doubled the speed of science dissemination and its dynamics.

Biologists and medical science colleagues contributed the most to the treatment of Covid-19. I am thankful that Royan's researchers also took effective steps by sharing their scientific findings with the scientific community at international level to help curing the disease. The molecular and cellular experiences of our colleagues were well used both in the diagnosis of the disease and in the preparation of vaccines and treatments. International achievements are illustrative too and confirmed well that they are mainly achieved by individuals, companies or organizations with an effective scientific background in related fields.

We should learn from this experience to invest fully in basic sciences and clinical trials. We must train human resources, create and complete infrastructures in order to cope with problems more deliberately in the future. Moreover, we will be able to reduce society's pain and offer a helping hand to those in need at appropriate time and finally win the hearts and minds of people and society.

Once again, I really appreciate the guests and companions of this scientific program and thank the executive committee for the incredible support they have provided. Hoping for Covid19-free days and seeing you in person at next international and national events.



# ROYAN **AWARDS**




Royan International Research Award (RIRA) was founded by the late director of Royan Institute, Dr Saeid Kazemi Ashtiani with the aim of encouraging researchers, appreciating their efforts and preparing a friendly scientific atmosphere for them to exchange their knowledge and experiences. Kazemi had wonderful ideas to bring researchers together and motivate them to increase their efforts and perform high level researches via this research award. Royan's staff lost their beloved director in January 2006 by heart attack, May he rest in peace.

This annual award is extending into a higher quality event every year, increasing the scientific level and number of the submitted papers. The research papers are evaluated through an intense jury procedure by Award's national and international Jury board to whom our special thanks goes. Each year the prominent researches with outstanding help in solving problems in reproduction and stem cell fields, are announced, appreciated and rewarded.

As comparing the researches in different fields is very difficult and finding the best researches with variations in methods, implements and results is almost impossible, from the eighth RIRA the same prizes are distributed among winners in different fields of reproductive biomedicine and stem cell such as: female infertility, ethics, andrology, embryology, reproductive imaging, reproductive genetics, stem cell biology and technology, regenerative medicine, and biotechnology.

## Nomination and Selection Procedure of Award

In the first 20 RIRAs, the guidelines for candidate selection procedure were based on the submitted research articles. After two years of covid-19 pandemic, the RIRA scientific committee has decided to nominate the young principal investigators who work on multidisciplinary topics according to their recent publications and scientific history.

After the nominees are introduced by the scientific groups, the national and international referees make the jury process by evaluating their scientific history and recent publications, qualitatively in Likert scale according to these norms:

- Relevancy to the award subjects
- Creativity and innovation
- Methodology and research design
- Problem solving
- Applicability on human

Evaluation of the nominees by the juries is discussed in the board of juries and their decisions get approved by scientific board of the institute. Finally, international and national winners are selected and invited to present their researches in Royan twin congress on Reproductive Biomedicine and Stem Cell Biology and Technology which is held almost in August/September every year and receive their prizes in prize award ceremony.



Note: It is obligatory for the winners to attend the ceremony and present their research articles in the congress.

**NATIONAL WINNER**

**Stem Cell Biology and Technology**



2022

**Mehdi Jaymand, PhD**

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Iran

Dr Mehdi Jaymand is an assistant professor at Kermanshah University of Medical Sciences (KUMS). He got his BSc and MSc degrees in Chemistry in 2008 and 2010, respectively, both from Tabriz Payame Noor University. In 2017, he completed his PhD in Pharmaceutical Biotechnology in Tabriz University of Medical Sciences. He joined as an assistant professor to the KUMS at the late of 2018. In 2013. Dr Jaymand has selected as Young Researcher in Razi Festival.

His research interests are focused on bioengineering (e.g., regenerative medicine and nanomedicine). In recent years, he and his coworkers focused on design and development of electrically conductive scaffolding biomaterials based on conductive polymers for tissue engineering application, especially in the case of electrically excitable cells such as fibroblast, osteoblast, and neural. He has published more than 160 articles in peer-reviewed scientific journals, which have been cited 3089 times by 2042 documents; consequently his h-index is 29.

## Electrically Conductive Scaffolds for Tissue Engineering: Advantages, Challenges, and Perspectives

**OBJECTIVE:**

Tissue and organ failure is one of the most important health problems. The most common clinical treatment approaches are surgical repair, artificial prostheses, drug therapy, mechanical devices, and transplantation. Nevertheless, the regeneration of damaged tissue/organ are not satisfactory in all cases. Tissue engineering (TE) has been developed as a powerful alternative for these treatments. TE combines materials engineering and molecular biology to develop biological substitutes consisting signaling molecules, living cells, and scaffolds for regeneration of damaged tissues/organs. Amongst, the scaffold provide physicochemical cues for living cells and has an important role in their missions. In addition, electrical conductivity of scaffold has inherent role in some biological functions (e.g., cell adhesion, cell migration, cell differentiation, and DNA synthesis).
These biomaterials are divided into conductive polymers (CPs)-based and conductive nanomaterials-based scaffolds. The most exploited nanomaterials are carbon- and gold-based nano-materials. However, the main problems of this strategy are non-biodegradability and inflammatory reactions of fillers in vivo. CPs such as PANI, PPy, and PTh can be considered as potential candidates for this purpose owing to their superior physicochemical properties and acceptable in vitro and in vivo cyto- and bio-compatibilities. Nevertheless, elongated in vivo degradation time of these polymers may result in inflammation and requirement of surgical removal. To overcome such problem, modification of CPs with natural and synthetic biodegradable and biocompatible polymers through grafting or blending processes has suggested as efficient approach.

**MATERIALS AND METHODS:**

As above discussed facts, in recent years, we have focused on design and development of electrically conductive scaffolding polymeric biomaterials through modification of PANI, PPy and PTh with natural and synthetic biodegradable and biocompatible polymers. In this regard, some electrically conductive scaffolds with these biomaterials in electrospun nanofibers and hydrogel forms were fabricated in our laboratory. The physicochemical (e.g., morphology, hydrophilicity, swelling, conductivity, and electroactivity) as well as biological (biodegradation, cyto- and hemo-compatibility, and improve the cells adhesion and proliferation) properties of the fabricated scaffolds were investigated.

**RESULTS:**

It was found that the developed electrically conductive scaffolds through the grafting of PANI, PPy and PTh onto aliphatic polyester, gelatin, chitosan, polydopamine, polylactide, poly(2-hydroxy ethylmathacrylate) and poly(ethylene glycol) exhibited acceptable electrical conductivities and electeroactivities. In most cases, the fabricated scaffolds showed excellent in vitro biodegradation rate that assessed by both gravimetric approach and SEM imaging. In comparison with polystyrene plate (as control) the developed scaffolds displayed better cells adhesion and proliferation performance. The hemolysis assay approved the hemocompatibilities of the developed scaffolding biomaterials, and in the most cases the hemolysis rate were less than 3% even at relatively high concentration.

**CONCLUSION:**

Physicochemical as well as biological analysis approved the potential of developed electrically conductive scaffolds for various TE, especially in the case of electrically excitable cells (e.g., fibroblast, osteoblast, and neural) owing to importance effect of electrical conductivity on cell's adhesion, migration and differentiation, as well as DNA synthesis and protein secretion. However, it is extremely important to optimize the composition of conductive scaffolding biomaterials based on the cytotoxicity threshold.

**KEYWORDS:**

Conductive polymers, Modification, Electrically conductive scaffolds, Tissue engineering

## NATIONAL WINNER

**Stem Cell Biology and Technology**



2022

**Iman Shabani, PhD**
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Iran

Dr Iman Shabani is an assistant professor at Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran. He received his BSc, MSc and PhD degrees in Polymer Engineering in 2007, 2009 and 2013 respectively, all from Amirkabir University of Technology. He joined as an assistant professor to Amirkabir Univ. Tech. in 2014. He has supervised more than 50 graduate and undergraduate completed theses.

In 2016, he received Iran National Elite Foundation award, Dr. Kazemi Ashtiani Research Grant for Young Assistant Professors. In 2013 he won the second place in Young Researcher Award, Advanced Technologies Committee, 17th Razi Research Festival on Medical Sciences. Dr Shabani gained the second place of Applied Research Award, 14th Khwarizmi Youth Award in 2012. He has published more than 45 papers in various scientific journals which have been cited 1596 times by 1346 documents; consequently his h-index is 24.

# Development of Bioactive Dopants to Design PANI-Based Conductive Scaffolds for Tissue Engineering Applications

**BACKGROUND:**

Electroactive scaffolds provide a direct method for delivering various forms of electrical stimulation to cells. Conductive Polyaniline (PANI)-based scaffolds have long been discussed for tissue engineering applications, but the challenges of the biocompatibility of PANI are not something that can be easily ignored. In our recent studies, it was shown that most of the cytotoxic effects of PANI are related to its cytotoxic dopants and the goal has been to improve the biocompatibility of PANI by using bioactive dopants. The choice of dopant for fabrication of PANI-based scaffolds can be tailored to the target tissue. In current research, taurine, ascorbic acid, and brilliant blue have been used to design scaffolds for nerve, bone, and skin tissue engineering, respectively. In fact, the biomolecules used in these scaffolds cause doping of PANI and regulate cellular behaviors.

**MATERIALS AND METHODS:**

Conductive PANI-based nanofibers were fabricated through electrospinning. Poly(L-lactide) and Polyethersulfone were used as the carriers of PANI. Taurine (Tau), ascorbic acid (AA), and brilliant blue (BB) were used as the bioactive dopants and compared with camphorsulfonic acid (the main but cytotoxic dopant of PANI). By adjusting the electrospinning parameters, the desirable nanofibrous structures were fabricated. Physicochemical, electrical, topographical, drug (dopant) release, and biocompatibility of the designed scaffolds were characterized by different methods.

**RESULTS:**

It was shown that the type of dopant affects all the characteristics of PANI-based scaffolds. Morphology, conductivity, hydrophilicity-hydrophobicity, and the interaction of cells with the scaffold are affected by the dopant. Dopant with higher acidity gives more conductivity to PANI (BB) and smaller dopant has a faster release from the scaffold (Tau). Tau is one of the most abundant amino acids in the nervous system and improves the proliferation and neural differentiation of stem cells. BB has antibacterial properties and acts as wound dressing and causes skin regeneration. AA is a vitamin that has a significant effect on the proliferation and bone differentiation of stem cells.

**CONCLUSION:**

In the complex microenvironment, cells receive all sorts of active signals that are biochemical, structural, electrical, and mechanical stimuli. Conductive PANI-based nanofibers designed with specialized dopants for the intended applications can act as multifunctional scaffolds and provide the transmission of all vital signals to the cells.

**KEYWORDS:**

Polyaniline, Conductive scaffold, Tissue Engineering, Dopant, Stem cells

## NATIONAL WINNER

**Reproductive Biomedicine**



2022

**Marziyeh Tavalaee, PhD**

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Iran

Dr Marziyeh Tavalaee is an associate professor of biology at Royan Institute. She completed her PhD in Developmental Biology in 2016. She has published more than 52 national articles, 121 international articles, 10 national books and 5 chapters of international books. She has supervised more than 102 research projects.

Scientometric analysis in the field of Andrology by an American group introduced her as the seventh of the top ten scientists in the world who investigated the role of sperm DNA damage in male infertility in 2019. Dr Tavalaee was selected as the top researcher in the field of medical sciences (ACECR) in 2019. She was announced as a top faculty member of ACECR in 2016 and introduced as a top researcher in the first international ISERB Award in 2015. Her research interests are focused on male infertility including sperm function tests, novel and routine sperm selection procedures, etiology of varicocele, ⋯. She has published more than 115 international papers in various scientific journals, which have been cited 1951 times by 1117 documents; consecutively her h-index is 25.

# Could Artificial Oocyte Activation Following ICSI Improve Fertilization and Pregnancy in Couples with Male Factor Infertility

**OBJECTIVE:**

The intracytoplasmic sperm injection (ICSI) has been capable of significantly improving male factor infertility, but fertilization failure after ICSI still occure in 1–5%, and the primary reason for this failure is a lack of oocyte activation. For these cases, artificial oocyte activation (AOA) by a chemical agent or an electrical pulse following ICSI is recommended. In most fertility centers, this procedure is performed for couples with previous failed fertilization and/or severe teratozoospermia like globozoospermia. Therefore, this presentation aims to report the clinical results of the ICSI-AOA technique, and the status of the health of children born through this procedure.

**METHODS:**

This presentation covers the clinical outcomes of the ICSI-AOA technique and the health of children through meta-analysis, clinical trials, and case report studies during a period of recent 15 years. It also covers fifteen of our published papers regarding ICSI-AOA.

**RESULTS:**

According to background literature and our results, couples with previous failed fertilization and/or severe teratozoospermia and/or globozoospermic men may benefit from ICSI-AOA in terms of fertilization, which in turn, may improve the implantation and pregnancy rates. However existing conflicts in the literature on the effect of AOA on fertilization rate may have resulted from case selection, limited sample number, and type of agent used to induce AOA. Therefore, to resolve these ambiguities, prospective, randomized clinical trials are needed. Regarding the health of children born through this technique, it has been reported that the health of these children is likely not jeopardized by this technique. Interestingly, recent clinical studies suggest that the normal ICSI cycle may also benefit from this technique and molecular analysis has shown that the molecular signature of ICSI-AOA is close to IVF-derived embryos as compared with those of ICSI to IVF.

**CONCLUSION:**

ICSI-AOA could restore the fertilization rate, and pregnancy rate in couples with previous failed fertilization and/or severe teratozoospermia and/or globozoospermic men.

**KEYWORDS:**

ICSI-AOA, Fertilization, Pregnancy, Globozoospermia, Teratozoospermia



ROYAN Institute

# SELECTED IRANIAN SCIENTISTS

## Reproductive Biomedicine



2022

**Ali Honaramooz, DVM, PhD**
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Canada

Dr Ali Honaramooz obtained a DVM in veterinary medicine (1983-89, Shiraz University), a PhD in reproductive endocrinology (1994-99, University of Saskatchewan), and post-doctoral training in reproductive technologies (1999-2004, University of Pennsylvania). For the past 30 years Dr Honaramooz has been involved in teaching and research in the areas of reproduction and biomedical sciences. Since 2004, he has been a faculty at the University of Saskatchewan where he is currently a full professor of veterinary biomedical sciences. His research interests are in reproductive biology and technology, with emphasis on the study and manipulation of spermatogenesis and spermatogonial stem cells. He and colleagues were the first to develop and apply the technique for germ cell (spermatogonial) transplantation in farm animals, a procedure in which testis cells are harvested from a fertile donor male and microinjected into the seminiferous tubules of an infertile recipient. They have also established the novel technique of testis tissue xenografting, a model system that allows the progression of spermatogenesis from a variety of mammalian species in a laboratory mouse. With 71 documents and 3229 citations; cited by 1515 documents, his h-index is 29.

### The Application of Animal Models in Preservation of Male Fertility

## Stem Cell Biology and Technology



2022

**Omid Mashinchian, PhD**
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Switzerland

Dr Omid Mashinchian is a team leader & specialist of precision regenerative medicine at Nestlé R&D, Nestle Institute of Health Sciences, Switzerland. He got his Master degree in Medical Nanotechnology (Nanomedicine) from Tehran University of Medical Sciences, Iran in 2014. He obtained his PhD in Biotechnology&Bioengineering from Nestle Institute of Health Sciences/Swiss Federal Institute of Technology (EPFL), Switzerland in 2019. With 27 documents and 841 citations; cited by 769 documents, his h-index is 14.

### An Engineered Multicellular Stem Cell Niche for Studying Disease, Aging and Regeneration

# Previous Awards

## The First

## ROYAN

### International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



1




**September 2000**

Received Papers: 72

**International Winners:**

- First Place: **Mohamed Mitwally,** Canada
  Comparison of an Aromatase Inhibitor with Clomiphene Citrate for Induction of Ovulation
- Second Place: **Ali Ahmady,** Canada
  Cell and Molecular Investigation of the Fertilizing Ability of Dead Sperm
- Third Place: **Weihau Wang,** USA
  Spindle Observation in Living Human Eggs with Pollaries Microscope and Its Use in Assisted Human Reproduction
- Fourth Place: **Simon Marina Avendano,** Spain
  HIV-Seropositive Can Be Fathers without Infecting the Women or Child
- Fifth Place: **Jaffar Ali,** Qatar
  Formulation of a Protein-Free Medium for Human Assisted Reproduction

**Iranian Winners:**

- **Mohammad Hossein Nasr-Esfahani**
  Sperm Chromatin Status and Male Infertility
- **Mahnaz Ashrafi**
  Effect of Metformin on Ovulation and Pregnancy Ratein Women with Clomiphen Resistant PCOS
- **Mohammad Ebrahim Parsanezhad**
  Section of the Cervical Septum Doesn't Impair Reproductive Outcome

## The Second

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



2




September 2001

Received Papers: 78



### International Winners:

- First Place: **Ri-Cheng Chian,** Canada
  A New Treatment for Women with Infertility Due to Polycystic Ovarian Syndrome: Immature Oocyte Retrieval Followed *in vitro* Maturation

- Second Place: **Ma'asouma Makhseed,** Kuwait
  The Possible Immunological Basis of Repeated Pregnancy Loss

- Third Place: **Esmail Behboodi,** USA
  Production of Goats by Somatic Cell Nuclear Transfer

- Fourth Place: **Sayeed Unisa,** India
  Reproductive, Demographic and Behavioral Causes of Infertility in India

- Fifth Place: **Ahmed Mohammed Saleh,** Saudi Arabia
  Effect of Laparoscopic Ovarian Drilling on Serum Vascular Endothelial Growth Factor (VEGF), and on Insulin Response to Oral Glucose Tolerance Test in Women with PCOS

### Iranian Winners:

- **Hossein Baharvand**
  Improvement of Blastocyst Development *in vitro* and Overcoming the Blastocyst Collapse and Its Effective Factor(s) in Sequential Culture Media

- **Marzieh Nojomi**
  Epidemiology of Infertility in the West of Tehran 2000-2001

- **Gholamreza Pourmand**
  Effect of Renal Transplantation on Sperm Quality and Sex Hormones Level

## The Third

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



3




September 2002

Received Papers: 212

### International Winners:

- First Place: **Marco Filicori,** Italy
  Novel Approaches to Ovulation Induction: The Critical Role of Luteinizing Hormone Activity in Regulating Folliculogenesis

- Second Place: **Klaus G. Steger,** Canada
  Influence of Histone-Protmine-Exchange on Male Infertility

- Third Place: **Franck Pellestor,** France
  Chromosomal Investigations in Human Gametes: Study of the Interchromosomal Effect in Sperm of Chromosomal Rearrangement Carriers and Mechanisms of Non Disjunction in Oocytes

- Fourth Place: **Ghazala S. Basir,** Hong Kong
  The Effect of High Estradiol Levels on Endometrial Development in Assisted Reproduction Technology: Evaluation of Sonographic Doppler Haemodynamic and Morphometric Parameters

- Fifth Place: **Mohamed Ali Bedaiwy,** USA
  Transplantation of Intact Frozen-Thawed Mammalian Ovary with Vascular Anastomosis: A Novel Approach

### Iranian Winners:

- **Saeed Alborzi**
  Laparoscopic Salpingoovolysis. Is There Any Place for Second Look Laparoscopy?

- **Saeed Rahbar**
  Laser Assisted Hatching in Young Women Significantly Increases Pregnancy and Implantation Rates

- **Shir Ahmad Sarani**
  Morphological Evidence for the Implantation Window in Human Luminal Endometrium
  Special Winner in Reproductive Health

### Special Winner:

- **V. I. Sodestrom- Anttila,** Finland
  Embryo Donation-Outcome & Attitude Among Embryo Donors & Recipient



ROYAN Institute

## The Fourth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology




4




September 2003

Received Papers: 222



### International Winners:

- First Place: **Yong-Mahn Han,** South Korea
  Abnormal Structural Integrity and Reprogramming in the Cloned Embryos
- Second Place: **Lucille E. Voullaire,** Australia
  Chromosome Abnormality In Human Embryos Diagnosed Using Comparative Genomic Hybridization: Its Relationship to Infertility
- Third Place: **Mauro Maccarrone,** Italy
  Low Fatty Acid Amide Hyrolase and Anandamide Levels Are Associated with Failure to Achieve an Ongoing Pregnancy after IVF and Embryo Transfer
- Fourth Place: **Ali Honaramooz,** USA
  Sperm from Neonatal Mammalian Testes Grafted in Mice
- Fifth Place: **Jan M.R. Gerris,** Belgium
  Elective Single Embryo Transfer Halves the Twinning Rate without Decrease in the Total Ongoing Pregnancy Rate of an AVF/ICSI Program

### Iranian Winners:

- **Mohammad Ebrahim Parsanezhad**
  Ovarian Stromal Blood Flow Changes After Laparoscopic Ovarian Cauterization in Women with Polycystic Ovary Syndrome
- **Mojdeh Salehnia**
  Vitrification of Ovarian Tissue
- **Jaleh Zolghadri**
  Successful Pregnancy Outcome with IUI in Patients with Unexplained Recurrent Miscarriage, Whose Male Partners Have Low Score Hypo-Osmotic Swelling Test

## The Fifth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



5




September 2004

Received Papers: 199

### International Winners:

- Second Place: **Alfonso Guiterrez-Adan,** Spain
  Long Term Effect of *in vitro* Culture of Mouse Embryos with Serum on mRNA Expression of Imprinting Genes, Development and Behavior

- Second Place: **Maciej K. Kurpisz,** Poland
  Reactive Oxygen Species and "Male Factor" of Infertility

- Third Place: **Michel von Wolf,** Germany
  Glucose Transporter Proteins (GLUT) in Human Endometrial-Expression, Regulation and Function through out the Menstrual Cycle and in Early Pregnancy

- Fourth Place: **Sophie Lambard,** France
  Human Male Gamete Quality: Place of Aromatase and Estrogens

- Fifth Place: **Naojiro Minami,** Japan
  A Novel Maternal Effect Gene, Oogenesin: Involvement in Zygotic Gene Activation and Early Embryonic Development in the Mouse

### Iranian Winners:

- **Seyed Javad Mowla**
  Catsper Gene Expression in Postnatal Development of Mouse Testis and in Subfertile Men with Deficient Sperm Motility

- **Mohammad A. Khalili**
  Restoration of Spermatogenesis by Adenoviral Gene Transfer into Injured Spinal Cords of Rats

- **Mojdeh Salehnia**
  Ultrastructural, Histochemical and Morphometric Studies of Mouse Reproductive Tract after Ovarian Induction



ROYAN Institute

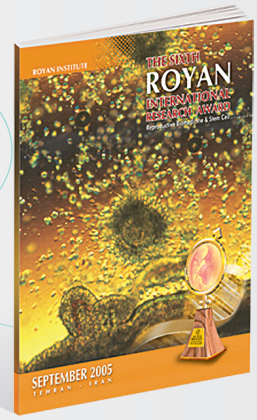
## The Sixth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology






6

September 2005

Received Papers: 198

### International Winners:

- First Place: **Kathyjo Ann Jackson,** USA
  Therapeutic potential of stem cells

- Second Place: **Carmen Belen Martinez-Madrid,** Belgium
  Ficoll Density Gradient Method for Recovery of Isolated Human Ovarian Primordial Follicles

- Third Place: **Federico Alejandra Calegari,** Germany
  Tissue-Specific Manipulating of Gene Expression of Mouse Embryos Using in Utero Electroporation

- Fourth Place: **Maryam Kabir-salmani,** Japan
  Different Roles of $\alpha_5\beta_1$ and $\alpha_v\beta_3$ Integrins in the IGF-I-Induced Migration of the Human Extravillous Trophoblast Cells

- Fifth Place: **Zhenmin Lei,** USA
  Testicular Phenotype in Luteinizing Hormone Knockout Animals and the Effect of Testostrone Replacement Therapy

### Iranian Winners:

- **Seyed Javad Mowla**
  The Profile of Gene Expression Changes During the Neural Differentiation of Bone Marrow Stormal Cells (BMSCs)

- **Jaleh Zolghadri**
  Pregnancy Outcome Following Laparoscopic Tubal Ligation of Hydrosalpinx Tube in Patients with Early Recurrent Abortion

## The Seventh

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



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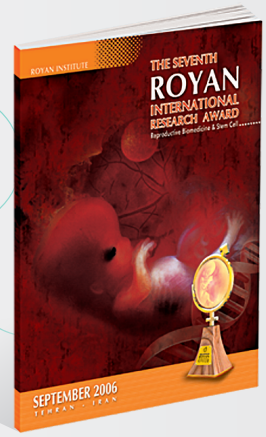



September 2006

Received Papers: 221

### International Winners:

- First Place: **James Affram Adjaye,** Germany
  A) Whole-Genome Approaches for Large-Scale Gene Identification and Expression Analysis in Mammalian Preimplantation Embryos & B) Primary Differentiation in the Human Blastocyst: Comparative Molecular Portraits of Inner Cell Mass and Trophectoderm Cells

- Second Place: **Tian-hua Huang,** China
  Detection and Expression of Hepatitis B Virus X Gene in One and Two-Cell Embryos from Golden Hamster Oocytes *in vitro* Fertilized with Human Spermatozoa Carrying HBV DNA

- Third Place: **Adrian Richard Eley,** UK
  Opoptosis of Ejaculated Human Sperm Is Induced by Co-Incubation with Chlamydia Trachomatis Lipopolysaccaride

- Fourth Place: **Lone Schmidt,** Denmark
  Does Infertility Cause Marital Benefit? An Epidemiological Study of 2250 Women and Men in Fertility Treatment

- Fifth Place: **Louis Chukwuemeka Ajonuma,** Hong Kong
  Molecular and Cellular Mechanisms Underlying Abnormal Fluid Formation in the Female Reproductive Tract: The Critical Role of Cystic Fibrosis Transmembrane Conductance Regulators

### Iranian Winners:

- **Mohammadreza Baghban Eslaminejad**
  Polarized Culture Systems and Their Effects on Embryo Development

- **Mansoureh Movahedin**
  New Approaches to Assess the Success and Enhance the Efficiency of Male Germ Cell Transplantation in the Mouse

- **Ashraf Alleyassin**
  Comparison of Unilateral and Bilateral Transfer of Injected Oocytes into Fallopian Tubes: A Prospective Randomized Clinical Trial

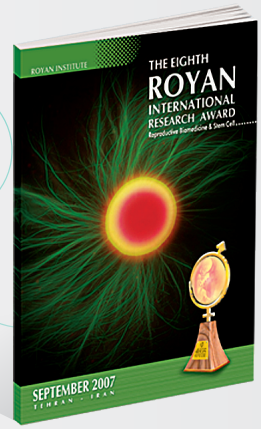


ROYAN Institute

# The Eighth ROYAN International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



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September 2007

Received Papers: 248

## International Winners:

Best research project in stem cell field

- **Chiba Shigeru,** Japan
  Role of Notch Signaling in Normal and Neoplastic Hematopoietic Stem Cells and Clinical Application of Notch Signal Modifiers

Best research project in reproductive genetic field

- **Françoise Dantzer,** France
  Poly (ADP-Ribose) Polymerase-2 Contributes to the Fidelity of Male Meiosis I and Spermiogenesis

Best research project in female infertility field

- **Seyed Mohammad Moazzeni,** Iran
  Dendritic Cells and Pregnancy: A Bidirectional Relationship to Protect the Semiallogenic Fetus

Best research project in embryology field

- **Bjorn Johannes Oback,** New Zealand
  Nuclear Donor Choice, Sperm Mediated Activation and Embryo Aggregation: A Multi-Pronged Approach to Sequentially Improve Cattle Cloning Efficacy

Best research project in andrology field

- **Reddanna Pallu,** India
  Role of Cyclooxygenases in Male Reproduction

## Iranian Winners:

- **Ramin Radpour**
  Novel Mutations and (TG)M(T)N Polymorphism in Iranian Males with Congenital Bilateral Absence of the Vas Deferens

- **Mohammad Ebrahim Parsanezhad**
  Hysteroscopic Metroplasty of the Complete Uterine Septum, Duplicate Cervix, and Vaginal Septum

- **Mehri Azadbakht**
  Apoptosis in Mouse Embryos Co-Cultured with Polarized or Non-Polarized Uterine Epithelial Cells Using Sequential Culture Media

## The Ninth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



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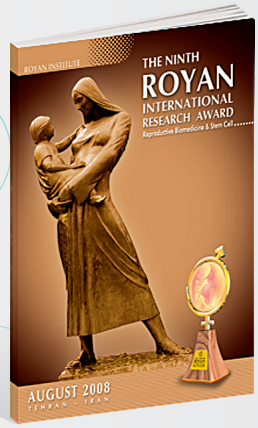


September 2008

Received Papers: 202

### International Winners:

Best research project in stem cell field

- **Su-Chun Zhang,** USA
  Human Embryonic Stem Cells As a Tool of Discovery

Best research project in reproductive genetic field

- **Smita Mahale,** India
  Structural, Functional and Molecular Aspects of Follicle Stimulating Hormone Receptor: Applications in Designing Receptor Targets and Management of Female Infertility

Best research projects in female infertility field (share)

- **Federico Prefumo,** Italy
  Uterine Doppler Investigations and Trophoblast Biology in Early Pregnancy

- **Saeed Alborzi,** Iran
  Laparoscopic Metroplasty in Bicornuate and Didelphic Uterus

Best research project in embryology field

- **Leen.Vanhoutte,** Belgium
  Nuclear and Cytoplasmic Maturation of *in vitro* Matured Human Oocytes After Temporary Nuclear Arrest by Phosphodiesterase 3-Inhibitor

Best research project in andrology field

- **T.O.Ogata,** Japan
  Haplotype Analysis of the Estrogen Receptor Alpha Gene in Male Genital and Reproductive Abnormalities

### Iranian Winners:

- **Ali Fathi**
  The Molecular Mechanisms Controlling Embryonic Stem Cells (Escs) Proliferation and Differentiation

- **Fardin Fathi**
  Characterizing Endothelial Cells Derived from the Murine Embryonic Stem Cell Line CCE



ROYAN Institute

## The Tenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology




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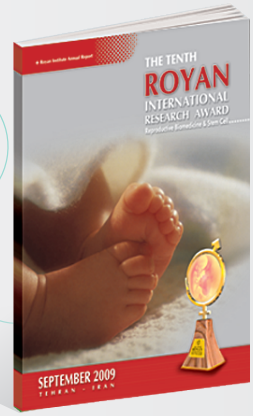


September 2009

Received Papers: 253

### International Winners:

Best research project in stem cell field

- **Yi Liu,** China
  Dental Stem Cells-Based Tissue Regeneration in a Large Animal Model

Best research project in reproductive genetic field

- **Wai-sum OO,** China
  Adrenomedullin in Male and Female Reproduction

Best research projects in female infertility field (share)

- **Sherman Silber,** USA
  A Series of Monozygotic Twins Discordant for Ovarian Failure: Ovary Transplantation (Cortical versus Microvascular) and Cryopreservation

- **Melinda Halasz ,** Hungary
  What Harbours the Cradle of Life? The Progesterone-Dependent Immunomodulation

Best research project in embryology field

- **Geetanjali Sachdeva,** India
  Molecular Assessment of the Uterine Milieu during Implantation Window in Humans and Non-human Primates

Best research project in andrology field

- **Paolo Chieffi,** Italy
  PATZ1 Gene Has a Critical Role in the Spermatogenesis and Testicular Tumours

### Iranian Winners:

- **Hossein Mozdarani**
  Reduction of Induced Transgenerational Genomic Instability in Gametes Using Vitamins E and C, Observed As Chromosomal Aneuploidy and Micronuclei in Preimplantation Embryos

- **Seyed Javad Mowla**
  OCT4 Spliced Variants Are Differentially Expressed in Human Pluripotent and Nonpluripotent Cells

- **Mohammad Reza Safarinejad**
  Evidence Based Medicine on the Pharmacologic Management of Premature Ejaculation

## The Eleventh

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology




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September 2010

Received Papers: 358

### International Winners:

Best research project in regenerative medicine field

- **Stefano Pluchino,** Italy
  Human Neural Stem Cells Ameliorate Autoimmune Encephalomyelitis in Non-human Primates

Best research project in stem cell biology & technology field

- **Hooman Sadri-Ardekani,** Iran-The Netherlands
  Propagation of Human Spermatogonial Stem Cells *in vitro*

Best research project in female infertility field

- **Louis Chukwuemeka Ajonuma,** Nigeria
  New Insights into the Mechanisms Underlying Chlamydia Trachomatis Infection Induced Female Infertility

Best research project in reproductive genetic field

- **Anu Bashamboo,** France
  Mutations in NR5A1 Associated with Ovarian Insufficiency

Best research project in embryology field

- **Mohammad Hossein Nasr-Esfahani,** Iran
  New Era in Sperm Selection for ICSI Procedure

### Iranian Winners:

- **Serajoddin Vahidi**
  Prevalence of Primary Infertility in the Islamic Republic of Iran in 2004-2005

- **Tahereh Ma'dani**
  Improvement of Pregnancy Rate in ART Cycles

- **Mehrdad Noruzinia**
  MTHFR Promoter Hypermethylation in Testicular Biopsies of Patients with Non-obstructive Azoospermia: The Role of Epigenetics in Male Infertility

- **Abbas Piryaei**
  Differentiation Capability of Mouse Bone Marrow-Derived Mesenchymal Stem Cells into Hepatocyte-Like Cells on Artificial Basement Membrane Containing Ultraweb Nanofibers and Their Transplantation into Carbon Tetrachloride Injured Liver Model

## The Twelfth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology




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September 2011

Received Papers: 280

### International Winners:

Best research project in regenerative medicine field

- **Lorenzo Piemonti,** Italy
  Bone Marrow as Ideal Microenvironment for Human Islet Transplantation to Treat Type 1 Diabetes (ClinicalTrials.gov Identifier: NCT01345227)

Best research project in stem cell biology & technology field

- **Hiromitsu Nakauchi,** Japan
  Heterogeneity and Hierarchy Within the Most Primitive Hematopoietic Stem Cell Compartment

Best research project in female infertility field

- **Elizabeth Stewart,** USA
  Safely Extending Focused Ultrasound Surgery for Uterine Leiomyomas to Women Who Desire Future Pregnancies

Best research project in reproductive genetic field

- **Paul Thomas,** Australia
  Identification of SOX3 As an XX Male Sex Reversal Gene in Mice and Humans

Best research project in embryology field

- **Steve Tardif,** UK
  Infertility with Impaired Zona Pellucida Adhesion of Spermatozoa from Mice Lacking TauCstF-64

Best research project in epidemiology & ethics fields

- **Heping Zhang,** USA
  Decision Trees for Identifying Predictors of Treatment Effectiveness in Clinical Trials and Its Application to Ovulation in a Study of Women with Polycystic Ovary Syndrome

### Iranian Winners:

- **Morteza S. Hosseini**
  Development of an Optimized Zona-Free Method of Somatic Cell Nuclear Transfer in the Goat

- **Jaleh Zolghadri**
  Relationship Between Abnormal Glucose Tolerance Test and History of Previous Recurrent Miscarriages, and Beneficial Effect of Metformin in These Patients: A Prospective Clinical Study

- **Batool Rashidi**
  Simvastatin Effects on Androgens, Inflammatory Mediators, and Endogenous Pituitary Gonadotropins Among Patients with PCOS Undergoing IVF: Results from a Prospective Randomized Placebo-Controlled Clinical Trial

## The Thirteenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology






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September 2012

Received Papers: 169

### International Winners:

Best research project in stem cell biology & technology field

- **Chengcheng (Alec) Zhang,** USA
  *ex vivo* Expanded Hematopoietic Stem Cells Overcome the MHC Barrier in Allogeneic Transplantation

Best research project in andrology field

- **Kristian Almstrup,** Denmark
  Screening of Subfertile Men for Testicular Carcinoma in Situ by an Automated Image Analysis-based Cytological Test of the Ejaculate

Best research projects in female infertility field (share)

- **Wenjie Zhu,** China
  Transvaginal Ultrasound-guided Ovarian Interstitial Laser Treatment in Anovulatory Women with Polycystic Ovary Syndrome: A Randomized Clinical Trial on the Effect of Laser Dose Used on the Outcome

- **Kaei Nasu,** Japan
  Role of Mevalonate-Ras Homology (Rho)/Rho-associated Coiled-Coil-Forming Protein Kinase-mediated Signaling Pathway in the Pathogenesis of Endometriosis-associated Fibrosis

Best research project in reproductive genetic field

- **Signe Atlmäe,** Sweden
  Interactorme of Human Embryo Implantation: Identification of Gene Expression Pathways, Regulation, and Integrated Regulatory Networks

Best research project in embryology field

- **Laura Cecilia Giojalas,** Argentina
  Sperm Chemotaxis towards Progesterone, a Guiding Mechanism That May Be Used to Select the Best Spermatozoa for Assisted Reproduction

### Iranian Winner:

- **Alireza Pouya**
  Human Induced Pluripotent Stem Cells Differentiation into Oligodendrocyte Progenitors and Transplantation in a Rat Model of Optic Chiasm Demyelination



## The Fourteenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



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September 2013

Received Papers: 206

### International Winners:

Best research project in stem cell biology & technology field

- **Antonio Uccelli,** Italy
  Mesenchymal Stem Cells Shape Microglia Effector Functions Through the Release of CX3CL1

Best research project in reproductive genetic & andrology fields

- **Pierre F Ray,** France
  Search for Genetic Causes of Male Infertility

Best research project in female infertility field

- **Paola Panina Bordignon,** Italy
  The Selective Vitamin D Receptor Agonist Elocalcitol Reduces Development of Endometriosis and Formation of Peritoneal Adhesion in a Mouse Model

Best research project in embryology field

- **Mariano Buffone,** USA
  Role of Actin Cytoskeleton During Mouse Sperm Acrosomal Exocytosis

### Iranian Winners:

- **Ashraf Moini**
  Risk Factors Associated with Endometriosis Among Iranian Infertile Women

- **Malek Hossein Asadi**
  OCT4B1, A Novel Spliced Variant of OCT4, Is Highly Expressed in Gastric Cancer and Acts as an Antiapoptotic Factor

- **Hossein Mozdarani**
  Genome Instability and DNA Damage in Male Somatic and Germ Cells Expressed as Chromosomal Microdeletion and Aneuploidy Is a Major Cause of Male Infertility

- **Armin Towhidi**
  Omega-3 Fatty Acids Accompanied with A-Tocopherol Improved Fresh and Post-thaw Sperm Quality in Ruminants

## The Fifteenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



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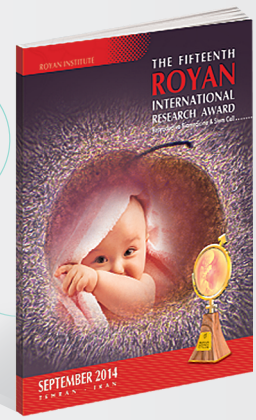


September 2014

Received Papers: 222

### International Winners:

Best research project in regenerative medicine field

- **Anne S. Baron-Van Evercooren,** France
  Role of Endogenous Neural Precursor Cells in Multiple Sclerosis

Best research project in stem cell biology & technology field

- **Milena Bellin,** Netherlands
  Human Pluripotent Stem Cells for Modelling and Correcting Long-QT Syndrome

Best research project in andrology & reproductive genetic fields

- **Sophie Rousseaux,** France
  Male Genome Programming, Infertility and Cancer

Best research project in female infertility field

- **Christiani Andrade Amorim,** Belgium
  New Steps Towards the Artificial Ovary

Best research project in embryology & biotechnology fields

- **Guoping Fan,** USA
  Transcriptome Dynamics of Human and Mouse Preimplantation Embryos Revealed by Single Cell RNA-sequencing

Best research project in ethics field

- **Kristien Hens,** Netherlands
  Towards the Transparent Embryo? Dynamics and Ethics of Comprehensive Pre-implantation Genetic Screening

### Iranian Winners:

- **Seyedeh Nafiseh Hassani**
  The Augmented BMP Pluripotency Pathway via TGF-$\beta$ Suppression Maintains the Ground State of Embryonic Stem Cells Self-Renewal

- **Rouhollah Fathi**
  Optimal Strategy Toward Fertility Preservation: *in vivo* and *in vitro* Post-thaw Options in Gamete, Embryo and Ovarian Tissue Cryostorage

## The Sixteenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



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September 2015

Received Papers: 204



### International Winners:

Best research project in female infertility field

- **Geetanjali Sachdeva**, India
  Endometrial Secretome and Its Role in Uterine Functions

Best research project in embryology field

- **Priyanka Parte,** India
  Tubulin Reversible Acetylation – Driving the Moves and the Moves Behind the Drive

Best research project in biotechnology field

- **Zhang,** USA
  Identifying and Overcoming an Epigenetic Barrier for SCNT Reprogramming

Best research project in reproductive genetic field

- **Masoud Zamani Esteki,** Belgium
  Concurrent Whole-Genome Haplotyping and Copy Number Profiling of Single Cells

Best research project in stem cell biology and technology field

- **Guoliang Xu,** China
  DNA Oxidation Towards Totipotency in Mammalian Development

### Iranian Winners:

- **Maryam Shahhoseini**
  Expression Profile of Macrophage Migration Inhibitory Factor (MIF) Signaling Pathway as a Potentional Biomarker in Pathophysiology of Endometriosis

- **Morteza Mahmoudi**
  Bioinspired Substrates Direct the Fate of Stem Cells

## The Seventeenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



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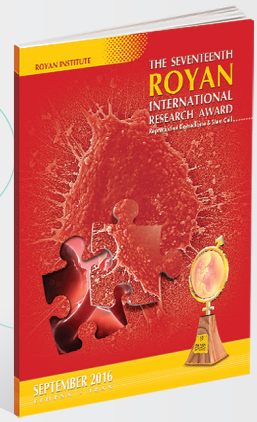


September 2016

Received Papers: 175

### International Winners:

Best research project in biotechnology field

- **Jianguo Zhao,** China
  High Efficient Genome Editing in Pigs for Making Human Disease Models

Best research project in embryology field

- **Peter Koopman,** Australia
  Validation of Retinoic Acid as the Master Inducer of Meiosis in Fetal Germ Cells

Best research project in regenerative medicine field

- **Mohammad Sharif Tabebordbar,** USA
  *In vivo* DMD Gene Editing in Muscles and Muscle Stem Cells of Dystrophic Mice

Best research project in reproductive genetic field

- **Miguel Ramalho-Santos,** USA
  Hira-Mediated H3.3 Incorporation Is Required for DNA Replication and Ribosomal RNA Transcription in the Mouse Zygote

Best research project in stem cell biology and technology field

- **Xiaohua Shen,** China
  Cis-regulatory Roles of lncRNAs in Transcription Regulation and Stem Cell Differentiation

### Iranian Winners:

- **Mohsen Sharafi**
  Optimization of Domestic Animal Sperm Freezing Using Novel Plant-Origin Cryopreservation Media

- **Anahita Mohseni Meybodi**
  Beneficial Application of Molecular Cytogenetics in Delineation of Chromosomal Abnormalities Involved in Male Infertility: From Rare to Care

- **Kamran Ghaedi**
  Utilization of Pioglitazone as a Novel Approach to Increase the Colony Formation Efficiency of Individualized Human Pluripotent Stem Cells



## The Eighteenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology






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September 2017

Received Papers: 239

### International Winners:

Best research project in stem cell biology and technology field

- **Thomas Braun**, Germany
  Compaction of Chromatin Seals Quiescence of Muscle Stem Cells

Best research project in embryology field

- **David Greening,** Australia
  Exosomes: A New Paradigm in Embryo-Maternal Cross-Talk for Successful Implantation

Best research project in regenerative medicine field

- **Riccardo Fodde,** Neatherlands
  Diet, Inflammation, and Stem Cells: Trading off Regenerative Response with Cancer Risk

Best research project in reproductive genetic field

- **Kaei Nasu,** Japan
  Roles of Aberrantly Expressed microRNAs in Endometriosis

Best research project in female infertility field

- **Khaleque Khan,** Japan
  Molecular Detection of Intrauterine Microbial Colonization in women with Endometriosis

### Iranian Winners:

- **Mahnaz Ashrafi**
  Assisted Reproductive Outcomes in Women with Different Polycystic Ovary Syndrome Phenotypes: The Predictive Value of Anti-Müllerian Hormone

- **Fereshteh Esfandiari**
  *in vitro* Generation of Meiosis-Competent Germ Cells from Embryonic Stem Cells by Engineering the Delivery of BMP4

- **Mahdi Sheikh**
  Granulocyte Colony Stimulating Factor in Repeated IVF Failure: A Randomized Trial

- **Hossein Ghanbarian**
  RNA-Directed Programming of Embryonic Stem Cell

- **Kambiz Gilani**
  Untargeted Metabolomic Profiling of Seminal Plasma in Non-obstructive Azoospermia Men: A Non-invasive Detection of Spermatogenesis

## The Nineteenth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology



# 19




August 2018

Received Papers: 191

### International Winners:

Best research project in stem cell biology and technology field

- **SaverioBellusci**, Germany
  Two-Way Conversion Between Lipogenic and Myogenic Fibroblastic Phenotypes Marks the Progression and Resolution of Lung Fibrosis

Best research project in embryology & andrology fields

- **Reza Nosrati,** Australia
  Microfluidics for Male Fertility

Best research projects in reproductive genetic field

- **Pradeep Kumar**, India (share Winner)
  Epigenetic Regulation of Coding and Non-coding RNA Expression During the 1st Wave of Spermatogenesis

- **Amir Amiri-Yekta**, Iran (Share Winner)
  Genetics and Molecular Characterization of the Multiple Morphological Abnormalities of the Sperm Flagella (MMAF) Syndrome

Best research project in female infertility field

- **Teresa Kaye Woodruff**, USA
  A Bioprosthetic Ovary Created Using 3D Printed Microporous Scaffolds Restores Ovarian Function in Sterilized Mice

Best research project in biotechnology field

- **Ali FouladiNashta**, UK
  Impact of Sperm Hyaluronidase and VLMWHA on Sheep Blastocyst Formation *in vitro*, Viability After Cryopreservation and Pregnancy Rate After Embryo Transfer

### Iranian Winners:

- **Sarah Rajabi**
  Bioengineering of a Humanized Heart by Seeding of hiPSC-Derived Cardiovascular Progenitor Cells into Growth Factor-Tethered Rat Heart Matrix

- **Mazdak Razi**
  Antioxidant, Anti-inflammatory and Testosterone Therapy Reinforces Spermatogonial Stem Cells Self-Renewal in Experimentally-Induced Varicocele; Possible Mechanisms



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## The Twentieth

# ROYAN

## International Research Award

Reproductive Biomedicine, Stem Cell Biology & Technology




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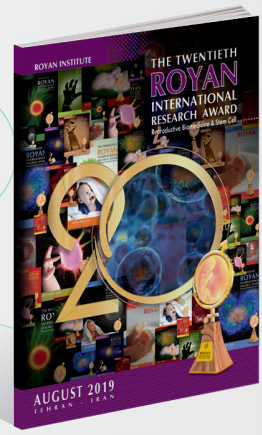


August 2019

Received Papers: 67

### International Winner:

Best research project in Reproductive Biomedicine field

- **Jemma Evans**, Australia
  The Negative Impact of Obesity Associated Advanced Glycation End Products on Female Fertility

### Iranian Winner:

- **Mehdi Totonchi**
  Application of Genomic Studies in Uncovering Sperm Defects Mechanisms

# Board

## JURIES

| Last Name, First Name, Degree | Country |
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| **Acker,** Jason, PhD | Canada |
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| **Alborzi,** Saeed, MD | Iran |
| **Alini,** Mauro, PhD | Switzerland |
| **Alipour,** Hiva, DVM, PhD, Postdoc | Denmark |
| **Almstrup,** Kristian, PhD | Denmark |
| **Amirchaghmaghi,** Elham, MD, PhD | Iran |
| **Amiri-Yekta,** Amir, PhD | Iran |
| **Ashrafi,** Mahnaz, MD | Iran |
| **Azin,** Seyed Ali, MD, PhD, FECSM | Iran |
| **Baghaban Eslaminejad,** Mohamadreza, PhD | Iran |
| **Bazrgar,** Masood, PhD | Iran |
| **Benagiano,** Giuseppe, MD, PhD, FACOG, FICOG, FRCOG | Switzerland |
| **Dalman,** Azam, PhD | Iran |
| **Daya,** Salim, MBChB, FRCSC | Canada |
| **De Geyter,** Christian, MD | Switzerland |
| **Dini,** Luciana, PhD | Italy |
| **Drevet,** Joel, PhD | France |
| **Ebrahimi,** Bita, PhD | Iran |
| **Ebrahimi,** Marzieh, PhD | Iran |
| **Eftekhari-Yazdi,** Poopak, PhD | Iran |
| **Eqbalsaeed,** Shahin, PhD | Iran |
| **Ghaffari,** Firoozeh, MD | Iran |
| **Ghanian,** Mohammad Hossein, PhD | Iran |
| **Gheisari,** Yousof, MD, PhD | Iran |
| **Gourabi,** Hamid, PhD | Iran |
| **Greening,** David, PhD | Australia |
| **Hafezi,** Maryam, MD | Iran |
| **Hajian,** Mahdi, PhD | Iran |
| **Hammarberg,** Karin, RN, PhD | Australia |
| **Hassani,** Fatemeh, PhD | Iran |
| **Hassani,** Seyedeh Nafiseh, PhD | Iran |
| **Hescheler,** Jurgen, Dr med, Drhc | Germany |
| **Hosseini,** Roya, MD | Iran |
| **Hosseini,** Samaneh, PhD | Iran |
| **Huhtaniemi,** Ilpo, MD, PhD | UK |
| **Inanloorahatloo,** Kolsoum, PhD | Iran |
| **Jafarpour,** Farnoosh, PhD | Iran |
| **Javan,** Mohammad, PhD | Iran |
| **Johnson,** Martin, MA, PhD | UK |

| Last Name, First Name, Degree | Country |
|---|---|
| **Kalantar,** Seyed Mehdi, PhD | Iran |
| **Kamali,** Koorosh MD, MPH, PhD | Iran |
| **Karimian,** Leila, MSc | Iran |
| **Khalili,** Mohammad Ali, PhD | Iran |
| **Kiani,** Sahar, PhD | Iran |
| **Kim,** Jeong Beom, PhD | Korea |
| **Koopman,** Peter, MD | Australia |
| **Kumar,** Pradeep, PhD | India |
| **Madani,** Hoda, MD, PhD | Iran |
| **Madani,** Tahereh, MD | Iran |
| **Malek,** Mahrooz, MD | Iran |
| **Maranna,** Sandy, FASA, FHEA, AFHERDSA | Australia |
| **Meyfour,** Anna, PhD | Iran |
| **Moghaddasali,** Reza, PhD | Iran |
| **Mohammadi,** Parvaneh, PhD | Iran |
| **Mohseni,** Jafar, PhD | Iran |
| **Mohseni Meybodi,** Anahita, PhD | Canada |
| **Moini,** Ashraf, MD | Iran |
| **Montano,** Luigi, MD | Italy |
| **Moradi,** Sharif, PhD | Iran |
| **Movahedin,** Mansoureh, PhD | Iran |
| **Mukhopadhyay,** Asok, PhD | India |
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| **Nematollahi-mahani,** SeyedNoureddin, PhD | Iran |
| **Nussler,** Andreas, PhD | Germany |
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| **Pahlavan,** Sara, PhD | Iran |
| **Parsanezhad,** Mohammad Ebrahim, MD | Iran |
| **Piryaei,** Abbas, PhD | Iran |
| **Rajabi,** Sarah, PhD | Iran |
| **Ramezanzadeh,** Fatemeh, MD | Iran |
| **Rashidi,** Batool, MD | Iran |
| **Ray,** Pierre F, PhD | France |
| **Rezazadeh,** Mojtaba, PhD | Iran |
| **Sabour,** Davood, PhD | Iran |
| **Sajjadi,** Hessam-oddin, MD | Iran |
| **Samadi-Kuchaksaraei,** Ali, PhD | Iran |
| **Saric,** Tomo, MD, PhD | Germany |
| **Satarian,** Leila, PhD | Iran |



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## JURIES ...

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| **Taghiyar,** Leila, PhD | Iran |
| **Tahamtani,** Yaser, PhD | Iran |
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| **Thorn,** Petra, PhD | Germany |

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| **Varzideh,** Fahimeh, PhD | USA |
| **Vosough,** Massoud, PhD | Iran |
| **Zafarani,** Fatemeh, PhD Student | Iran |
| **Zahedi Anaraki,** Farzaneh, MD | Iran |
| **Zamani,** Mahdi, PhD | Iran |
| **Zamanian,** Mohammadreza, MD, PhD | Iran |
| **Zandieh,** Zahra, PhD | Iran |
| **Zarei Moradi,** Shabnam, PhD | Iran |
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| **Afsharian,** Parvaneh, PhD | Iran |
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| **Moini,** Ashraf, MD | Iran |
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| **Sadeghi,** Mohamad Reza, PhD | Iran |
| **Sadighi Gilani,** Mohammad Ali, MD | Iran |
| **Sadri- Ardakani,** Hooman, MD, PhD | USA |
| **Saeidi,** Hojjatollah, PhD | Iran |
| **Salamati,** Masoumeh, MD | Iran |

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| **Tavalaee,** Marziyeh, PhD | Iran |
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| **Azimi,** Reza, BSc |
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| **Sheikhan,** Mahsa, MSc |
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| **Jafarpour,** Farnoush, PhD |

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| **Jangkhah,** Meysam, PhD |
| **Khadem Sharif,** MohammadReza, MA |
| **Lotfipanah,** Mahdi, MSc |
| **Mirshekar,** Zeynab, BSc |
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| **Zoghi,** Fereshteh, BSc |



# Kazemi Prize




## About Kazemi Prize

Dr Saeid Kazemi Ashtiani was born in March 1961 in Tehran. Upon completion of his high school at the age of 18, he was admitted to Iran Medical University to pursue his studies in the field of Physiotherapy. He graduated in 1991 and subsequently in 1993 he started his postgraduate education in the field of Anatomy (Embryology branch) in Tarbiat Modaress University. He received his Doctorate Degree with Distinction In 1998.

Dr Kazemi established Royan Institute in 1991. This institute renders advanced medical services to infertile couples. The center is also one of the most important and active research centers in the Middle East.

Dr Kazemi and his colleagues at Royan Infertility Research Center could achieve a tremendous success in 2003 by establishing human embryonic stem cell line. This great scientific achievement has earned a high position for Iran among the other top 10 countries having access to this advanced technology at that time.

He was not only a scientist who led a lot of principle research projects in the field of stem cell and cloning but a great manager as well. He was the head of ACECR, Iran Medical University branch, head of Royan Institute, guest instructor and lecturer of many Iranian medical universities, manager and chief of quarterly scientific and research journal of Yakhteh, head of ethical research committee in Royan Institute, and an active member of Iranian society for reproductive biomedicine as well as Iran Anatomical Science Society. Dr Saeid Kazemi also presided Royan International Award, which was held six times from 2000-2005. His short fruitful life was ended in 2006 when he died of a sudden heart attack.

To respect his efforts and revive his memories amongst national and international scientists as well as nonscientists, Iran supreme leader, Ayatollah Khamenei recommended establishing a yearly prize in biology entitled “Kazemi Prize” which will be awarded to a scientist who made an extraordinary progress in the biological sciences. Kazemi Research Award is for appreciation of extreme effort of the scientist who dedicates his/her life to make progress in human life and relief people’s pain.

A nomination committee consisting of prominent national and international scientists is the working body that evaluates the nominees and presents its recommendations to the scientific board of the institute. The scientific board is responsible for the final selection of the prize laureates.

In 2010 the first Kazemi Prize was awarded to Prof Rudolf Jaenisch; one of the most innovative and creative scientists in the field of developmental biology, gene regulation, stem cell biology and stem cell-mediated therapies.

In 2011 the second Kazemi Prize was awarded to Prof Hans Robert Schöler; a world-renowned researcher who has made significant contributions to the field of stem cell biology over the past 40 years.

The third Kazemi Prize was awarded to Prof Robert S. Langer; one of the most important individuals in biotechnology in the world and one of the best innovators worldwide.

In 2016 the fourth Kazemi Prize recipient was Professor Hans Clevers; a geneticist, physician, medical researcher and a professor in molecular genetics who was the first to identify stem cells in the intestine and one of the world's leading researchers on normal stem cells and their potential for regenerative therapy.

In 2018 the fifth Kazemi Prize was awarded to Professor Michele De Luca; the full professor of biochemistry, and the director of Centre for Regenerative Medicine at University of Modena and Reggio Emilia, and the scientific director of Holostem Terapie Avanzate S.r.l. He has reported lifesaving regeneration of the entire human epidermis of a Junctional EB patient by means of transgenic epidermal stem cells.

## KAZEMI PRIZE WINNERS



**Prof Rudolf Jaenisch**
2010



**Prof Hans Robert Schöler**
2011



**Prof Robert S. Langer**
2015



**Prof Hans Clevers**
2016



**Prof Michele De Luca**
2018

# **ROYAN** INSTITUTE




www.royan.org

Royan Institute is a renowned center committed to multidisciplinary, campus-wide, integration and collaboration of academic and medical personnel for understanding male/female infertility, embryo development, stem cell biology, and biotechnology. Royan Institute provides comprehensive services for the infertility treatment, regenerative medicine/cell therapy, production of recombinant proteins and development of biological products.
Royan Institute was established in 1991 by the late Dr Saeid Kazemi Ashtiani and a group of researchers and physicians in Iran University of Medical Sciences of Academic Center for Education, Culture and Research (ACECR) as an outpatient surgery center to provide medical services to infertile couples as well as research and training in reproductive sciences. In 2002, the research fields in Royan Institute extended into stem cell studies as well. Afterward the research findings were adjusted to application in regenerative medicine and cell therapy approaches. After succeeding three decades, Royan Institute focuses on increasing the success rate of infertility treatment alongside embryo health, and the level of public health through cell therapy clinical services.
Royan Institute now wishes in its 2025 vision to become the excellence in research, technology, education and treatment at the international level, likewise the scientific reference of stem cell science, biotechnology, reproductive biomedicine, and regenerative medicine and to be efficient in health of the society.

## Mission

The mission of Royan Institute, which is aligned with the country's comprehensive scientific roadmap and the ACECR development plan, can be categorized in the following aspects:

- Research and development of science and technology in the fields of reproductive biomedicine, stem cells and biotechnology
- Education and promotion of scientific findings at national and international levels
- Commercialization of research findings to offer services and biological products for the purpose of resolving the country's specialized needs
- Treatment of infertile patients and difficult-to-treat diseases by the efficient use of research findings

## Vision

Royan Institute is a center of excellence in research and technology at an international level, a pioneer in development of science, technology and innovation of biological sciences, and an internationally renowned authority on stem cells science, reproduction, biotechnology, and regenerative medicine alongside its effective role in improving the society's health.

## Overview of the Institute

- The first IVF child born in Tehran (1993)
- The first ICSI child born in Tehran (1995)
- Iran's second success in open testicular biopsy to treat severe male infertility (1996)
- The first frozen embryo child born in Iran (1996)
- The first ICSI birth by frozen sperm of a gonadectomized man in Iran (1999)
- The first human embryonic stem cell line established in Iran and the region (2003)
- The first PGD child born in Iran (2004)
- First time use of adult stem cells in the treatment of MI during CABG in Iran (2004)
- Production the insulin producing cells from human embryonic stem cells (2004)
- Culture of human limbal stem cells on chorionic membrane (2004)
- Establishment of the first Private Cord Blood Bank in Iran (2005)
- The first IVM-IVF sheep born in Iran (2006)
- The first cloned sheep born in Iran (2006)
- Establishment of mouse and human induced pluripotent stem cells (iPS) (2008)
- The first cloned goat born in Iran (2009)
- A new method for treatment of Vitiligo by cell transplantation (2009)
- The first transgenic goats born in Iran (2010)
- The first calves born from vitrified in vitro developed embryos in Iran (2011)
- Establishment of cell therapy pre-hospital (2011)
- Establishment of Stem Cell Bank (2011)
- The first healthy child birth after Molecular PGD for beta-thalassemia in Iran (2012)
- Birth of eight cloned goats through the simplified method of SCNT in Iran (2013)
- Birth of the first cloned wild ram as an endangered species in Iran (2015)
- The first cryopreserved human ovarian tissue auto-transplantation in cancer patient (2017)



- Establishment of the Faculty of Basic Sciences and Medical Technology in Royan Institute (2018)
- Obtaining the license of producing Kimia-cell in GMP conditions from Iran FDA (2019)
- Producing the transgene Covidsa mouse for pre-clinical studies of Covid-19 vaccines (2020)
- Implementing the phase I clinical trial for Natural Killer cell therapy for pediatric glioblastoma (2021)
- Commercialization of the first cell therapy product in the pharmaceutical market in Iran (2022)

### Honors

- Honoring the Ever-lasting Personage Prize, 2004
- Receiving several Razi Research Awards on Medical Science hosted by Iran Ministry of Health and Medical Education
- Being selected by Iran National Award for the Book of the Year, 2009
- Earning the scientific Hippocrates Prize, 2012
- Winning the UNESCO Prize, 2014
- Winning Allameh Tabatabaei Award hosted by Iran vice Presidency for Science and Technology, Presidency and National Elite Foundation, 2014
- Receiving The Islamic Educational, Scientific, and Cultural Organization "ISESCO"- Sicence and Technology Prize, 2010
- Earning The World Academy of Science "TWAS" Prize, 2019
- Gaining the 32nd Khawrizmi Award, 2019
- Receiving the Mustafa Prize, 2019
- Winning Dayong Gao Young Investigator Award, 2022



## Royan Scientific Committee

This committee, as the highest scientific decision-making discipline of Royan Institute, consists of the president of the institute, the deputy directors of the institute, the heads of the research institutes and several members of the academic faculty from the research institutes and ACECR.



### Goals

- Determining the general policy, developing annual, mid-term and long-term plans in order to expand scientific activities in national or international level based on the twenty-year vision of ACECR
- The supervision and evaluation of the results of research and educational activities and the approval of the regulations
- Approval of the program of postgraduate courses, scientific meetings, congresses and awards; The scientific committee is responsible for making decisions about regulations and programs for any international level event
- Reviewing and approving the annual report of the institute's scientific activities
- Verification of the academic qualification of applicants

## Royan Ethics Committee

The Ethical Committee of Royan was established in 2003 consisting ethicists, researchers, medical doctors, religious scholars, epidemiologists, law experts and community representatives.

### Goals

- Evaluation of research projects in Royan Institute from the ethical point of view
- Evaluation of the cases presented by the clinical wards and solve the ethical and law issues

### Main Activities

The activities of this committee are focused on the two axes of the organizational ethics committee and the medical ethics committee, which are as follows:

- Reviewing and approving research institutes' projects
- Reviewing and approving projects outside the research institutes
- Dealing with referrals from the therapeutic sections
- Approving the ethical guidelines for implementation in the therapeutic sections





# RESEARCH

## Royan Institute for Reproductive Biomedicine

Royan Institute for Reproductive Biomedicine (RI-RB) tries to increase the fertility success rate alongside improving the embryo health through doing researches in different aspects of infertility and its treatment, with the vision of improving the population's health. The main focus of research in the six departments of RI-RB includes: improving ovarian stimulation protocols; improving embryo implantation conditions; etiological diagnosing of embryo implantation failures and spontaneous abortions; improving sperm quality, count, selection and isolation methods; evaluating the side effects of cancer treatments on gametes; studying the ovarian tissue cryopreservation and in vitro culture of ovarian follicles; early diagnosing of fetal anomalies; epigenetic study of sperm, oocytes and embryos pre-implantation genetic diagnosis; evaluating the environmental and occupational factors affecting reproduction; studying the effect of quality of life parameters on infertility treatment.
The vision of this institute is to achieve the accurate diagnosis and treatment of infertility based on modern reproductive science, which will lead to healthy newborns in a short period of time. This Institute mission is to research on fertility improvement and increase the pregnancy rate resulting in healthy live births.

### RI-RB Departments

- Embryology
- Endocrinology and Female Infertility
- Ethics and Medical Law
- Male Infertility
- Reproductive Genetics
- Reproductive Imaging

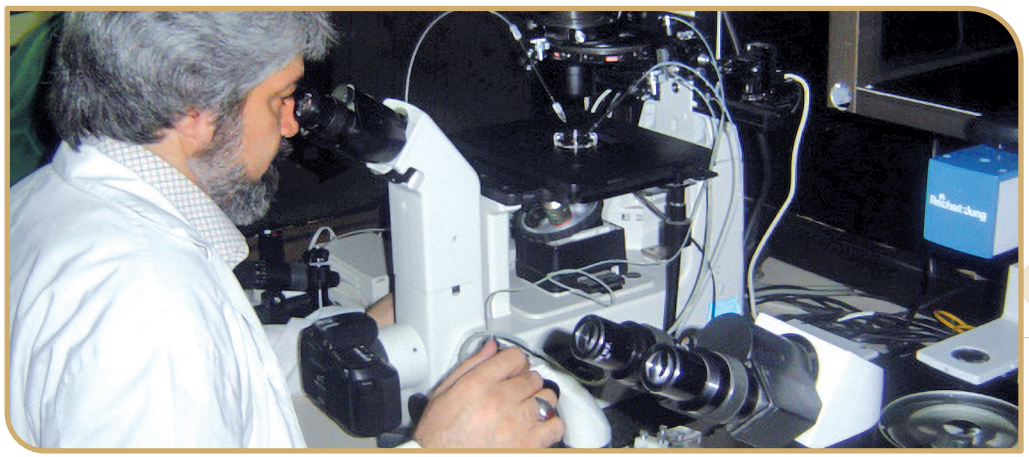
For more communication between basic sciences and clinics, there are also six initiatives:

- Recurrent Implantation Failure (RIF) and Recurrent Spontaneous Abortion (RSA)
- Premature Ovarian Failure (POF)
- Polycystic Ovary Syndrome (PCOS)
- Oncofertility
- Endometriosis
- Andrology

## Embryology Department

### Introduction

The Department of Embryology was founded in 1997. During the preceding decade, a fundamental description of animal and human experimental studies has emerged in the field of embryology.



### Goals

- Increasing the quality of gametes and embryos
- Establishing in vitro human follicle culture following ovarian tissue cryopreservation

## Main Activities

- Evaluation of the molecular aspects of gamete maturation and embryo development
- Performing embryo co-culture with various types of somatic cells
- In vitro maturation of animal and human gametes
- Evaluating molecular and cellular events of embryo implantation
- Three-dimensional culture of cells to design an endometrial biomodel
- Three-dimensional culture of follicles in order to acquire good quality oocytes
- Performing nuclear transfers
- Finding the best method for preserving gametes, ovarian and testicular tissues

## Selectd Articles (2021)


1. Ramezankhani, R., Minaei, N., Haddadi, M., Solhi, R., Taleahmad, S.**The impact of sex on susceptibility to systemic lupus erythematosus and rheumatoid arthritis; a bioinformatics point of view** (2021) Cellular Signalling, 88, art. no. 110171 .

2. Ghezelayagh, Z., Zabihi, M., Kazemi Ashtiani, M., Ghezelayagh, Z., Lynn, F.C., Tahamtani, Y. **Recapitulating pancreatic cell–cell interactions through bioengineering approaches: the momentous role of non-epithelial cells for diabetes cell therapy** (2021) Cellular and Molecular Life Sciences, 78 (23), pp. 7107-7132.

3. Emami, N., Moini, A., Yaghmaei, P., Akbarinejad, V., Shahhoseini, M., Alizadeh, A.R. **Differences in expression of genes related to steroidgenesis in abdominal subcutaneous adipose tissue of pregnant women with and without PCOS; a case control study** (2021) BMC Pregnancy and Childbirth, 21 (1), art. no. 490 .

4. Sarabadani, M., Tavana, S., Mirzaeian, L., Fathi, R. **Co-culture with peritoneum mesothelial stem cells supports the in vitro growth of mouse ovarian follicles** (2021) Journal of Biomedical Materials Research - Part A, 109 (12), pp. 2685-2694.

5. Mashayekhi, M., Mirzadeh, E., Chekini, Z., Ahmadi, F., Eftekhari-Yazdi, P., Vesali, S., Madani, T., Aghdami, N. **Evaluation of safety, feasibility and efficacy of intra-ovarian transplantation of autologous adipose derived mesenchymal stromal cells in idiopathic premature ovarian failure patients: non-randomized clinical trial, phase I, first in human** (2021) Journal of Ovarian Research, 14 (1), art. no. 5 .

6. Bahrehbar, K., Khanjarpoor Malakhond, M., Gholami, S. **Tracking of human embryonic stem cell-derived mesenchymal stem cells in premature ovarian failure model mice** (2021) Biochemical and Biophysical Research Communications, 577, pp. 6-11.

7. Shalileh, S., Khayamian, M.A., Ghaderinia, M., Abadijoo, H., Hassanzadeh-Moghadam, H., Dalman, A., Simaee, H., Faramarzpour, M., Ghaznavi, P., Soltan Khamsi, P., Abbasvandi, F., Faranoush, M., Anbiaei, R., Eftekhari-Yazdi, P., Abdolahad, M. **Label-free mechanoelectrical investigation of single cancer cells by dielectrophoretic-induced stretch assay** (2021) Sensors and Actuators, B: Chemical, 346, art. no. 130409 .

8. Faraji, S., Sharafi, M., Shahverdi, A., Fathi, R. **Sperm associated antigens: Vigorous influencers in life** (2021) Cell Journal, 23 (5), pp. 495-502.

9. Shabani, M., Totonchi, M., Rezaeimirghaed, O., Gachkar, L., Hajiesmaeili, M., Khoshkar, A., Amirdosara, M., Saffaei, A., Shokouhi, S., Mardani, M., Alavi Darazam, I., Karami, A., Sharifi, M., Zaman, M., Abedheydari, E., Sahraei, Z. **Evaluation of the prophylactic effect of hydroxychloroquine on people in close-contact with patients with COVID-19** (2021) Pulmonary Pharmacology and Therapeutics, 70, art. no. 102069.

10. Hezavehei, M., Shokoohian, B., Nasr-Esfahani, M.H., Shpichka, A., Timashev, P., Shahverdi, A., Vosough, M. **Possible male reproduction complications after Coronavirus pandemic** (2021) Cell Journal, 23 (4), pp. 382-388.

11. Hezavehei, M., Sharafi, M., Fathi, R., Shahverdi, A., Gilani, M.A.S. **Membrane lipid replacement with nano-micelles in human sperm cryopreservation improves post-thaw function and acrosome protein integrity** (2021) Reproductive BioMedicine Online, 43 (2), pp. 257-268.




12. Aeeni, M., Razi, M., Alizadeh, A., Alizadeh, A. **The molecular mechanism behind insulin protective effects on testicular tissue of hyperglycemic rats** (2021) Life Sciences, 277, art. no. 119394 .

13. Navabi, R., Negahdari, B., Hajizadeh-Saffar, E., Hajinasrollah, M., Jenab, Y., Rabbani, S., Pakzad, M., Hassani, S.-N., Hezavehei, M., Jafari-Atrabi, M., Tahamtani, Y., Baharvand, H. **Combined therapy of mesenchymal stem cells with a GLP-1 receptor agonist, liraglutide, on an inflammatory-mediated diabetic non-human primate model** (2021) Life Sciences, 276, art. no. 119374 .

14. Montazeri, L., Mohajeri, M., Baharvand, H., Fathi, R., Poli, V., Kazemi, S., Pahlavan, F., Kouhestani, S., Ahmadi, F., Mowla, S.J. **Two leading international congresses in Iran in the era of COVID-19: 21st royan international twin congress, 4th international and 16th Iranian genetics congress** (2021) BioEssays, 43 (6), art. no. 2100078.

15. Rahimi, M., Rahimi, S., Sharafi, M., Shahverdi, A., Grimes, J.L. **The effect of methyl-beta-cyclodextrin on DNA absorption and quality of posttransfected sper**m (2021) Poultry Science, 100 (5), art. no. 101058.

16. Oveisi, A., Vahdati, A., Shahhoseini, M., Favaedi, R., Maroufizadeh, S., Movaghar, B. **Ovulation induction changes epigenetic marks of imprinting genes in mice fetus organs** (2021) Cell Journal, 23 (1), pp. 99-108.

17. Totonchi, M., Najafi, H., Valojerdi, M.R., Eftekhari-Yazdi, P., Karimian, L., Mashayekhi, M., Madani, T. **Preimplantation genetic screening and the success rate of in vitro fertilization: A three-years study on Iranian population** (2021) Cell Journal, 22 (4), pp. 467-475.

18. Hezavehei, M., Mirzaei, M., Sharafi, M., Wu, Y., Gupta, V., Fitzhenry, M., Kouchesfahani, H.M., Eftekhari-Yazdi, P., Baharvand, H., Dalman, A., Haynes, P.A., Shahverdi, A., Salekdeh, G.H. **Proteomics study reveals the molecular mechanisms underlying cryotolerance induced by mild sublethal stress in human sperm** (2021) Cell and Tissue Research . Article in Press.

19. Ghaleno, L.R., Alizadeh, A., Drevet, J.R., Shahverdi, A., Valojerdi, M.R. **Oxidation of sperm dna and male infertility** (2021) Antioxidants, 10 (1), art. no. 97, pp. 1-15.

20. Ramezankhani, R., Minaei, N., Haddadi, M., Torabi, S., Hesaraki, M., Mirzaei, H., Vosough, M., Verfaillie, C.M. **Gene editing technology for improving life quality: A dream coming true?** (2021) Clinical Genetics, 99 (1), pp. 67-83.

## Endocrinology and Female Infertility Department

### Introduction

This department was established in 1994 to study on new strategies for diagnosis and treatment of female infertility and recurrent abortion with the intent of increasing the embryo implantation rates.



## Goals

- Improving in vitro fertilization (IVF) outcomes
- Providing appropriate clinical guidelines for treatment of women suffering from endometriosis, recurrent implantation failure and oncofertility
- Improving methods for oocyte pick up and embryo implantation
- Increasing pregnancy and live birth rate

## Main Activities

- Evaluation and treatment of infertile women
- Achieving new strategies for diagnosing female infertility causes
- Prenatal evaluation
- Planning educational seminars annually for patients and adolescent girls to raise the level of knowledge and awareness of society and prevention of complications and infertility problems related to endometriosis and polycystic ovary syndrome
- Arranging training classes for couples to improve their quality of life and reduce their stresses

## Selected Articles (2021)


1. Moini, A., Maajani, K., Omranipour, R., Zafarghandi, M.-R., Aleyasin, A., Oskoie, R., Alipour, S. **Residency training amid the COVID-19 pandemic: exploring the impact on mental health and training, a lesson from Iran** (2021) BMC Medical Education, 21 (1), art. no. 603.

2. Esfandiari, F., Chitsazian, F., Jahromi, M.G., Favaedi, R., Bazrgar, M., Aflatoonian, R., Afsharian, P., Aflatoonian, A., Shahhoseini, M. **HOX cluster and their cofactors showed an altered expression pattern in eutopic and ectopic endometriosis tissues** (2021) Reproductive Biology and Endocrinology, 19 (1), art. no. 132.

3. Emami, N., Moini, A., Yaghmaei, P., Akbarinejad, V., Shahhoseini, M., Alizadeh, A.R. **Differences in expression of genes related to steroidgenesis in abdominal subcutaneous adipose tissue of pregnant women with and without PCOS; a case control study** (2021) BMC Pregnancy and Childbirth, 21 (1), art. no. 490.

4. Aftabsavad, S., Noormohammadi, Z., Moini, A., Karimipoor, M. **Effect of bisphenol A on alterations of ICAM-1 and HLA-G genes expression and DNA methylation profiles in cumulus cells of infertile women with poor response to ovarian stimulation** (2021) Scientific Reports, 11 (1), art. no. 9595.

5. Pirjani, R., Moini, A., Heshmati, J., Mardi-Mamaghani, A., Esmaeili, M., Shafaatdoost, M., Maleki-Hajiagha, A., Karimi, E., Hossein-boroujerdi, M., Shokri, F., Mosanezhad, Z., Bajool, N., Noori, M., Hosseini, L., Persad, E., Sepidarkish, M. **Mothers and their children's health (MATCH): a study protocol for a population - based longitudinal cohort** (2021) BMC Pregnancy and Childbirth, 21 (1), art. no. 297.

6. Alizadeh, S., Jahanian Sadatmahalleh, S., Razavinia, F., Bahri Khomami, M., Nasiri, M., Moini, A., Ziaei, S. **Metabolic parameters in cord blood of neonate of mothers with obese and non-obese PCOS and controls: retrospective cohort study** (2021) BMC Pregnancy and Childbirth, 21 (1), art. no. 223.

7. Mirzaei, N., Jahanian Sadatmahalleh, S., Bahri Khomami, M., Moini, A., Kazemnejad, A. **Sexual function, mental health, and quality of life under strain of COVID-19 pandemic in Iranian pregnant and lactating women: a comparative cross-sectional study** (2021) Health and Quality of Life Outcomes, 19 (1), art. no. 66.

8. Nikniaz, H., Zandieh, Z., Nouri, M., Daei-farshbaf, N., Aflatoonian, R., Gholipourmalekabadi, M., Jameie, S.B. **Comparing various protocols of human and bovine ovarian tissue decellularization to prepare extracellular matrix-alginate scaffold for better follicle development in vitro** (2021) BMC Biotechnology, 21 (1), art. no. 8.

9. Mashayekhi, M., Mirzadeh, E., Chekini, Z., Ahmadi, F., Eftekhari-Yazdi, P., Vesali, S., Madani, T., Aghdami, N. **Evaluation of safety, feasibility and efficacy of intra-ovarian transplantation of autologous adipose derived esenchymal stromal cells in idiopathic premature ovarian failure patients: non-randomized clinical trial, phase I, first in human** (2021) Journal of Ovarian Research, 14 (1), art. no. 5.

10. Ranjbari, S., Khatibi, T., Vosough Dizaji, A., Sajadi, H., Totonchi, M., Ghaffari, F. **CNFE-SE: a novel approach**




**combining complex network-based feature engineering and stacked ensemble to predict the success of intrauterine insemination and ranking the features** (2021) BMC Medical Informatics and Decision Making, 21 (1), art. no. 1.

11. Aghajanpour, S., Hosseini, E., Amirchaghmaghi, E., Zandieh, Z., Amjadi, F., Yahyaei, A., Zolfaghari, Z., Aflatoonian, K., Ashrafi, M., Aflatoonian, R. **Differential expression of innate/adaptive immunity genes induced by endometrial scratching as a hopeful approach for implantation boosting in unexplained, repeated implantation failure: An RCT** (2021) Journal of Reproductive Immunology, 148, art. no. 103426.

12. Fatemi, N., Salehi, N., Pignata, L., Palumbo, P., Cubellis, M.V., Ramazanali, F., Ray, P., Varkiani, M., Reyhani-Sabet, F., Biglari, A., Sparago, A., Acurzio, B., Palumbo, O., Carella, M., Riccio, A., Totonchi, M. **Biallelic variant in cyclin B3 is associated with failure of maternal meiosis II and recurrent digynic triploidy** (2021) Journal of Medical Genetics, 58 (11), pp. 783-788.

13. Daei-Farshbaf, N., Aflatoonian, R., Amjadi, F.-S., Nikniyaz, H., Taleahmad, S., Bakhtiyari, M. **Identification of calcineurin as a predictor of oocyte quality and fertilization competence based on microarray data** (2021) Computational Biology and Chemistry, 94, art. no. 107561.

14. Shahrokhi, S.Z., Kazerouni, F., Ghaffari, F., Hadizadeh, M., Zolfaghary, Z. **The effect of A1298c polymorphism of the MTHFR gene on anti-Müllerian hormone levels: experimental and Web-based analysis** (2021) Journal of Clinical Laboratory Analysis, 35 (9), art. no. e23948.

15. Salemi, S., Yahyaei, A., Vesali, S., Ghaffari, F. **Endometrial preparation for vitrified–warmed embryo transfer with or without GnRH-agonist pre-treatment in patients with polycystic ovary syndrome: a randomized controlled trial** (2021) Reproductive BioMedicine Online, 43 (3), pp. 446-452.

16. Mousavi, S.O., Mohammadi, R., Amjadi, F., Zandieh, Z., Aghajanpour, S., Aflatoonian, K., Sabbaghian, M., Eslami, M., Madani, T., Aflatoonian, R. **Immunological response of fallopian tube epithelial cells to spermatozoa through modulating cytokines and chemokines** (2021) Journal of Reproductive Immunology, 146, art. no. 103327.

17. Yari, S., Khoei, H.H., Saber, M., Esfandiari, F., Moini, A., Shahhoseini, M. **Metformin attenuates expression of angiogenic and inflammatory genes in human endometriotic stromal cells** (2021) Experimental Cell Research, 404 (2), art. no. 112659.

18. Esfandiari, F., Heidari Khoei, H., Saber, M., Favaedi, R., Piryaei, A., Moini, A., Shahhoseini, M., Ramezanali, F., Ghaffari, F., Baharvand, H. **Disturbed progesterone signalling in an advanced preclinical model of endometriosis** (2021) Reproductive BioMedicine Online, 43 (1), pp. 139-147.

19. Zafarani, F., Ghaffari, F., Ahmadi, F., Mehranjani, M.S., Shahrzad, G. **Hysterosalpingography in the assessment of proximal tubal pathology: A review of congenital and acquired abnormalities** (2021) British Journal of Radiology, 94 (1122), art. no. 20201386.

20. Khodabandehloo, F., Aflatoonian, R., Zandieh, Z., Rajaei, F., Sayahpour, F.-A., Nassiri-Asl, M., Baghaban Eslaminejad, M. **Functional differences of Toll-like receptor 4 in osteogenesis, adipogenesis and chondrogenesis in human bone marrow-derived mesenchymal stem cells** (2021) Journal of Cellular and Molecular Medicine, 25 (11), pp. 5138-5149.

21. Montazeri, L., Mohajeri, M., Baharvand, H., Fathi, R., Poli, V., Kazemi, S., Pahlavan, F., Kouhestani, S., Ahmadi, F., Mowla, S.J. **Two leading international congresses in Iran in the era of COVID-19: 21st royan international twin congress, 4th international and 16th Iranian genetics congress** (2021) BioEssays, 43 (6), art. no. 2100078.

22. Akbari, A., Padidar, K., Salehi, N., Mashayekhi, M., Almadani, N., Sadighi Gilani, M.A., Bashambou, A., McElreavey, K., Totonchi, M. **Rare missense variant in MSH4 associated with primary gonadal failure in both 46, XX and 46, XY individual**s (2021) Human Reproduction, 36 (4), pp. 1134-1145.
23. Totonchi, M., Najafi, H., Valojerdi, M.R., Eftekhari-Yazdi, P., Karimian, L., Mashayekhi, M., Madani, T. **Preimplantation**

**genetic screening and the success rate of in vitro fertilization: A three-years study on Iranian population** (2021) Cell Journal, 22 (4), pp. 467-475.

24. Mahdian, S., Pirjani, R., Favaedi, R., Movahedi, M., Moini, A., Shahhoseini, M. **Platelet-activating factor and antiphospholipid antibodies in recurrent implantation failure** (2021) Journal of Reproductive Immunology, 143, art. no. 103251.

25. Mohtasebi, P., Eslami, M., Ramezanali, F., Borjian Boroujeni, P., Rokhsat Talab, Z., Zamanian, M. **APOE polymorphism status (E4) may help in predicting the risk of recurrent implantation failure** (2021) International Journal of Gynecology and Obstetrics. Article in Press.

26. Heshmati, J., Moini, A., Sepidarkish, M., Morvaridzadeh, M., Salehi, M., Palmowski, A., Mojtahedi, M.F., Shidfar, F. **Effects of curcumin supplementation on blood glucose, insulin resistance and androgens in patients with polycystic ovary syndrome: A randomized double-blind placebo-controlled clinical trial** (2021) Phytomedicine, 80, art. no. 153395.

27. Esfandiari, F., Favaedi, R., Heidari-Khoei, H., Chitsazian, F., Yari, S., Piryaei, A., Ghafari, F., Baharvand, H., Shahhoseini, M. **Insight into epigenetics of human endometriosis organoids: DNA methylation analysis of HOX genes and their cofactors** (2021) Fertility and Sterility, 115 (1), pp. 125-137.

## Ethics and Medical Law Department

### Introduction

Department of Ethics and Medical Law was established in 2019. Previously the activities of this department were set up in Ethics group, but recently they are extended to the following subjects of researches: ethical issues in ART, ethical issues in Regenerative Medicine, animal cloning, ethical issues in genetic researches and interventions, physician-patient relation, civil responsibilities toward patients and religious issues in medical diagnosis and treatments in both infertility and cell therapy cases.




### Goals

- Improving and releasing the guidelines and propose new law and legislations in new era of ART, Stem Cell and Biotechnology
- Solving current ethical dilemma in reproductive medicine and cell therapy
- Investigating the religious (specially Islamic) issues in clinical practice of infertility and cell therapy, and biomedical researches
- Evaluating the research proposal ethically and approve the justifiable projects in Royan Institute fields of interest

### Main Activities

- Legal counseling and solving ethical cases in ART, Stem Cell and Biotechnology fields
- Designing consent form

- Conducting ethical committee
- Performing ethical and legal researches in the interested fields of Royan Institute

### Selected Articles (2021)


1. Omani-Samani, R., Vesali, S., Navid, B., Mohajeri, M., Rafsanjani, K.A., Aghamaleki, S.Z.N., Mohammadi, M. **Adult cancer patients and parents of younger cancer patients have little information about fertility preservation: a survey of knowledge and attitude** (2021) Middle East Fertility Society Journal, 26 (1), art. no. 25.

2. Ranjbaran, M., Omani-Samani, R., Alimoradi, Z., Mansori, K., Chizari, M., Ghandian, A., Mahdavi, N., Hafezi, M. **The effect of sex education and counseling on the sexual function of Iranian reproductive age women: A systematic review and meta-analysis** (2021) Current Women's Health Reviews, 17 (3), pp. 208-217.

3. Torkamani, Z.J., Dolatian, M., Omani-Samani, R., Alizadeh, A., Navid, B. **Relationship between sexual function and type 2 diabetes in infertile men referred to Royan institute** (2021) Journal of Renal Injury Prevention, 10 (4), pp. 1-7.

4. Lotfollahi, H., Riazi, H., Omani-Samani, R., Maroufizadeh, S., Montazeri, A. **Sexual self-concept in fertile and infertile women: A comparative study** (2021) International Journal of Fertility and Sterility, 15 (1), pp. 60-64.

5. Maroufizadeh, S., Navid, B., Alizadeh, A., Amini, P., Almasi-Hashiani, A., Mohammadi, M., Khedmati Morasae, E., Omani-Samani, R. **Risk of gestational diabetes mellitus following assisted reproductive technology: systematic review and meta-analysis of 59 cohort studies** (2021) Journal of Maternal-Fetal and Neonatal Medicine, 34 (16), pp. 2731-2740.

6. Omani-Samani, R., Hollins Martin, C.J., Martin, C.R., Maroufizadeh, S., Ghaheri, A., Navid, B. **The Birth Satisfaction Scale-Revised Indicator (BSS-RI): a validation study in Iranian mothers** (2021) Journal of Maternal-Fetal and Neonatal Medicine, 34 (11), pp. 1827-1831.


## Male Infertility Department

### Introduction

This department was established in 2006 and started to study on male infertility. Thus it is necessary to use appropriate diagnostic and therapeutic techniques in order to study the different aspects of male infertility.



### Goals

- Achieving new strategies and techniques for male infertility diagnosis and treatment
- Improving new screening methods for preventing male infertility

### Main Activities

- Evaluation and treatment of infertile men
- Determining the etiology of spermatogenesis failures, sperm disfunction and ejaculation disorders
- Studying the etiology of abnormal semen parameters

## Selected Articles (2021)


1. Pirjani, R., Moini, A., Heshmati, J., Mardi-Mamaghani, A., Esmaeili, M., Shafaatdoost, M., Maleki-Hajiagha, A., Karimi, E., Hossein-boroujerdi, M., Shokri, F., Mosanezhad, Z., Bajool, N., Noori, M., Hosseini, L., Persad, E., Sepidarkish, M. **Mothers and their children's health (MATCH): a study protocol for a population - based longitudinal cohort** (2021) BMC Pregnancy and Childbirth, 21 (1), art. no. 297.

2. Ranjbari, S., Khatibi, T., Vosough Dizaji, A., Sajadi, H., Totonchi, M., Ghaffari, F. **CNFE-SE: a novel approach combining complex network-based feature engineering and stacked ensemble to predict the success of intrauterine insemination and ranking the feature**s (2021) BMC Medical Informatics and Decision Making, 21 (1), art. no. 1.

3. Mousavi, S.O., Mohammadi, R., Amjadi, F., Zandieh, Z., Aghajanpour, S., Aflatoonian, K., Sabbaghian, M., Eslami, M., Madani, T., Aflatoonian, R. **Immunological response of fallopian tube epithelial cells to spermatozoa through modulating cytokines and chemokines** (2021) Journal of Reproductive Immunology, 146, art. no. 103327.

4. Ahmadi, A., Moghadasali, R., Ezzatizadeh, V., Taghizadeh, Z., Nassiri, S.M., Asghari-Vostikolaee, M.H., Alikhani, M., Hadi, F., Rahbarghazi, R., Yazdi, R.S., Baharvand, H., Aghdami, N. **Retraction Note: Transplantation of Mouse Induced Pluripotent Stem Cell-Derived Podocytes in a Mouse Model of Membranous Nephropathy Attenuates Proteinuria** (2021) Scientific reports, 11 (1), p. 13831.

5. Lorès, P., Kherraf, Z.-E., Amiri-Yekta, A., Whitfield, M., Daneshipour, A., Stouvenel, L., et al. **A missense mutation in IFT74, encoding for an essential component for intraflagellar transport of Tubulin, causes asthenozoospermia and male infertility without clinical signs of Bardet–Biedl syndrome** (2021) Human Genetics, 140 (7), pp. 1031-1043.

6. Sharma, R., Gupta, S., Agarwal, A., Henkel, R., S...., Sabbaghian, M , Colpi, G.M, et al. **Relevance of leukocytospermia and semen culture and its true place in diagnosing and treating male infertility** (2021) World Journal of Men's Health, 39, art. no. A5.

7. Gupta, S., Sharma, R., Agarwal, A., Parekh, N., ..., Sabbaghian, M. Colpi, G.M, et al. **A comprehensive guide to sperm recovery in infertile men with retrograde ejaculation** (2021) World Journal of Men's Health, 39.

8. Ghanami Gashti, N., Sadighi Gilani, M.A., Jabari, A., Qasemi, M., Feizollahi, N., Abbasi, M. **The Germ Cell–Specific Markers ZPBP2 and PGK2 in Testicular Biopsies Can Predict the Presence as well as the Quality of Sperm in Non-obstructive Azoospermia Patients** (2021) Reproductive Sciences, 28 (5), pp. 1466-1475.

9. Akbari, A., Padidar, K., Salehi, N., Mashayekhi, M., Almadani, N., Sadighi Gilani, M.A., Bashambou, A., McElreavey, K., Totonchi, M. **Rare missense variant in MSH4 associated with primary gonadal failure in both 46, XX and 46, XY individuals** (2021) Human Reproduction, 36 (4), pp. 1134-1145.

10. Norouzi, M., Firouzi, J., Sodeifi, N., Ebrahimi, M., Miller, D.W. **Salinomycin-loaded injectable thermosensitive hydrogels for glioblastoma therapy** (2021) International Journal of Pharmaceutics, 598, art. no. 120316.

11. Ghanami Gashti, N., Sadighi Gilani, M.A., Abbasi, M. **Sertoli cell-only syndrome: etiology and clinical management** (2021) Journal of Assisted Reproduction and Genetics, 38 (3), pp. 559-572.

12. Agarwal, A., Sharma, R.K., Gupta, S..., Sabbaghian, M., Shah, R, et al. **Sperm vitality and necrozoospermia: diagnosis, management, and results of a global survey of clinical practice** (2021) World Journal of Men's Health, 39, art. no. 210149.

13. Cong, J., Wang, X., Amiri-Yekta, A., Wang, L., Kherraf, Z.-E., Liu, C., Cazin, C., Tang, S., Hosseini, S.H., Tian, S., Daneshipour, A., Wang, J., Zhou, Y., Zeng, Y., Yang, S., He, X., Li, J., Cao, Y., Jin, L., Ray, P., Zhang, F. **Homozygous mutations in CCDC34 cause male infertility with oligoasthenoteratozoospermia in humans and mice** (2021) Journal of Medical Genetics.

14. Agarwal, A., Finelli, R., Panner Selvam, M.K., ..., Sabbaghian, M., Sadighi Gilani, M.A., et al. **A global survey of reproductive specialists to determine the clinical utility of oxidative stress testing and antioxidant use in male infertility** (2021) World Journal of Men's Health, 39.

## Reproductive Genetic Department

### Introduction

Department of Reproductive Genetics was established in 2003. The major research interests in this department are genetic and epigenetic factors that may influence fertility, embryo development, and implantation, and bringing these research results to the clinical setting. Genetic factors leading to azoospermia, mutations leading to congenital agenesis of the vas deferens, preimplantation genetic testing (PGT), pharmacogenetics plus epigenetic and gene expression profiles of early embryogenesis are studied in this department.




### Goals

- Improving embryo implantation rates by PGT
- Assisting physicians with prescribing medicine for controlled ovarian stimulation via pharmacogenetics
- Genetic follow up of the newborns conceived by assisted reproductive technology (ART)
- Evaluating of candidate genes related to RSA in the Iranian population

### Main Activities

- Genetic counseling
- Lymphocyte karyotyping
- Karyotyping the stem cell lines following various manipulations
- PGT
- Producing recombinant proteins in collaboration with Royan Biotechnology Center
- Molecular diagnostic tests including Y chromosomal micro deletions, certain mutations in candidate genes which may be related to the causes of abortions or failed ART

### Selected Articles (2021)

1. Hosseini, V., Kalantary-Charvadeh, A., Hajikarami, M., Fayyazpour, P., Rahbarghazi, R., Totonchi, M., Darabi, M. A **small molecule modulating monounsaturated fatty acids and Wnt signaling confers maintenance to induced luripotent stem cells against endodermal differentiation** (2021) Stem Cell Research and Therapy, 12 (1), art. no. 550.

2. Salehi, N., Karimi-Jafari, M.H., Totonchi, M., Amiri-Yekta, A. **Integration and gene co-expression network analysis of scRNA-seq transcriptomes reveal heterogeneity and key functional genes in human spermatogenesis** (2021) Scientific Reports, 11 (1), art. no. 19089.

3. Esfandiari, F., Chitsazian, F., Jahromi, M.G., Favaedi, R., Bazrgar, M., Aflatoonian, R., Afsharian, P., Aflatoonian, A., Shahhoseini, M. **HOX cluster and their cofactors showed an altered expression pattern in eutopic and ectopic endometriosis tissues** (2021) Reproductive Biology and Endocrinology, 19 (1), art. no. 132.
4. Es, H.A., Mahdizadeh, H., Asl, A.A.H., Totonchi, M. **Genomic alterations and possible druggable mutations in carcinoma of unknown primary (CUP)** (2021) Scientific Reports, 11 (1), art. no. 15112.

5. Emami, N., Moini, A., Yaghmaei, P., Akbarinejad, V., Shahhoseini, M., Alizadeh, A.R. **Differences in expression of**

**genes related to steroidgenesis in abdominal subcutaneous adipose tissue of pregnant women with and without COS; a case control study** (2021) BMC Pregnancy and Childbirth, 21 (1), art. no. 490.

6. Pirjani, R., Moini, A., Heshmati, J., Mardi-Mamaghani, A., Esmaeili, M., Shafaatdoost, M., Maleki-Hajiagha, A., Karimi, E., Hossein-boroujerdi, M., Shokri, F., Mosanezhad, Z., Bajool, N., Noori, M., Hosseini, L., Persad, E., Sepidarkish, M. **Mothers and their children's health (MATCH): a study protocol for a population - based longitudinal cohort** (2021) BMC Pregnancy and Childbirth, 21 (1), art. no. 297.

7. Ranjbari, S., Khatibi, T., Vosough Dizaji, A., Sajadi, H., Totonchi, M., Ghaffari, F. **CNFE-SE: a novel approach combining complex network-based feature engineering and stacked ensemble to predict the success of intrauterine insemination and ranking the features** (2021) BMC Medical Informatics and Decision Making, 21 (1), art. no. 1.

8. Fatemi, N., Salehi, N., Pignata, L., Palumbo, P., Cubellis, M.V., Ramazanali, F., Ray, P., Varkiani, M., Reyhani-Sabet, F., Biglari, A., Sparago, A., Acurzio, B., Palumbo, O., Carella, M., Riccio, A., Totonchi, M. **Biallelic variant in cyclin B3 is associated with failure of maternal meiosis II and recurrent digynic triploidy** (2021) Journal of Medical Genetics, 58 (11), pp. 783-788.

9. Shabani, M., Totonchi, M., Rezaeimirghaed, O., Gachkar, L., Hajiesmaeili, M., Khoshkar, A., Amirdosara, M., affaei, A., Shokouhi, S., Mardani, M., Alavi Darazam, I., Karami, A., Sharifi, M., Zaman, M., Abedheydari, E., ahraei, Z. **Evaluation of the prophylactic effect of hydroxychloroquine on people in close-contact with patients with COVID-19** (2021) Pulmonary Pharmacology and Therapeutics, 70, art. no. 102069.

10. Shen, Q., Martinez, G., Liu, H., Beurois, J., Wu, H., Amiri-Yekta, A., Liang, D., Kherraf, Z.-E., Bidart, M., Cazin, C., Celse, T., Satre, V., Thierry-Mieg, N., Whitfield, M., Touré, A., Song, B., Lv, M., Li, K., Liu, C., Tao, F., He, X., Zhang, F., Arnoult, C., Ray, P.F., Cao, Y., Coutton, C. **Bi-allelic truncating variants in CFAP206 cause male infertility in human and mouse** (2021) Human Genetics, 140 (9), pp. 1367-1377.

11. Yari, S., Khoei, H.H., Saber, M., Esfandiari, F., Moini, A., Shahhoseini, M. **Metformin attenuates expression of angiogenic and inflammatory genes in human endometriotic stromal cells** (2021) Experimental Cell Research, 404 (2), art. no. 112659.

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22. Mahdian, S., Pirjani, R., Favaedi, R., Movahedi, M., Moini, A., Shahhoseini, M. **Platelet-activating factor and antiphospholipid antibodies in recurrent implantation failure** (2021) Journal of Reproductive Immunology, 143, art. no. 103251.

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25. Sadeghi, H., Kamal, A., Ahmadi, M., Najafi, H., Sharifi Zarchi, A., Haddad, P., Shayestehpour, B., Kamkar, L., Salamati, M., Geranpayeh, L., Lashkari, M., Totonchi, M. **A novel panel of blood-based microRNAs capable of discrimination between benign breast disease and breast cancer at early stages** (2021) RNA Biology. Article in Press

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28. Esfandiari, F., Favaedi, R., Heidari-Khoei, H., Chitsazian, F., Yari, S., Piryaei, A., Ghafari, F., Baharvand, H., Shahhoseini, M. **Insight into epigenetics of human endometriosis organoids: DNA methylation analysis of HOX genes and their cofactors** (2021) Fertility and Sterility, 115 (1), pp. 125-137.

## Reproductive Imaging Department

### Introduction

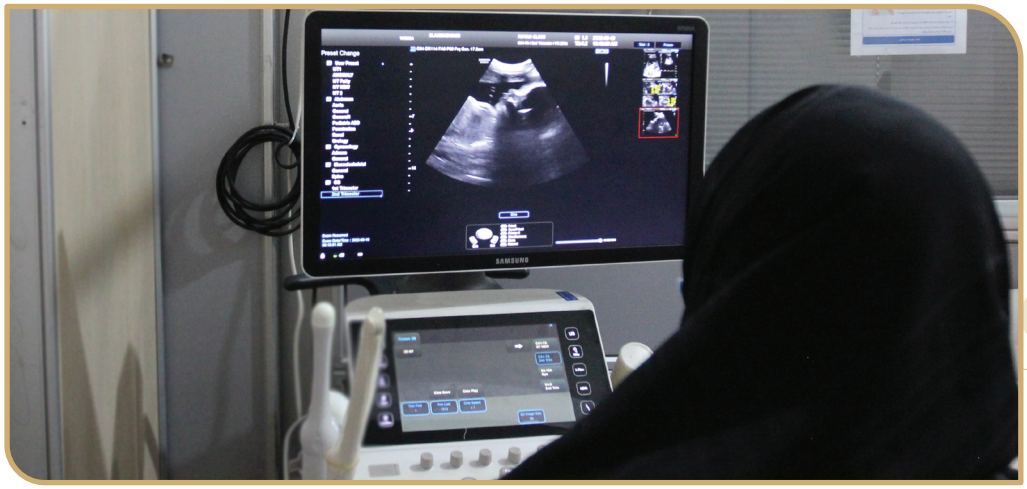
Reproductive Imaging Department was established in 2012 to focus on infertility assessment and obstetric care as well as evaluation of pregnancies. Imaging techniques such as hysterosalpingography and three-dimensional hysonosterography which are performed in this department, have been significant breakthroughs in the diagnosis and management of infertility.

## Goals

- Expanding clinical and fundamental research in reproductive imaging
- Providing modern strategies and improving clinical services for infertile couples

## Main Activities

- Making Diagnostic accuracy investigation of imaging modalities (hysterosalpingography, hysterosonography and three-dimensional ultrasound)
- Fetal screening
- Defining standards for ultrasound measurement charts appropriate to Iranian fetuses
- Providing the educational courses in diagnostic ultrasound techniques for andrology and female infertility fellowships



## Selected Articles (2021)


1. Mashayekhi, M., Mirzadeh, E., Chekini, Z., Ahmadi, F., Eftekhari-Yazdi, P., Vesali, S., Madani, T., Aghdami, N. **Evaluation of safety, feasibility and efficacy of intra-ovarian transplantation of autologous adipose derived esenchymal stromal cells in idiopathic premature ovarian failure patients: non-randomized clinical trial, phase I, first in human** (2021) Journal of Ovarian Research, 14 (1), art. no. 5.

2. Ranjbari, S., Khatibi, T., Vosough Dizaji, A., Sajadi, H., Totonchi, M., Ghaffari, F. **CNFE-SE: a novel approach combining complex network-based feature engineering and stacked ensemble to predict the success of intrauterine insemination and ranking the features** (2021) BMC Medical Informatics and Decision Making, 21 (1), art. no. 1.

3. Zafarani, F., Ghaffari, F., Ahmadi, F., Mehranjani, M.S., Shahrzad, G. **Hysterosalpingography in the assessment of proximal tubal pathology: A review of congenital and acquired abnormalities** (2021) British Journal of Radiology, 94 (1122), art. no. 20201386.

4. Montazeri, L., Mohajeri, M., Baharvand, H., Fathi, R., Poli, V., Kazemi, S., Pahlavan, F., Kouhestani, S., Ahmadi, F., Mowla, S.J. **Two leading international congresses in Iran in the era of COVID-19: 21st royan international twin congress, 4th international and 16th Iranian genetics congress** (2021) BioEssays, 43 (6), art. no. 2100078.

5. Ahmadi, F., Hosseini, F., Javam, M., Pahlavan, F. **Hysterosalpingography findings of leiomyomas and how they look in artistic eyes: New diagnostic sign**s (2021) British Journal of Radiology, 94 (1121), art. no. 20200019.

6. Sadeghi, H., Kamal, A., Ahmadi, M., Najafi, H., Sharifi Zarchi, A., Haddad, P., Shayestehpour, B., Kamkar, L., Salamati, M., Geranpayeh, L., Lashkari, M., Totonchi, M. A **novel panel of blood-based microRNAs capable of discrimination between benign breast disease and breast cancer at early stages** (2021) RNA Biology. Article in Press.

## Royan Institute for Stem Cell Biology and Technology

Royan Institute for Stem Cell Biology and Technology (RI-SCBT), formerly known as the Department of Stem Cells was first established in 2002 to promote research on general stem cell biology in Iran. Thereafter, the Department of Stem Cells was promoted to the Institute for Stem Cell biology and Technology which included three departments with multiple research groups that conduct studies on stem cells and developmental biology, regenerative medicine, personalized medicine, cancer medicine, biomedical engineering, and the brain and cognitive sciences. The institute is committed to cross-disciplinary partnerships and collaborations with biologists, engineers, and medical academics to improve health by providing a comprehensive and coordinated "bench to bedside" approach. Currently, the institute departments are:

- Department of Stem cells and Developmental Biology
- Department of Cell Engineering
- Department of Regenerative Medicine

Moreover, there are two initiatives in which principal investigators collaborate to perform research in Cancer Medicine and Biodiscovery.

Both basic research and clinical departments provide significant opportunities for science development and translational research.

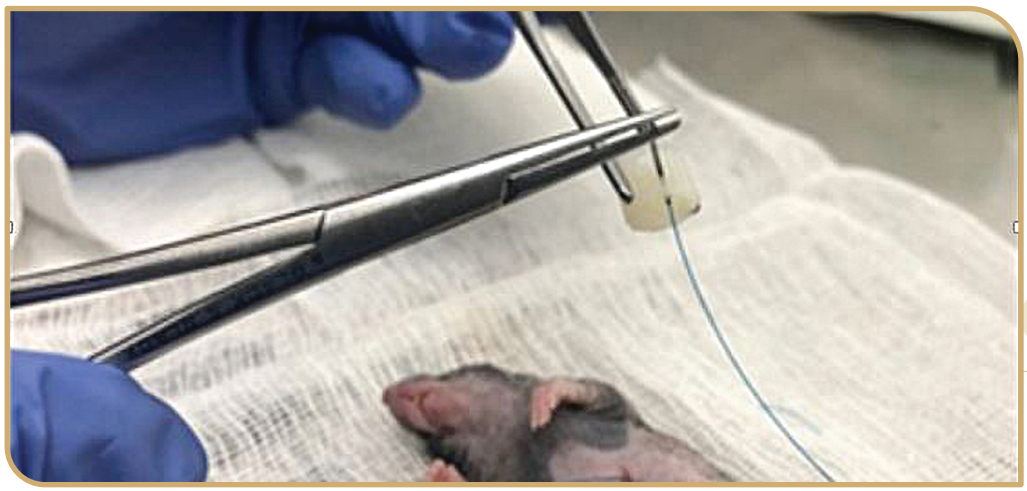
The vision of RI-SCBT is to efficiently translate stem cell research findings into application in treatment of disorders with the aim of improving health. The mission of RI-SCBT is to generate insights into the biology of stem cells through basic research and to provide the foundation needed for novel therapies by means of regenerative medicine.
Beside research for understanding the fundamentals of stem cells biology with "bench to bedside" approach, this institute tries to do translational research on experimental models and clinical trials in collaboration with other clinical research centers.

RI-SCBT is a member of three international initiatives including: Stem Cell Genomic Instability Initiative, AOHUPO Human Embryonic Stem Cell Membrane Proteome Initiative, and Human proteome project in which Royan Institute studies on chromosome Y (in collaboration with Royan Institute for Reproductive Biomedicine).

### Department of Stem Cells and Developmental Biology

#### Introduction

This department was established in 2002 providing a platform for interactions between researchers interested in the biology of stem cells, differentiation and regeneration.



#### Goals

Gain knowledge as well as translation of science in the following disciplines:

- Stem cells

- Stem Cells differentiationTransdifferentiation of somatic cells to each other
- Producing transgenic mice through manipulating embryonic stem cells

## Main Activities

Studying on:

- Stem cells and developmental biology (including pluripotent stem cells [embryonic and induced] and Adult stem cells)
- Stem cell studies in the fields of nervous system, cardiovascular system, gastrointestinal tract, liver, kidney, pancreas, hair and skin
- Hematopoietic stem cells and Cancer stem cells
- Reprogramming and gene targeting

## Selected Articles (2021)


1. Hosseini, V., Kalantary-Charvadeh, A., Hajikarami, M., Fayyazpour, P., Rahbarghazi, R., Totonchi, M., Darabi, M. **A small molecule modulating monounsaturated fatty acids and Wnt signaling confers maintenance to induced luripotent stem cells against endodermal differentiation** (2021) Stem Cell Research and Therapy, 12 (1), art. no. 550.

2. Babazadeh, S., Nassiri, S.M., Siavashi, V., Sahlabadi, M., Hajinasrollah, M., Zamani-Ahmadmahmudi, M. **Macrophage polarization by MSC-derived CXCL12 determines tumor growth** (2021) Cellular and Molecular Biology Letters, 26 (1), art. no. 30.

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4. Gholami, S., Zarkesh, I., Ghanian, M.-H., Hajizadeh-Saffar, E., Hassan-Aghaei, F., Mohebi, M.-M., Baharvand, H. **Dynamically capped hierarchically porous microneedles enable post-fabrication loading and self-regulated transdermal delivery of insulin** (2021) Chemical Engineering Journal, 421, art. no. 127823 .

5. Solhi, R., Lotfinia, M., Gramignoli, R., Najimi, M., Vosough, M. **Metabolic hallmarks of liver regeneration** (2021) Trends in Endocrinology and Metabolism, 32 (9), pp. 731-745.

6. Baei, P., Daemi, H., Mostafaei, F., Azam Sayahpour, F., Baharvand, H., Baghaban Eslaminejad, M. **A tough polysaccharide-based cell-laden double-network hydrogel promotes articular cartilage tissue regeneration in rabbits** (2021) Chemical Engineering Journal, 418, art. no. 129277.

7. Moradi, S., Jarrahi, E., Ahmadi, A., Salimian, J., Karimi, M., Zarei, A., Azimzadeh Jamalkandi, S., Ghanei, M. **PI3K signalling in chronic obstructive pulmonary disease and opportunities for therapy** (2021) Journal of Pathology, 254 (5), pp. 505-518.

8. Radmanesh, F., Sadeghi Abandansari, H., Ghanian, M.H., Pahlavan, S., Varzideh, F., Yakhkeshi, S., Alikhani, M., Moradi, S., Braun, T., Baharvand, H. **Hydrogel-mediated delivery of microRNA-92a inhibitor polyplex nanoparticles induces localized angiogenesis** (2021) Angiogenesis, 24 (3), pp. 657-676.

9. Kamali, A., Oryan, A., Hosseini, S., Ghanian, M.H., Alizadeh, M., Eslaminejad, M.B., Baharvand, H. **Corrigendum to "Cannabidiol-loaded microspheres incorporated into osteoconductive scaffold enhance mesenchymal stem cell recruitment and regeneration of critical-sized bone defects"** (2021) Materials Science and Engineering C, 126, art. no. 112179.

10. Akhoundi, M., Mohammadi, M., Sahraei, S.S., Sheykhhasan, M., Fayazi, N. **CAR T cell therapy as a promising approach in cancer immunotherapy: challenges and opportunities** (2021) Cellular Oncology, 44 (3), pp. 495-523.

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13. Khani, A.T., Sharifzad, F., Mardpour, S., Hassan, Z.M., Ebrahimi, M. **Tumor extracellular vesicles loaded with exogenous Let-7i and miR-142 can modulate both immune response and tumor microenvironment to initiate a powerful anti-tumor response** (2021) Cancer Letters, 501, pp. 200-209.

14. Ranjbarvaziri, S., Kiani, S., Akhlaghi, A., Vosough, A., Baharvand, H., Aghdami, N. **Corrigendum to "Quantum dot labeling using positive charged peptides in human hematopoetic and mesenchymal stem cells"** (2021) Biomaterials, 270, art. no. 120691 .

15. Agarwal, T., Kazemi, S., Costantini, M., Perfeito, F., Correia, C.R., Gaspar, V., Montazeri, L., De Maria, C., Mano, J.F., Vosough, M., Makvandi, P., Maiti, T.K. **Oxygen releasing materials: Towards addressing the hypoxia-related issues in tissue engineering** (2021) Materials Science and Engineering C, 122, art. no. 111896 .

16. Asadi-Korayem, M., Akbari-Taemeh, M., Mohammadian-Sabet, F., Shayesteh, A., Daemi, H. **How does counter-cation substitution influence inter- and intramolecular hydrogen bonding and electrospinnability of alginates** (2021) International Journal of Biological Macromolecules, 171, pp. 234-241.

17. Montazeri, L., Kowsari-Esfahan, R., Pahlavan, S., Sobat, M., Rabbani, S., Ansari, H., Varzideh, F., Barekat, M., Rajabi, S., Navaee, F., Bonakdar, S., Renaud, P., Braun, T., Baharvand, H. **Oxygen-rich Environment Ameliorates Cell Therapy Outcomes of Cardiac Progenitor Cells for Myocardial Infarction** (2021) Materials Science and Engineering C, 121, art. no. 111836 .

18. Yazdian Kashani, S., Keshavarz Moraveji, M., Taghipoor, M., Kowsari-Esfahan, R., Hosseini, A.A., Montazeri, L., Dehghan, M.M., Gholami, H., Farzad-Mohajeri, S., Mehrjoo, M., Majidi, M., Renaud, P., Bonakdar, S. **An integrated microfluidic device for stem cell differentiation based on cell-imprinted substrate designed for cartilage regeneration in a rabbit model** (2021) Materials Science and Engineering C, 121, art. no. 111794 .

19. Ahmadabad, L.E., Kalantari, F.S., Liu, H., Hasan, A., Gamasaee, N.A., Edis, Z., Attar, F., Ale-Ebrahim, M., Rouhollah, F., Babadaei, M.M.N., Sharifi, M., Shahpasand, K., Akhtari, K., Falahati, M., Cai, Y. **Hydrothermal method-based synthesized tin oxide nanoparticles: Albumin binding and antiproliferative activity against K562 cells** (2021) Materials Science and Engineering C, 119, art. no. 111649.

20. Bayati, F., Mohammadi, M., Valadi, M., Jamshidi, S., Foma, A.M., Sharif-Paghaleh, E. **The Therapeutic Potential of Regulatory T Cells: Challenges and Opportunities** (2021) Frontiers in Immunology, 11, art. no. 585819 .

21. Akhlaghpour, A., Taei, A., Ghadami, S.A., Bahadori, Z., Yakhkeshi, S., Molamohammadi, S., Kiani, T., Samadian, A., Ghezelayagh, Z., Haghparast, N., Khalooghi, K., Braun, T., Baharvand, H., Hassani, S.-N. **Chicken Interspecies Chimerism Unveils Human Pluripotency** (2021) Stem Cell Reports, 16 (1), pp. 39-55.

22. Magalhaes, J., Tresse, E., Ejlerskov, P., Hu, E., Liu, Y., Marin, A., Montalant, A., Satriano, L., Rundsten, C.F., Carlsen, E.M.M., Rydbirk, R., Sharifi-Zarchi, A., Andersen, J.B., Aznar, S., Brudek, T., Khodosevich, K., Prinz, M., Perrier, J.-F.M., Sharma, M., Gasser, T., Issazadeh-Navikas, S. **PIAS2-mediated blockade of IFN-$\beta$ signaling: a basis for sporadic Parkinson disease dementia** (2021) Molecular Psychiatry . Article in Press

23. Esfandiari, F., Favaedi, R., Heidari-Khoei, H., Chitsazian, F., Yari, S., Piryaei, A., Ghafari, F., Baharvand, H., Shahhoseini, M. **Insight into epigenetics of human endometriosis organoids: DNA methylation analysis of HOX genes and their cofactors** (2021) Fertility and Sterility, 115 (1), pp. 125-137.

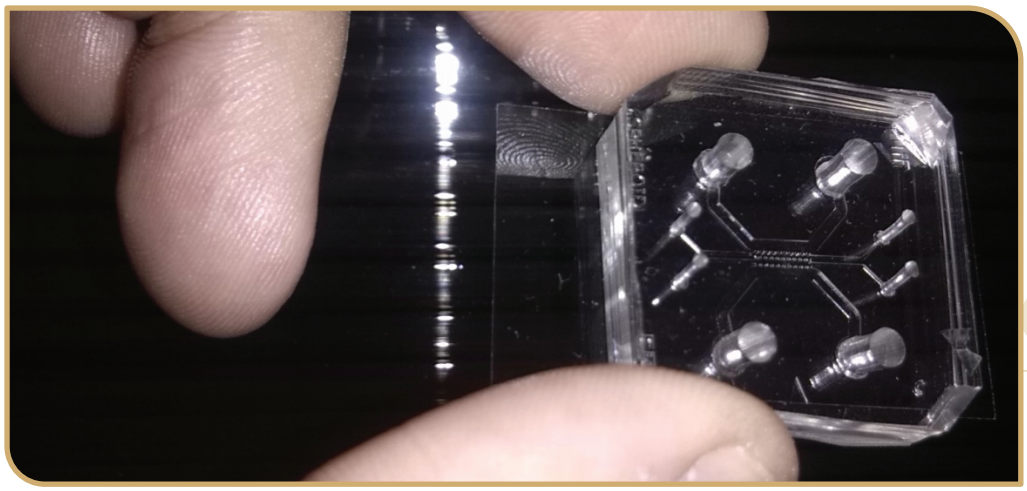
24. Meyfour, A., Pahlavan, S., Mirzaei, M., Krijgsveld, J., Baharvand, H., Salekdeh, G.H. **The quest of cell surface markers for stem cell therapy** (2021) Cellular and Molecular Life Sciences, 78 (2), pp. 469-495.

25. Esmaeili, A., Hosseini, S., Baghaban Eslaminejad, M. **Engineered-extracellular vesicles as an optimistic tool for microRNA delivery for osteoarthritis treatment** (2021) Cellular and Molecular Life Sciences, 78 (1), pp. 79-91.

## Department of Cell Engineering

### Introduction

This department was established in 2016 with aim to provide a multidisciplinary environment for collaboration of biologists, engineers, chemists and physicists.



### Goals

- Material designing for culture and differentiation of stem cells
- Designing cell/drug delivery systems for regenerative medicine
- Bioprocess engineering in large scale cell production
- Establishment of bioengineering platforms for drug screening and disease diagnosis

### Main Activities

Studying on the following fields:

- Surface modification
- Bioprocess and bioreactors
- Microfluidics
- Biological and chemical Cell/Drug Delivery systems
- Bioprinting

### Selected Articles (2021)

1. Ghezelayagh, Z., Zabihi, M., Kazemi Ashtiani, M., Ghezelayagh, Z., Lynn, F.C., Tahamtani, Y. **Recapitulating pancreatic cell–cell interactions through bioengineering approaches: the momentous role of non-epithelial cells for diabetes cell therapy** (2021) Cellular and Molecular Life Sciences, 78 (23), pp. 7107-7132.

2. Gholami, S., Zarkesh, I., Ghanian, M.-H., Hajizadeh-Saffar, E., Hassan-Aghaei, F., Mohebi, M.-M., Baharvand, H. **Dynamically capped hierarchically porous microneedles enable post-fabrication loading and self-regulated ransdermal delivery of insulin** (2021) Chemical Engineering Journal, 421, art. no. 127823.

3. Gholami, S., Mohebi, M.-M., Hajizadeh-Saffar, E., Ghanian, M.-H., Zarkesh, I., Baharvand, H. **Corrigendum to "Fabrication of microporous inorganic microneedles by centrifugal casting method for transdermal extraction and delivery** (2021) International Journal of Pharmaceutics, 606, art. no. 120890.

4. Hasanzadeh, A., Radmanesh, F., Hosseini, E.S., Hashemzadeh, I., Kiani, J., Nourizadeh, H., Naseri, M., Fatahi, Y., Chegini, F., Madjd, Z., Beyzavi, A., Kowalski, P.S., Karimi, M. **Highly Photoluminescent Nitrogen- And Zinc-oped Carbon Dots for Efficient Delivery of CRISPR/Cas9 and mRNA** (2021) Bioconjugate Chemistry, 32 (8), pp. 1875-1887.

5. Sadeghi-Abandansari, H., Pakian, S., Nabid, M.-R., Ebrahimi, M., Rezalotfi, A. **Local co-delivery of 5-fluorouracil and curcumin using Schiff's base cross-linked injectable hydrogels for colorectal cancer combination therapy**(2021) European Polymer Journal, 157, art. no. 110646.

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7. Hasanzadeh, A., Radmanesh, F., Hosseini, E.S., Hashemzadeh, I., Kiani, J., Naseri, M., Nourizadeh, H., Fatahi, Y., Azar, B.K.Y., Marani, B.G., Beyzavi, A., Mahabadi, V.P., Karimi, M. **Synthesis and characterization of vitamin D3-functionalized carbon dots for CRISPR/Cas9 delivery** (2021) Nanomedicine, 16 (19), pp. 1673-1690.

8. Radmanesh, F., Sadeghi Abandansari, H., Ghanian, M.H., Pahlavan, S., Varzideh, F., Yakhkeshi, S., Alikhani, M., Moradi, S., Braun, T., Baharvand, H. **Hydrogel-mediated delivery of microRNA-92a inhibitor polyplex nanoparticles induces localized angiogenesis** (2021) Angiogenesis, 24 (3), pp. 657-676.

9. Sahraro, M., Barikani, M., Daemi, H., Baei, P. **Anti-fatigue, highly resilient photocrosslinkable gellan gum hydrogels reinforced by flexible nanoparticulate polyurethane multi-crosslinkers** (2021) International Journal of Biological Macromolecules, 183, pp. 831-838.

10. Kamali, A., Oryan, A., Hosseini, S., Ghanian, M.H., Alizadeh, M., Eslaminejad, M.B., Baharvand, H. **Corrigendum to "Cannabidiol-loaded microspheres incorporated into osteoconductive scaffold enhance mesenchymal stem cell ecruitment and regeneration of critical-sized bone defectspages** (2021) Materials Science and Engineering C, 126, pp 64–5.

11. Zahmatkesh, E., Ghanian, M.H., Zarkesh, I., Farzaneh, Z., Halvaei, M., Heydari, Z., Moienvaziri, F., Othman, A., Ruoß, M., Piryaei, A., Gramignoli, R., Yakhkeshi, S., Nüssler, A., Najimi, M., Baharvand, H., Vosough, M. **Tissue-specific microparticles improve organoid microenvironment for efficient maturation of pluripotent stem-cell-derived hepatocytes** (2021) Cells, 10 (6), art. no. 1274.

12. Shams, Z., Akbari, B., Rajabi, S., Aghdami, N. **Bioinspired device improves the cardiogenic potential of cardiac progenitor cells** (2021) Cell Journal, 23 (1), pp. 129-136.

13. Mostafavi, A., Daemi, H., Rajabi, S., Baharvand, H. **Highly tough and ultrafast self-healable dual physically crosslinked sulfated alginate-based polyurethane elastomers for vascular tissue engineering** (2021) Carbohydrate Polymers, 257, art. no. 117632.

14. Agarwal, T., Kazemi, S., Costantini, M., Perfeito, F., Correia, C.R., Gaspar, V., Montazeri, L., De Maria, C., Mano, J.F., Vosough, M., Makvandi, P., Maiti, T.K. **Oxygen releasing materials: Towards addressing the hypoxia-related issues in tissue engineering** (2021) Materials Science and Engineering C, 122, art. no. 111896.

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Azarpazhooh, A., Kishen, A. **Human amniotic membrane extracellular matrix scaffold for dental pulp regeneration in vitro and in vivo** (2021) International Endodontic Journal, Article in Press.

19. Ghezelayagh, Z., Zabihi, M., Zarkesh, I., Gonçalves, C.A.C., Larsen, M., Hagh-parast, N., Pakzad, M., Vosough, M., Arjmand, B., Baharvand, H., Larijani, B., Grapin-Botton, A., Aghayan, H.R., Tahamtani, Y. **Improved ifferentiation of hESC-Derived Pancreatic Progenitors by Using Human Fetal Pancreatic Mesenchymal Cells in a Micro - scalable Three-Dimensional Co-culture System** (2021) Stem Cell Reviews and Reports, . Article in Press.

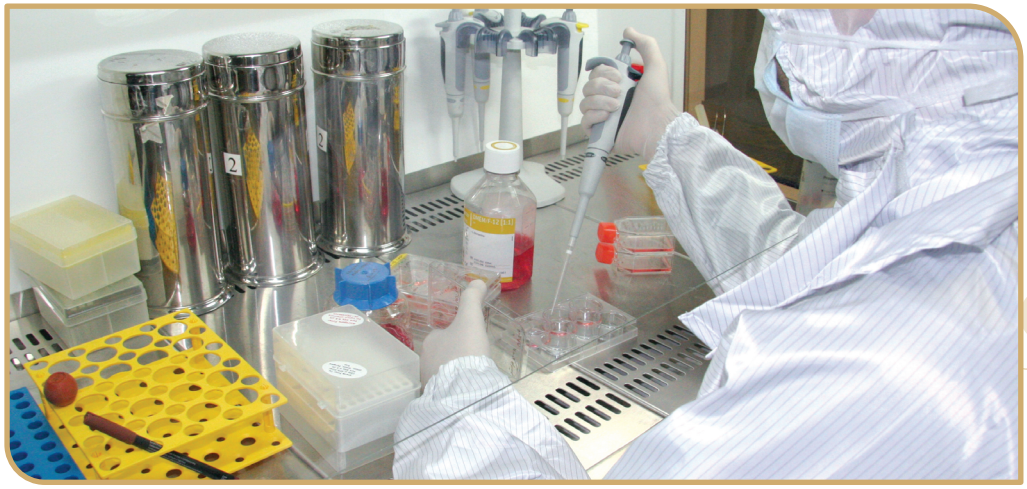
20. Moeinvaziri, F., Zarkesh, I., Pooyan, P., Nunez, D.A., Baharvand, H. **Inner ear organoids: progress and outlook, with a focus on the vascularization** (2021) FEBS Journal. Article in Press.

21. Esmaeili, A., Hosseini, S., Baghaban Eslaminejad, M. **Engineered-extracellular vesicles as an optimistic tool for microRNA delivery for osteoarthritis treatment** (2021) Cellular and Molecular Life Sciences, 78 (1), pp. 79-91.

## Department of Regenerative Medicine

### Introduction

Regenerative Medicine Department was established in 2011. The medical researchers are dedicated to delivering the state-of-the-art clinical care and bringing the advancement of Stem Cell research to regenerative medicine. The most significant activities of this department is running the clinical trials to evaluate the safety and efficacy of cell therapy in some diseases such as skin diseases, brain tumors and osteoarthritis.



### Goals

- Studying cell-based therapies
- Achieving technologies to relieve human suffering from chronic and degenerative disorders

**Main Activities**

Enrolling the different clinical trials in

- Bone and cartilage diseases (e.g. Osteoarthritis)
- Skin diseases (e.g. Vitiligo)
- Cardiovascular diseases (e.g. Myocardial Infarction)
- CNS diseases (e.g. Cerebral Palsy)
- Eye diseases (e.g. Limbal Stem Cell Deficiency)
- Liver and gastrointestinal diseases (e.g. Cirrhosis)
- Kidney diseases (e.g. Chronic Kidney Disease)
- Diabetes mellitus
- Infertility (e.g. Premature Ovarian Failure)

The clinical trials are conducted in close collaboration with many hospitals in different cities in Iran to improve the quality of human life.

## Selected Articles (2021)


1. Dashti, F., Mirazimi, S.M.A., Rabiei, N., Fathazam, R., Rabiei, N., Piroozmand, H., Vosough, M., Rahimian, N., Hamblin, M.R., Mirzaei, H. **The role of non-coding RNAs in chemotherapy for gastrointestinal cancers** (2021) Molecular Therapy - Nucleic Acids, 26, pp. 892-926.

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8. Hashemian, S.-M.R., Aliannejad, R., Zarrabi, M., Soleimani, M., Vosough, M., Hosseini, S.-E., Hossieni, H., Keshel, S.H., Naderpour, Z., Hajizadeh-Saffar, E., Shajareh, E., Jamaati, H., Soufi-Zomorrod, M., Khavandgar, N., Alemi, H., Karimi, A., Pak, N., Rouzbahani, N.H., Nouri, M., Sorouri, M., Kashani, L., Madani, H., Aghdami, N., Vasei, M., Baharvand, H. **Mesenchymal stem cells derived from perinatal tissues for treatment of critically ill COVID-19-induced ARDS patients: a case series** (2021) Stem Cell Research and Therapy, 12 (1), art. no. 91.

9. Keshavarz Alikhani, H., Shokoohian, B., Rezasoltani, S., Hossein-khannazer, N., Yadegar, A., Hassan, M., Vosough, M. **Application of Stem Cell-Derived Extracellular Vesicles as an Innovative Theranostics in Microbial Diseases** (2021) Frontiers in Microbiology, 12, art. no. 785856.

10. Uccelli, A., Laroni, A., Ali, R., Battaglia, M.A., Blinkenberg, M., Brundin, L., Clanet, M., Fernandez, O., Marriot, J., Muraro, P., Nabavi, S.M., Oliveri, R.S., Radue, E., Ramo Tello, C., Schiavetti, I., Sellner, J., Sorensen, P.S., Sormani, M.P., Wuerfel, J.T., Freedman, M.S. **MESEMS investigators Safety, tolerability, and activity of mesenchymal stem cells versus placebo in multiple sclerosis (MESEMS): a phase 2, randomised, double-blind crossover trial** (2021) The Lancet Neurology, 20 (11), pp. 917-929.

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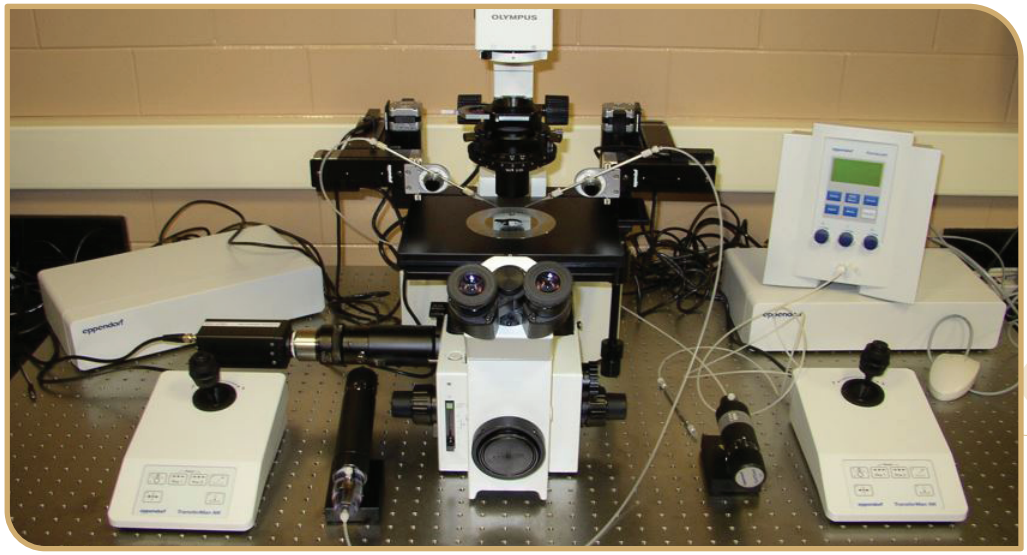
# Royan Institute for Developmental Biotechnology

Royan Institute for Developmental Biotechnology (RI-DB) was initially established in 2004 as a research sub-institute that is located in Isfahan Province. The endeavors of RI-DB have made Royan Institute the pioneer of animal cloning in Iran and the Middle East. Coming up with the first cloned sheep in the Middle East in 2006 placed Iran among the few countries having this technology. Making use of this technology in producing transgenic animals has led to bringing the goats into being in Isfahan and Tehran (2009) with the ability to secrete human coagulation factor 9 and human Tissue Plasmogene Activator (hTPA) in their milk.
The vision of RI-DB is to achieve high standards in biotechnology research, and to make biotechnology as a premier precision tool for future health development.
RI-DB includes Animal Biotechnology department, three research groups and four laboratories.

## Departmant of Animal Biotechnology

### Introduction

This department consitists of three groups and four laboratories including: Cellular Biotechnology, Molecular Biotechnology and Reproductive Biotechnology groups. Genetic, Stem Cell, Andrology and Embryology laboratories.




### Goals

- Cloning farm animals with high genetic potential
- Applying ART in farm animals
- Improving sperm selection methods for ART
- "Bench to production" approach in animal farming

### Main Activities

- Somatic cell nuclear technology (SCNT), interspecies-SCNT, transgenesis,
- Establishment of novel sperm selection methods for ART
- Establishment of methods to increase the efficiency of ART in animals

### Selected Articles (2021)

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10. Zaker, S.R., Ghaedi, K. **Downregulation of LINC02615 is correlated with the breast cancer progress: A novel biomarker for differential identification of breast cancer tissues** (2021) Cell Journal, 23 (4), pp. 414-420.

11. Hezavehei, M., Shokoohian, B., Nasr-Esfahani, M.H., Shpichka, A., Timashev, P., Shahverdi, A., osough, M. **Possible male reproduction complications after Coronavirus pandemic** (2021) Cell Journal, 23 (4), pp. 382-388.

12. Rashidi, M., Tavalaee, M., Abbasi, H., Nomikos, M., Nasr-Esfahani, M.H. **Increased de novo DNA methylation enzymes in sperm of individuals with varicocele** (2021) Cell Journal, 23 (4), pp. 389-396.

13. Motiei, M., Aboutalebi, F., Forouzanfar, M., Dormiani, K., Nasr-Esfahani, M.H., Mirahmadi-Zare, S.Z. **Smart co-delivery of miR-34a and cytotoxic peptides (LTX-315 and melittin) by chitosan based polyelectrolyte nanocarriers for specific cancer cell death induction** (2021) Materials Science and Engineering C, 128, art. no. 112258.

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34. Rezaeian, A. **Methylation status of MTHFR promoter and oligozoospermia risk: An epigenetic study and in silico analysis**(2021) Cell Journal, 22 (4), pp. 482-490.

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36. Mirhaj, M., Tavakoli, M., Varshosaz, J., Labbaf, S., Jafarpour, F., Ahmaditabar, P., Salehi, S., Kazemi, N. **Platelet rich fibrin containing nanofibrous dressing for wound healing application: Fabrication, characterization and biological evaluations** (2021) Materials Science and Engineering C, art. no. 112541.

37. Jeyhani, N., Masaeli, E., Mirahmadi-Zare, S.Z., Alirezaei, S., Shoaraye-Nejati, A. **Effect of precursor on structural and antibacterial behaviour of hydroxyapatite/silver nanocomposites** (2021) Materials Technology.

38. Rahmani, M., Tavalaee, M., Hosseini, M., Eskandari, A., Shaygannia, E., Sadeghi, N., Nazem, M.N., Gharagozloo, P., Drevet, J.R., Nasr-Esfahani, M.H. **Deferasirox, an Iron-Chelating Agent, Improves Testicular Morphometric and Sperm Functional Parameters in a Rat Model of Varicocele** (2021) Oxidative Medicine and Cellular Longevity, 2021, art. no. 6698482.

39. Fanaee, S., Labbaf, S., Enayati, M.H., Karamali, F., Esfahani, M.-H.N. **A nano approach towards the creation of a biointerface as stimulator of osteogenic differentiation** (2021) Materials Science and Engineering C, 120, art. no. 111746.

## Research Center for Basic and Population Based Studies in Non-Communicable Diseases

According to the latest report from the International Diabetes Federation, there are currently 463 million people with diabetes worldwide, half of whom are undiagnosed. It is also estimated that in the next 15 years, the global prevalence will increase to 700 million people. Iran is considered the third country in the region with an adult population (age 20-79) of more than 5 million people with diabetes.
In 1980 the global obesity prevalence was reported 29% which risen to 37% in 2013. In Iran, over 25 million people are overweight (63% of adult population). Moreover, 30% of the country's children population are considered overweight. Currently there are one million obese people in the country and it is anticipated that there will be a rapid escalation of obesity in Iran over the next few years.
Taken together, these health concerns make a great challenge and considerable economic burden on the country's healthcare system and the growing rate necessitates a systematic approach in all aspects of research, prevention and therapy.



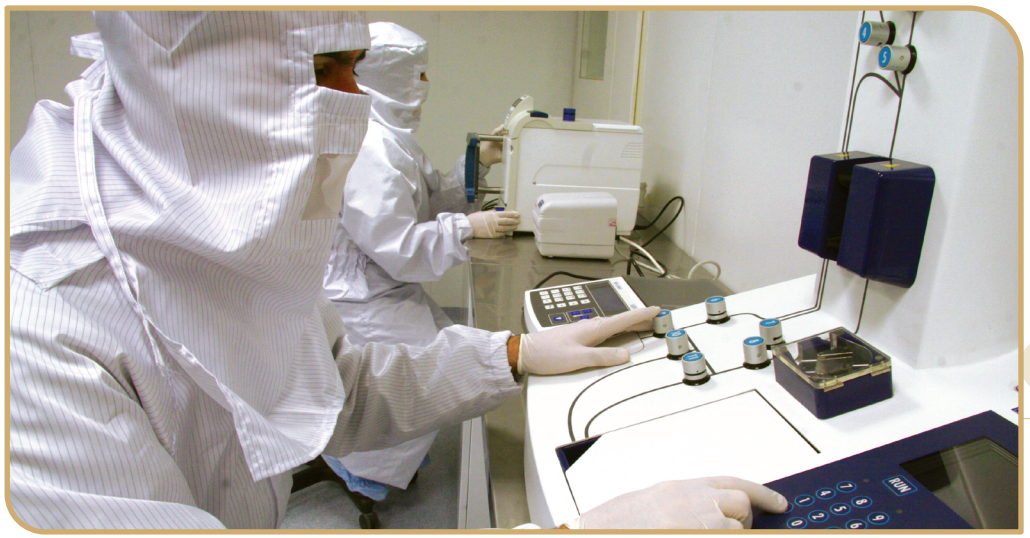
In Center for Basic and Population Based Studies in Non-Communicable Diseases (NCD) the researchers study on the following issues:

- Cell-based therapy research: development of stem cells and pancreatic islet transplantation technologies
- Biodiscovery and disease modeling: cell-based disease modeling, generation of transgenic animal models for diseases, natural compound discovery by high-throughput screenings to test on cell and animal models of disease
- Clinical and epidemiological studies: designing epidemiological studies on the prevalence of obesity, diabetes and other endocrine diseases among juveniles and adults to find disease prevention methods; designing and running clinical trials for novel treatments in endocrine and metabolic diseases; conducting systematic reviews on subjects lacking scientific consensus

# Royan Applied Research Centers and Core Facilities

## Advanced Therapy Medicinal Product Technology Development Center

The Advanced Therapy Medicinal Product Technology Development Center (ATMP), founded in 2018, focuses on the design and implementation of the research and development of regenerative medicine products prior to the introduction of the cell product into the pharmaceutical market. In this regard, the production unit finds reliable cellular resources and checks the safety and efficacy of cellular products. In the quality control unit, they try to monitor the production of safe and efficient products in accordance with international standards. The quality assurance unit strictly monitors the documentation of all stages of production based on the defined protocols according to international standards.
The mission of the ATMP center is to create a reliable and efficient bridge between the laboratory and pre-clinical stages of regenerative medicine products to the treatment and industrial production of high-scale products.



## Royan Biotechnology Center

Royan Biotechnology Center (RBC) was founded in 2017 by pioneers in genetic engineering and biotechnology at Royan institute, Tehran-Iran. RBC is a provider of cell-based biotechnologies that are vital to the discovery and development of therapeutic proteins; such as monoclonal antibodies and difficult-to-express proteins, including Fc-fusion proteins, bi-specific monoclonal antibodies. This center can facilitate the production of virtually any recombinant protein as well.



## Laboratory Animal Science Core Facility

The Laboratory Animal Science Core Facility of Royan Institute plays a national role in education of scholars performing ground researches on experimental animals, by organizing proficient gadget in all categories within the animal research fields. Each center has three major activities:

- Maintenance and breeding the animals
- Creating animal models with surgical manipulations or chemical interactions
- Research and development in animal modeling

Scientists of this service unit facility who are responsible for the design of animal experiments have to be graduated in Veterinary Medicine or one of biomedical science fields and must have taken a course on laboratory animal science which concentrates on humane and gentle handling of animals. They also should be aware of knowledge of alternative routes and ethical aspects of animal experimentation.

Modern laboratory animal science builds on the three Rs of Russell & Burch:

- Replacement: Replace animal experiments with alternatives whenever possible.
- Reduction: Reduce the number of experiments and number of animals in each experiment to an absolute minimum
- Refinement: Refine experiments so that the animals undergo a minimum of discomfort

The primary aim of the Laboratory Animal Facility is to ensure that the three Rs are followed in practice.

### Goals

- Providing quality care for all animals used at Royan Institute
- Assisting researchers in their mission of quality research with respect to humane use of laboratory animals
- Providing researchers with a relevant education to enable them achieve scientific eminences in selected areas
- Producing, supporting and maintaining laboratory animals required for research
- Managing the animal care and having commitment to them
- Managing a preventive medicine program for disease control
- Advising research departments on all aspects of experimental use of animals, including experimental design, surgical, pre and post-operative care, oocyte and embryo harvesting, and experimental animal modeling establishment



### Selected Articles (2021)


1. Baei, P., Daemi, H., Mostafaei, F., Azam Sayahpour, F., Baharvand, H., Baghaban Eslaminejad, M. **A tough polysaccharide-based cell-laden double-network hydrogel promotes articular cartilage tissue regeneration in rabbits** (2021) Chemical Engineering Journal, 418, art. no. 129277.

2. Ahmadi, A., Moghadasali, R., Ezzatizadeh, V., Taghizadeh, Z., Nassiri, S.M., Asghari-Vostikolaee, M.H., Alikhani, M., Hadi, F., Rahbarghazi, R., Yazdi, R.S., Baharvand, H., Aghdami, N. **Retraction Note: Transplantation of Mouse Induced Pluripotent Stem Cell-Derived Podocytes in a Mouse Model of Membranous Nephropathy Attenuates Proteinuria** (2021) Scientific reports, 11 (1), p. 13831.

3. Navabi, R., Negahdari, B., Hajizadeh-Saffar, E., Hajinasrollah, M., Jenab, Y., Rabbani, S., Pakzad, M., Hassani, S.-N., Hezavehei, M., Jafari-Atrabi, M., Tahamtani, Y., Baharvand, H. **Combined therapy of mesenchymal stem cells with a GLP-1 receptor agonist, liraglutide, on an inflammatory-mediated diabetic non-human primate model** (2021) Life Sciences, 276, art. no. 119374.

4. Azimi, S., Golabchi, A., Nekookar, A., Rabbani, S., Amiri, M.H., Asadi, K., Abolhasani, M.M. **Self-powered cardiac pacemaker by piezoelectric polymer nanogenerator implant** (2021) Nano Energy, 83, art. no. 105781.

## Royan Center for Innovative Technologies Acceleration and Commercialization

Royan Innovative Technologies Acceleration and Commercialization Center (RITAC) was established in 2019, enhancing the fundamental values of Royan Institute for commercialization of research findings to offer services and biological products for the purpose of resolving the country's specialized needs. RITAC investigates on feasibility of studies, writes business plans, and guides Research and Technology Laboratory (RTL) researches to a higher financing and investment level. It also makes correlation between innovators, idea owner and investors.
RITAC is responsible for Venture Capital (VC) investment in Royan Institute through which some functional science-based companies and startup offices are handled. Here three companies are mentioned:

### Royan Stem Cell Technology Company

Royan Stem Cell Technology Company holds two private and public cord blood banks. The cord blood-extracted stem cell samples stored in both public and private banks, have made our country self-sufficient in providing the needed cells for cell-based transplantation. More than dozens thousand samples have been already stored in private bank whose owners have given their voluntary informed consent in donating them to the needy patients.




### Royan Biotech Company

Royan Biotech is a spin-off company of Royan Institute to become a key player in the production of advanced biotechnological products for research. Royan Biotech team has more than 10 years experience in production high quality and inexpensive recombinant proteins including growth factors for cell culture.



### Cell Tech Pharmed Company

Cell Tech Pharmed is a knowledge based company affiliated to Royan Institute and was launched with the investment of the Execution of Imam Khomeini's Order in 2018.
Cell Tech Pharmed is one of the subsidiaries of Barekat Pharmaceutical Group; that is operating in the fields of developing and transferring technical knowledge, commercialization of new technologies and drug manufacturing.
Royan researchers have been making enormous and continuous effort to apply stem cells for treatment of patients, and after several years of effort, Cell Tech Pharmed is launched in order to pave the way for better treatment procedures and satisfactory services for patients.



# TREATMENT

## Infertility Clinic

The rate of infertility between Iranian couples is estimated to be 10-15%. Royan Infertility Clinic is the second clinic which was established in Iran and the first one in Tehran in 1991. After 30- years experience in this field; although there are more than 80 infertility clinics throughout Iran, but due to high success rates in Royan infertility clinic, many patients prefer to have their treatments in this clinic. Most of our patients are referred by other physicians and clinics. Each year we have about 200,000 clinic visits and 6500 treatment cycles including numerous foreign patients who come to Iran for infertility treatment. Different services include: diagnostic and operative laparoscopy, hysteroscopy, cyctoscopy, IUI, ovulation induction, IVF, ICSI, PGT, PESA/TESE, microscopic TESA, vasovasostomy, vasoepididymostomy, TURD, gamete and embryo cryopreservation, assisted hatching, karyotyping, molecular genetic tests such as Factor V Leiden, Factor II and MTHFR gene, as well as others routinely offered to patients. More than three thousand couples have already had successful pregnancy in Royan Infertility Clinic.



Royan Infertility Clinic includes different sections for the assessment of different aspects of infertility and developing the best treatment methods:

- Endocrinology Section: Diagnosis and treatment of different endocrinologic disorders such as PCOS, thyroid dysfunctions and hyperprolactinemia. This section also consists of a diet clinic for effective treatment of infertility
- Endoscopy Section: Consists of laparascopy and hysteroscopy for the diagnosis and treatment of certain reproductive tract disorders such as cysts and adhesions
- Endometriosis Clinic
- Recurrent Abortion Clinic: For evaluation and treatment of different types of recurrent miscarriages
- Prenatology Clinic: For monitoring the mother's health during pregnancy, diagnosis and treatment for fetal abnormalities, performing P.W.D
- IVF Failure Clinic: Increasing the pregnancy rate and decreasing failures
- Male Infertility Clinic
- Psycho-Social Support and Counseling Clinic
- Genetic Counseling Clinic
- Reproductive Imaging modalities such as rectal and vaginal ultrasonography

## Cell Therapy Center

Royan Cell Therapy Center was established in 2008 to provide medical services and perform clinical trials. Available services through Good Manufacturing Practices (GMP) grade cell products are:

- Mesenchymal stromal cells for Osteoarthritis

- Melanocytes cells for Vitiligo
- Fibroblast cells for Wrinkle and Acne Scar
- Mono nuclear cells for Heart Failure
- Limbal stem cells for Chemical Injury of Cornea
- Muscle derived stem cells for Stress Incontinency



## Diabetes Clinic

Based on a decade of experience in basic and translational diabetes research, Diabetes Clinic of Royan Institute was established in 2019 to pursue its goals by implementing an interdisciplinary approach and building effective collaborations. The clinic has recruited expert human resources including scientists, clinicians and engineers and provides specialized facilities for better access of patients to standards of diabetes treatment.



Diabetes Clinic of Royan Institute helps to prevent diabetes by local population screening, and consists of several clinics including: Endocrine, Diabetes, Foot ulcer, Nutrition, Physical Activity, Psychology and Optometry Clinics. Each patient is assumed to be visited in all clinics in which special examination of patients such as exercise instructions by the specialist physicians for effective treatment and prevention of long-term complications of the disease are provided.

# EDUCATION

Since 1994 and paralleled with other specialized clinical and research-based activities, Royan Institute has been actively engaged to enhance the scientific level of researchers and transfer the experiences to national and international researchers through providing the teaching/learning opportunities in terms of long and short term specialized educational and training courses. These educational activities are as follow:

- Master of Science: Developmental Biology, Cellular and Molecular Biology, Stem Cell Biology, Genetics and Biochemistry
- PhD by research: Developmental Biology, Molecular Biology, Animal Physiology, Cellular and Molecular Sciences, Reproductive Biology
- Course-Based PhD: Tissue Engineering, Applied Cell Sciences, Reproductive Biomedicine and Developmental Biology
- Infertility Infetility and Andrology Fellowships

The short-term courses in Royan International Specialized Training Center including specialized workshops, seminars, symposiums and congresses for national and international audiences are hold by the following different departments of Royan Institute: Biotechnology, Reproductive Biomedicine (Embryology, Female and Male Infertility, Genetics, Imaging, Nursing & Midwifery) and Stem Cell Biology and Technology.

## Royan Edu-Tourism

Since 1993, Royan Institute has paid special attention to education and the transfer of the specialized experiences to national and international researchers, in line with raising students, researcher and public health awareness through providing research programs and specialized clinical services. Since, "Education" is stated as one of the main themes of Royan Institute strategic plan, it is particularly significant for the deputy of education to prepare the strategic plan with emphasis on directors' invaluable experiences and the facilities and potentials of the institute.
The various scientific laboratories of Royan Edu-Tourism Center include: Cell Culture, Molecular, General Lab, Embryology, Flow cytometry, Clean Room and Animal Surgery room.



## Royan International Twin Congress

Royan International Twin Congress on Reproductive Biomedicine and Stem Cells Biology & Technology is a unique event in its own field in Iran and the Middle East. The congress is a joint of two separate congresses with different themes held annually by Royan Reproductive Biomedicine and Stem Cell Biology & Technology Research Institutes. The congress main objective is to bring together researchers and practitioners from all over the world to stimulate and promote research in Royan Congress fields of interest.
Moreover, Royan International Twin Congress is an extraordinary opportunity and promising occasion for international participants to experience the warm hospitality of Iranians and it is an exciting adventure to visit Iran's

picturesque and glamorous beauties to touch the rich Iranian history, glamorous architecture, and art as well as vast diversity of natural landscapes and resources.



## Faculty of Basic Sciences and Medical Technology

By virtue of establishment authorization issued by Ministry of Medical Education, the Faculty of Basic Science and Advanced Technology was founded in 2017. The higher education courses were launched by enjoyment and support of scientific hubs' capabilities affiliated to ACECR.
PhD courses offered in this faculty are as follows:

- Applied Cell Science in cooperation with Royan Institute
- Tissue Engineering in collaboration with Royan Institute
- Reproductive Biology in partnership with Avicenna Institute

### Mission

Cooperation in development and elevation of health conditions in the country.
Elevation of scientific position at international levels by providing and paving the appropriate way for scientific fabric and necessary infrastructure for research activities to expand the frontiers of knowledge.



### Policy

- Promotion and advancement of applied research in State-of-the-art medical technologies
- Extension of interactions with basic science and clinical sphere
- Promotion of product oriented education, leading to commercialization of research achievements to meet country's scientific requirements
- Expansion of international relationships in research and advanced medical technologies
- Promotion of existing capabilities to access the frontiers of knowledge

## Royan Institute Publication

Royan publications include scientific books in national and international levels in different Royan Institute fields of interest. The following books are some examples among the already published books:

- Diagnosis of Congenital Uterine Malformations by Imaging Techniques
  Publisher: NAHL, England, 2019
- Stem Cell Nanoengineering
  Publisher: John Wiley and Sons, USA, 2015
- Regenerative Medicine and cell therapy
  Publisher: Humana Press, Springer, USA, 2012
- Advances in Stem Cell Research
  Publisher: Humana Press, Springer, USA, 2012
- Trends in Stem Cell Biology and Technology
  Publisher: Humana Press, Springer, USA, 2009

Royan Publication Department publishes two scientific journals which are published quarterly as well: Cell Journal and International Journal of Fertility and Sterility.

Cell Journal (Yakhteh) is an international open access, peer-reviewed scientific journal which gets published to disseminate information through publishing the most recent scientific research studies on exclusively cellular, molecular and other related topics. Cell Journal (Yakhteh), has been certified as a quarterly publication by Ministry of Culture and Islamic Guidance in 1999 and was accredited as a scientific and research journal by HBI (Health and Biomedical Information) Journal Accreditation Commission in 2000. This journal is a member of the Committee on Publication Ethics (COPE).

International Journal of Fertility & Sterility (Int J Fertil Steril) is a quarterly international journal which publishes research papers across a broad range of disciplines within Fertility and Sterility. Areas covered include Gynecology and Female Infertility, Andrology, Reproductive Genetics, Embryology, Epidemiology, Reproductive Ethics, Endocrinology and Metabolism, Pathology, Psychology and Psychiatric, Radiology and Imaging and Immunology. Int J Fertil Steril has been certified by Ministry of Culture and Islamic Guidance in 2007 and was accredited as a scientific and research journal by HBI (Health and Biomedical Information) Journal Accreditation Commission in 2008. International Journal of Fertility & Sterility is an Open Access journal.






# Congress Invited Speakers

## International speakers of the 23rd Congress on Reproductive Biomedicine



**Dr Ali Honaramooz**
Department of Veterinary Biomedical Sciences
Western College of Veterinary Medicine
University of Saskatchewan, Canada



**Dr Akash Kumar**
MyOme, Inc.
Menlo Park
CA, USA



**Dr Jan Brosens**
Division of Biomedical Sciences, Warwick Medical School, University of Warwick
UK



**Dr Herman Tournaye**
Centre for Reproductive Medicine
Free University of Brussels
Brussels, Belgium



**Dr Adolfo Flores-Saiffe**
IVF 2.0 LTD
London
UK



**Dr Pierre Ray**
Université Grenoble-Alpes, Institute for Advanced Biosciences,Team Genetics Epigenetics and Therapies of Infertility
Grenoble, France



**Dr Isabelle Demeestere**
Research Laboratory on Human Reproduction and Fertility Clinic, Department of Obstetrics and Gynecology, Université Libre de Bruxelles
Belgium



**Dr George Pistofidis**
Department of Gynecologic Endoscopy
Lefkos Stavros Hospital
Athens, Greece



**Dr Pietro Santulli**
Department of Gynecology Obstetrics II and Reproductive Medicine, Faculty of Medicine, Cochin University Hospital, Paris, France



**Dr Charles Chapron**
Department of Gynecology Obstetrics II and Reproductive Medicine, Centre Hospitalier Universitaire, Paris, France



**Dr Francisco Carmona**
Service of Gynecology, Hospital Clinic of Barcelona, University of Barcelon
Spain



**Dr Alexander Popov**
Department of Endoscopic Surgery, Regional Scientific Research Institute of Obstetrics & Gynecology, Moscow, Russia

# Congress Invited Speakers

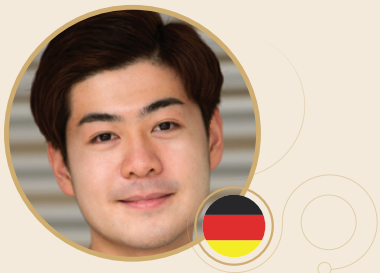
## International speakers of the 23rd Congress on Reproductive Biomedicine



**Dr Aleksander Giwercman**
Division of Molecular Reproductive Medicine,
Department of Translational Medicine, Lund
University, Malmö, Sweden



**Dr Cinzia Santa Di Pietro**
Department of Biomedical and
Biotechnological Sciences, Section of Biology
and Genetics, University of Catania, Italy



**Dr Chun So**
Department of Meiosis, Max Planck Institute
for Multidisciplinary Sciences
Gottingen, Germany



**Dr Alberto Vaiarelli**
Clinica Valle Giulia
GeneraLife IVF
Rome, Italy



**Dr Reza Nosrati**
Department of Mechanical and Aerospace
Engineering, Monash University
Clayton, Australia



**Dr Maurizio Dattilo**
R&D Department
Parthenogen
Lugano, Switzerland



**Dr Denny Sakkas**
Boston IVF
Waltham
Massachusetts, USA



**Dr Hossein Yazdkhasti**
Center for Membrane and Cell Physiology
University of Virginia, School of Medicine
Charlottesville, USA



**Dr Saadi Khochbin**
Institute for Advanced Biosciences, Université
Grenoble-Alpes, INSERM, Grenoble, France



**Dr Germar-Michel Pinggera**
Department of Urology
Innsbruck Medical University
Austria



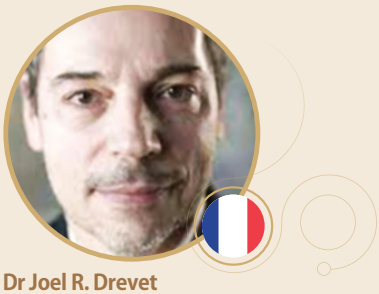
**Dr Ashok Agarwal**
American Center for Reproductive Medicine
Cleveland Clinic, Cleveland
Ohio, USA



**Dr Murat Gul**
School of Medicine, Department of Urology,
Selcuk University
Konya, Turkey

# Congress Invited Speakers

## International speakers of the 23rd Congress on Reproductive Biomedicine



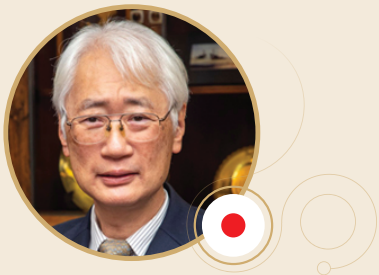
**Dr Joel R. Drevet**
Université Clermont Auvergne, Faculté de Médecine, CRBC (Centre de Recherche Bio-Clinique), Clermont-Ferrand, France



**Dr Paraskevi Vogiatzi**
Andromed Health & Reproduction
Fertility Diagnostics Laboratory
Maroussi, Greece



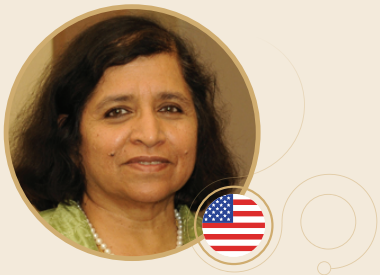
**Dr Zahra Anvar**
Department of Obstetrics and Gynecology
Baylor College of Medicine
Houston, USA



**Dr Shigeru Saito**
Department of Obstetrics and Gynecology
University of Toyama
Toyama, Japan



**Dr Jorge Hallak**
Faculty of Medicine
Division of Urology University of São Paulo
São Paulo, Brazil



**Dr Vasantha Padmanabhan**
Department of Pediatrics
University of Michigan, Ann Arbor
Michigan, USA



**Dr Bjorn Petersen**
Friedrich Loeffer Institute
Germany



**Dr Stephen Frankenberg**
Department of Zoology
University of Melbourne
Melbourne, Australia



**Dr Fatimah Hussein**
Spire Thames Valley Hospital
UK



**Dr Evrim Ünsal**
Mikrogen Genetic Diagnosis Laboratory
Yüksek İhtisas University Faculty of Medicne
Department of Medical Genetics, Turkey

# Congress Invited Speakers

## International Speakers of 18th Congress on Stem Cell Biology and Technology



**Dr Fatemeh Ajalloueian**

IDUN center of excellence, Department of Health Technology, Technical University of Denmark, Denmark



**Dr Mohsen Adeli**

Institute of Chemistry and Biochemistry
Freie Universität Berlin
Berlin, Germany



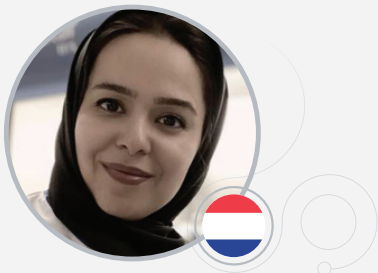
**Dr Gilson Khang**

Department of Bionanotechnology and Bio-Convergence Engineering
Jeonbuk National University, Korea



**Dr Tokameh Mahmoudi**

Department of Biochemistry
Erasmus University Medical Center
Rotterdam, The Netherlands



**Dr Mahsa Mollapour Sisakht**

Department of Biochemistry
Erasmus University Medical Center
Rotterdam The Netherlands



**Dr Ana Ivonne Vazquez-Armendariz**

Department of Medicine V, Internal Medicine, Infectious Diseases and Infection Control, Universities of Giessen and Marburg Lung Center (UGMLC) Germany



**Dr Ebrahim Mostafavi**

Stanford Cardiovascular Institute
Department of Medicine, Stanford University School of Medicine, Stanford, CA, USA



**Dr Andreas Nüssler**

Department of Traumatology, Siegfried Weller Institute, BG Clinic, Eberhard Karls University Tübingen, Tübingen, Germany



**Dr David Hay**

Centre for Regenerative Medicine, Institute for Regeneration and Repair, The University of Edinburgh, Edinburgh, UK



**Dr Majid Ebrahimi Warkiani**

School of Biomedical Engineering
University of Technology Sydney
Sydney, Australia



**Dr Omid Mashinchian**

Nestlé Research, Ecole Polytechnique Fédérale de Lausanne (EPFL) Innovation Park
Lausanne, Switzerland



**Dr Bartomeu Colom**

Wellcome Sanger Institute
Hinxton, Cambridge
UK

# Congress Invited Speakers

## International Speakers of 18th Congress on Stem Cell Biology and Technology



**Dr Jette Lengefeld**

Institute of Biotechnology
University of Helsinki, Finland
Department of Biosciences and Nutrition
Karolinska Institutet, Finland



**Dr Ana Claudia Trocoli Torrecilhas**

Departamento de Ciências Farmacêuticas,
Laboratório de Imunologia Celular e Bioquímica
de Fungos e Protozoários, Federal University of
Sao Paulo (UNIFESP), Diadema, Brazil



**Dr Amir Nasiri Kenari**

Hoshino Labratory
Tokyo Institute of Technology
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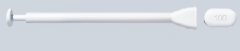

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In ART, make use of the right signals when they are needed.

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