

ROYAN INSTITUTE

THE TWENTY-THIRD  
**ROYAN**  
INTERNATIONAL  
RESEARCH AWARD  
THE SIXTH KAZEMI PRIZE



SEPTEMBER 2024  
TEHRAN - IRAN

# 2025

THE TWENTY-FOURTH  
**ROYAN**  
INTERNATIONAL  
RESEARCH AWARD



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In the Name of  
**GOD**

The Twenty-Third

**ROYAN**

INTERNATIONAL RESEARCH AWARD  
THE SIXTH KAZEMI PRIZE



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







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## FOREWORD

**Dr Moslemi Naeini**  
President of ACECR

It is my pleasure to welcome the esteemed guests to Royan International Research Award- the 6th Kazemi Prize. 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 biomedicine, stem cell biology and technology, cell therapy, regenerative medicine, biotechnology, herbal medicine and cancer biology. So far, the goal has been the promotion of science and improving health services. I am honorable to announce that ACECR aims to become one of the innovation ecosystems for Iranian elites to join, an entrepreneur and a source of hope among the young researchers.

While ACECR has had impressive success in all related fields of engineering, human sciences and agriculture, medicine was a breakthrough which became possible in centers such as Royan Institute, Avicenna Research Institutes, and Motamed Cancer Institute.

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 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 some years of gap in holding the scientific award due to Covid-19 pandemic and other circumstances, the Royan International Research Award-6th Kazemi Prize is held in 2024.

One of the key activities of Royan International Research Award is Kazemi Prize which is awarded to a scientist/s who have made an outstanding contribution to biological sciences and health promotion. This Prize was established in 2010, upon the proposal of Ayatollah Khamenei, Iran supreme leader, to respect the efforts and revive the memories of Dr Saeid Kazemi Ashtiani; the late founder of Royan Institute. This prize is awarded by Royan Institute, ACECR and Vice Presidency for Science, Technology and Knowledge Based Economy and already has been given to five prominent scientists from USA, Germany, the Netherlands and Italy. This year we are going to award the 6th Kazemi Prize

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-6th Kazemi Prize. I hope we can continue this scientific event in the coming years with the attendance of the selected winners. Here I express my warm thanks to the policy making committee members of the 6th Kazmi Prize.





# 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 announce the successful holding of Royan International Research Award-6th Kazemi Prize this year. Despite all existing challenges, the scientific and executive committee of Kazemi Prize were determined to hold the Award this year, for which I am grateful. And of course, I appreciate the kind cooperation of our winner in accompanying this scientific event.

Today, scientists extended borders and created a united society for global collaboration. Meanwhile, virtual and on-line 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.

It is my pleasure to declare some of my colleagues' achievements in Royan Institute which have been published in other high rank International scientific journals such as:

Placing Royan Institute as one of the top ten research institutes worldwide during the last two decades according to the total number of publications in the field of male infertility and assisted reproductive techniques (ART)

Placing Royan Institute as the 5th center of the top 10 institutions worldwide based on the last 30 years of Scientometric Study in the field of research on Human Varicocele

As the close collaboration of biological science and medicine is increasingly revolutionized therapeutic strategies and enlightened the path towards treatment of incurable diseases, 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 discover cutting-edge science and apply it for future medicine. 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 a world full of health and happiness.



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# 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 Modares University. He received his Doctorate Degree with Distinction In 1998.

Dr. Kazemi established Royan Research 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 Research 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.





The procedure for proposal and selection of the 6<sup>th</sup> Kazemi Prize candidates is as follow:  
The Executive Committee of Kazemi Prize nominates the notable scientist/s who made an outstanding contribution in the fields of infertility treatment, stem cell biology and technology, or regenerative medicine. After consulting with the scientific council of Royan Institute consisted of distinguished scientists in related fields, the recipient/s of the prize will be ultimately designated by the Kazemi Prize Policy making Committee and will be announced during Kazemi Prize ceremony.

Kazemi Prize Policy making Committee, that is responsible for approving the main policies of the prize, consists of:

- The president of Academic Center for Education, Culture and Research (ACECR)
- The President of Iran Academy of Science or the relevant deputy
- The Minister of Science, Research and Technology or the relevant deputy
- The Minister of Health and Medical Education or the relevant deputy
- Two renowned scientists from related fields
- The president of Royan Institute

Kazemi Prize Executive Committee, that is responsible for proposing the candidates and evaluation criteria to the Prize Policy making Committee, Evaluating the candidates and executing the Prize Process, consists of:

- The president of Royan Institute
- Deputy Dean for Research Affairs
- Three distinguished scientists from Royan Institute and other universities or research institutes approved by the prize policy making committee

In 2010 the first Kazemi Prize was awarded to Prof. Rudolf Jaenisch (USA)

In 2011 the second Kazemi Prize was awarded to Prof. Hans Robert Schöler (Germany)

The third Kazemi Prize was awarded to Prof. Robert S. Langer (USA) in 2015

In 2016 the fourth Kazemi Prize recipient was Prof. Hans Clevers (The Netherlands)

In 2018 the fifth Kazemi Prize was awarded to Prof. Michele De Luca (Italy)

## 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

# Winners



## Stem Cell Biology and Technology



2024

Thomas Braun, MD, PhD

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Germany

Thomas Braun is a Director at the Max Planck Institute for Heart and Lung Research. He received his PhD in Medicine (1987) and German Habilitation in cellular biochemistry (1993) at Universities of Göttingen and Hamburg respectively, then appointed as the Professor at the University Halle-Wittenberg, became the director of the Institute of Physiological Chemistry (1998-2004).

In 2004, he accepted an offer by the Max-Planck-Society to act as the founding director of the new Max-Planck-Institute (MPI) for Heart and Lung Research in Bad Nauheim, which succeeded the previous MPI for Physiological and Clinical Research. His current work spans the molecular control of heart and skeletal muscle development, stem cells and the regeneration of contractile tissues as well as aging and adaptation of the cardiovascular system. The institute has a strong translational arm with a proven track record in innovative therapies resulting in the introduction of several new treatment regimens mostly in the field of lung disorders. Since 1991, he has successfully trained numerous undergraduate and graduate students and postdocs. He was also the speaker of the International Max-Planck-Research School for Heart and Lung Research, which was jointly hosted by the Max-Planck-Institute and the Universities of Giessen and Frankfurt.

During his scientific career, he has authored more than 200 publications in top international journals, coordinated several large research initiatives, and helped to shape the Max-Planck-Institute for Heart and Lung Research, which is now one of the most respected cardiovascular research institutions in Germany.

His pioneering research on the molecular mechanisms of pluripotency has established the basis of recent knowledge on the stem cells and potential application.

## Requirements of stem cell-mediated skeletal muscle regeneration

### OBJECTIVE:

Contraction of skeletal muscles is mediated by syncytial myofibers, containing a highly specialized contractile apparatus maintained by large numbers of post-mitotic myonuclei. Adult skeletal muscle fibres are terminally differentiated and cannot be replenished without the help of muscle stem cells (MuSC), closely attached to myofibers and situated below the basal lamina.

### MATERIALS AND METHODS:

We have studied the transcriptional networks necessary to generate and maintain muscle cells from uncommitted mesodermal progenitor cells during embryonic development. Furthermore, we investigated the requirements of stem cell-mediated skeletal muscle regeneration.

### RESULTS:

We discovered that the H4K20 methyl transferase Kmt5b is essential to maintain a high level of heterochromatin in muscle stem cells (MuSCs), whose depletion promotes exit of MuSCs from quiescence. We also found that loss of heterochromatin in Kmt5b-deficient MuSCs leads to aberrant transcription during S-phase, facilitating transcription replication collisions and genome instability. We concluded that transcriptional regulation of chromatin modifiers controlling heterochromatin formation is decisive to keep MuSCs in a quiescent state and to maintain nuclear architecture.

Thus, we searched for transcription factors or transcriptional co-factors that may play a role in the regulation of chromatin modifiers in MuSCs. Surprisingly, we identified TAF4A, primarily known as a subunit of the general transcription factor TFIID, as critical for genome stability and quiescence of MuSC. TAF4A is necessary for expression of Katsl2, which together with MOV is part of the non-specific lethal (NLS) complex, acetylating nuclear lamin A/C. Impaired acetylation of lamin A/C decreases stiffness of MuSC nuclei and disrupts the nuclear architecture. The subsequent loss of heterochromatin and MuSC activation, in combination with pronounced genomic instability, activates MuSCs and impairs MuSC proliferation. Furthermore, we found that Piezo1, a mechanosensitive ion channel, keeps MuSCs in a quiescent state and prevents senescence. Inactivation of Piezo1 results in compensatory up-regulation of T-type voltage-gated Ca<sup>2+</sup> channels, leading to increased Ca<sup>2+</sup> influx, which strongly induces NOX4 expression via cPKC. Elevated NOX4 expression increases ROS levels and DNA damage, causing P-53-dependent cellular senescence and cell death of MuSCs. Pharmacological inhibition of P53 in Piezo-1 deficient mice abrogates increased senescence of MuSC and normalizes muscle regeneration.

### CONCLUSION:

Reduced mechano-signaling due to decreased physical activity during aging may contribute to the increase of senescent cells and the decline of MuSC numbers in geriatric mice and humans.





# Winners

## Stem Cell Biology and Technology



2024

**Nikolas Rivron, PhD**

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Austria

Dr. Rivron is a distinguished young scientist and a group Leader of the Laboratory for Blastoid Development at the Institute of Molecular Biotechnology, Austrian Academy of Science. He received his PhD in vascular biology and tissue engineering at the University of Twente. His lab explores how self-organization complements traditional hierarchical genetic (e.g., HOX genes collinearity) and molecular (e.g., morphogen gradients) processes to shape the mammalian organism. They created a unique model of the blastocyst, termed the blastoid, which is formed

by the spontaneous organization of stem cells in a dish. Blastoids contain all three cell types that further develop into the complete organism (embryonic and extra-embryonic tissues), and implant when transferred in utero. Contrary to blastocysts, blastoids are versatile in that they facilitate the systematic modulation and analysis of the impact of cell numbers, states and communication mechanisms on development. Furthermore, blastoids are readily generated in large numbers, making them suitable for high-throughput genetic and drug screens. They observed how self-organization contributes to multicellular patterning and coordinated cellular decision making in blastocysts and blastoids. His Vision is to understand the principles that synchronize cells in space and time to shape the early mammalian embryo and his Mission is opening the black box of early development. He authored several papers in famous journals such as Nature, Developmental Cell and Stem Cell Reports. He was the invited speaker of several prestigious conferences including ISSCR. He received several grants and awards as well as filing multiple patents. Dr. Rivron is the co-founder of dawn-bio, a biotech company that leverages blastoids for human reproductive medicine.

His pioneering work on the development of human blastoids was a breakthrough which was published in the Nature that paves the way for improving in vitro fertilization success rate and new non-hormonal, user-friendly contraception and his Mission is Opening the black box of early development. He authored several papers in famous journals such as Nature, Developmental Cell and Stem Cell Reports. He was the invited speaker of several prestigious conferences including ISSCR. He received several grants and awards as well as filing multiple patents. Dr. Rivron is the co-founder of dawn-bio, a biotech company that leverages blastoids for human reproductive medicine.

His pioneering work on the development of human blastoids was a breakthrough which was published in the Nature that paves the way for improving in vitro fertilization success rate and new non-hormonal, user-friendly contraception. Dr. Rivron pioneered a research that will shape the future of in vitro embryos.

## Blastoids: modeling blastocyst genesis and implantation with stem cells

### OBJECTIVE:

The blastocyst is the early mammalian organism before implantation in the uterus.

### MATERIALS AND METHODS:

We have promoted the self-organization of stem cells into models of mouse and human blastocysts, which we have named blastoids (Nature 2018, Nature 2021).

### RESULTS:

Blastoids are morphologically and transcriptionally similar to the blastocyst and contain analogs of all three cell types that would eventually develop into the complete organism (embryonic and extraembryonic). Because blastoids are complete and model the preimplantation stage, they can be introduced into the uterus (mouse model) or combined in vitro with uterine cells (human model) to recapitulate aspects of the normally hidden implantation processes. Unlike blastocysts, blastoids come in large numbers and facilitate a more systematic modulation and analysis of development. As such, they represent both a scientific and ethical alternative to the use of embryos for research. Using this approach, we are investigating the genome evolution underlying species-specific aspects of blastocyst development and implantation, with the long-term goal of understanding the evolutionary basis of suboptimal human pregnancy (%50 of fertilized eggs never develop).

### CONCLUSION:

This knowledge could help solve the global health problems of family planning and developmental origin of health and disease.



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## Kazemi Prize Winner, 2010

**Rudolf Jaenisch MD, PhD**

**Whitehead Institute, Cambridge, MA**

Dr. Jaenisch received his MD degree from the University of Munich in 1967. After postdoctoral research at Princeton and the Fox Chase Cancer Center, he first joined the faculty at the Salk Institute and later became Head of the Department of Tumor Virology of the Heinrich- Pette Institute in Hamburg. In 1984 he became a Founding Member of the Whitehead Institute for Biomedical Research and Professor of Biology at the Massachusetts Institute of Technology. In 2005 he established the Human Stem Cell Facility at the Whitehead Institute. The central focus of Dr. Jaenisch's research is studying stem cells, mammalian development and diseases using molecular and genetic tools. He has made several landmark contributions to our understanding of mammalian genetics, developmental biology and disease mechanisms. Dr. Jaenisch produced the first transgenic mouse strain; he inserted viral genes into early embryos and showed that the mice developed from these embryos could transmit to the next generation, at Mendelian expectations, the experimentally added exogenous viral sequences in their genomes. This work both proved that mammalian genome could be experimentally manipulated to produce stably altered new murine strains, and also provided a powerful tool for mutagenizing and tagging genes of interest across the mouse genome. This technology has now become a classic/standardized method of mutagenesis (for details, one can consult the International Gene Trap Consortium <http://www.genetrap.org/>).



Dr. Jaenisch's work on retroviral insertion into early embryos led to his next major discovery of developmental stage-specific DNA methylation of viral sequences as the key molecular mechanism of retroviral silencing. With the advent of embryonic stem cells and the possibility of introducing mutations in predetermined genes via homologous recombination (for which Drs. Smithies and Cappechi won the Nobel Prize), Dr. Jaenisch and colleagues genetically mutated the enzyme responsible for de novo DNA methylation and demonstrated that DNA methylation is essential for the survival of somatic cells, for cancer development, genomic imprinting, X chromosome inactivation and the stability of the genome. When the first cloned mammals produced by nuclear transplantation were published in 1997/1998, Dr. Jaenisch immediately recognized that nuclear cloning represents the most unbiased approach to study the role of epigenetics in development, differentiation and disease. He decided to refocus his research and used nuclear transplantation to study the mechanisms that cause reprogramming of the genome of an adult cell to an embryonic state – producing a totipotent cell and, subsequently, an individual – from a lineage-specific adult cell. Somatic cell nuclear transfer (SCNT) and the derivation of “customized” ES cells opened the prospect of generating patient-specific ES cells for stem cell therapy that would not be rejected after transplantation into the patient, a concept often referred to as “therapeutic cloning”. The Jaenisch laboratory was the first to demonstrate that SCNT in combination with gene therapy was a valid approach to treat a genetic disorder of the immune system. While this “proof of principle” experiment was encouraging and suggested that this technology might also work for stem cell therapy of human diseases, strong ethical objections were raised against the use of cloned human embryos for the production of patient- specific ES cells. “Altered Nuclear Transfer” (ANT) was suggested as a potential solution to this dilemma. The ANT concept proposed to genetically alter the somatic donor cell prior to nuclear transfer into the egg with the goal that the product of this operation would not constitute a viable embryo, but would still be able to generate normal “customized” ES cells. Again, the Jaenisch laboratory showed that the ANT approach would work and that normal ES cells can be generated from clones incapable of implantation and forming viable embryos.

Although promising, the ethical barrier of using human eggs and low efficiency of generating “customized” ES cells via nuclear transfer led Dr. Jaenisch to seek alternative ways to reprogram adult cells to a pluripotent ES cell-like state without the use of human eggs. Dr. Jaenisch and colleagues established the molecular circuitry of pluripotency, identified critical regulatory genes that distinguish the epigenetic state of an ES cell from that of a somatic cell, and discovered key transcription factors that provide the molecular identity and functionality of pluripotency. When expressed the key pluripotency factors in somatic cells, Yamanaka and colleague demonstrated in a landmark paper that four such factors were able to reprogram in vitro a skin cell to a pluripotent state. While the first publication did generate pluripotent cells, these cells were very different from normal ES cells by molecular and biological criteria, which caused widespread skepticism as to the importance of this finding for medicine. It was only one year later when a crucial modification of the approach both from the Jaenisch laboratory and the Yamanaka laboratory achieved the generation of pluripotent cells (iPS) that were indistinguishable from normal ES cells by all criteria tested. These three publications reporting both similar and complementing results attracted enormous attention throughout the world and catapulted the induced pluripotent stem cell field to become one of the hottest areas in biology and medicine. More recently, his laboratory has made major inroads in understanding the mechanisms involved in somatic cell reprogramming. They showed that all somatic cells have the potential to generate iPS cells and that the process involves stochastic events. Recent studies from the Jaenisch group have taken the promising reprogramming technology to stem cell therapy. At this level, I think there is no question that the Jaenisch laboratory has lead the way in demonstrating, in mouse models, the practical potential for this technology, and suggested its way into the clinic. As a proof of principle study, the Jaenisch group recently demonstrated therapy for a sickle cell anemia mouse model by utilizing iPS cells, derived from autologous skin cells, in which the mutated fetal hemoglobin gene had been repaired by homologous recombination. More recently, they demonstrated the integration of iPS derived neurons into fetal brain and the subsequent reduction of symptoms in rats with Parkinson’s disease, again paving the road toward iPS-mediated therapy in humans. To extended stem cell therapy to clinic, the Jaenisch group has generated a series of patient specific iPS cells from biopsies of patients with the Parkinson’s disease. Importantly, the approach used led to iPS cells from which the reprogramming vectors had been removed. However, the translation of the iPS approach to stem cell therapy of human diseases still faces major technical issues. One important unresolved problem has been the inefficiency of genetic manipulations in human ES or iPS cells, a procedure that is routine in mouse ES cells. Recently, the Jaenisch group used a novel approach for gene targeting that involved Zn-finger nucleases that allowed efficient correct genetic alterations in human ES and iPS cells, paving the road for stem cell therapy of human diseases. A major set back for the human stem cell field has been that human ES cells are so difficult to work with: they do not grow as single cells, require mechanical passage and are inefficient in using homologous recombination for gene targeting. Most recently, the Jaenisch lab has generated new human ES cells that have properties of mouse ES cells, a breakthrough that may allow using similar methods with human cells as has been routine with mouse.

During the past forty years, Dr. Jaenisch has coauthored more than 400 research papers and has received numerous prizes and other forms of recognition. He was elected to the National Academy of Sciences in 2003, and received the Peter Gruber Foundation Award in Genetics, the Robert Koch Prize for Excellence in Scientific Achievement, the Charles Rodolphe Brupbacher Foundation Cancer Award, the Max Delbrück Medal for Molecular Medicine and the Vilcek Foundation Prize for Achievements of Prominent Immigrants – only a few among the many honors and awards he has received. Throughout his scientific career, he has published more than 400 scientific papers and has mentored more than 200 students and postdoctoral fellows, many of whom have become the leaders of their respective fields. He has traveled around world and promotes international scientific exchange and collaborations. Dr. Jaenisch is one of the most innovative and creative scientists in the field of developmental biology, gene regulation, stem cell biology and stem cell-mediated therapies.



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## Kazemi Prize Winner, 2011

### Prof. Hans Robert Schöler

#### Max Planck Institute for Molecular Biomedicine

Professor Dr. Hans R. Schöler is a world-renowned stem cell biology researcher who has made significant contributions to the field over the past 30 years. A topic that has intrigued him since he was a student concerns the characteristics that distinguish between soma and germline in mammals.

Dr. Schöler has continuously expanded his field of research while maintaining the underlying perspective of a molecular biologist. First, he studied the biochemical interactions of DNA topoisomerases as part of his diploma thesis, then he investigated the function and regulation of transcription factors and their role in cellular and developmental biology, and finally, he examined factors involved in reproductive biology. His capability to span and bridge distinctly different research areas is evidenced by publications in top-notch journals in all these areas. Also attesting to his broad and continuously expanding base is the variety of leadership positions he has held. He first headed a research group in the Gene Expression Programme of the European Molecular Biology Laboratory (EMBL) at the University of Heidelberg, and then was a professor of Reproductive Physiology at the University of Pennsylvania and Director of the Center of Animal Transgenesis and Germ Cell Research. Since 2004, he has served as Director of the Max Planck Institute for Molecular Biomedicine in Munster, heading the Department of Cell and Developmental Biology; he also is an adjunct professor in the Department of Biochemistry at the University of Pennsylvania. Finally, he is a full professor at the Medical School of the Westphalian Wilhelms University in Munster, and an adjunct professor (with a laboratory) and member of the successful German Excellence Initiative Regenerative Biology to Reconstructive Therapy (RE-BIRTH) at the prestigious Medical School Hanover (MHH).

When he wrote his PhD thesis, the tools required to study complex biological questions at the molecular level were rather lacking. Mammalian gene regulation and function had only just begun to be analysed, and viruses provided the first insights into cellular function. Using discrete regulatory elements of SV40 and other viruses, he developed an *in vivo* competition assay that provided the first evidence that cellular factors mediate the activity of transcriptional viral (Cell 1984) and cellular enhancers (Science 1986), settling a long-standing controversial issue. He studied the activity of such factors by *in vitro* transcription assays and helped define the binding sites of specific nuclear factors (EMBO j. 1986; Nature 1987). To make preimplantation embryos amenable to biochemical analysis, he developed a micro-extraction assay that used fewer than 100 cells. With this assay, he tested several binding sites for factors that are not found in somatic cells but are specifically expressed by pluripotent cells of the preimplantation mouse embryo and cells of the germ cell lineage- the two principal parts of the mammalian germline. This led to the identification of Oct4 and several other proteins, which were described in two back-to-back EMBO papers, establishing a solid basis for further studies by his research group and others. cDNA cloning and detailed analysis suggested that the POU transcription factor Oct4 plays an important role in the mammalian germline (Nature 1990, EMBO J 1990, Dev Biol 1994, Development 1996, and Dev Cell 2001). Subsequent papers confirmed that Oct4 is also essential for the pluripotency and survival of germline cells (Cell 1998; EMBO Rep 2004). Recently, Hans Schöler's laboratory found that Oct4 alone is sufficient to induce pluripotency in adult neural stem cells, thus also demonstrating the central role of this transcription factor in establishing pluripotency (Nature 2008; 2009; Cell 2009). Subsequent work was on obtaining a better understanding of pluripotent cells (Cell Stem Cell 2010; Cell 2010a) and the





molecular process of reprogramming (Cell 2010b; Nature Cell Biology 2011). The article “Generation of Induced Pluripotent Stem Cells Using Recombinant Proteins” published in Cell Stem Cell in 2009 reported an early attempt to reprogram somatic cells without viruses.

As Oct4 is both a crucial component and an ideal marker for pluripotency, Dr. Schöler has also used it as a marker to study the process of reprogramming after somatic cell nuclear transfer into oocytes and during fusion of somatic and pluripotent cells (Stem Cells 2004). His laboratory provided the first evidence that mouse embryonic stem cells could be induced to differentiate into eggs, provoking a tremendous splash in scientific journals and in the media. This publication paved the way for a completely new area of research, and the implications for society at large are still being discussed.

Hans Schöler has also had a strong interest in structural biology as a prerequisite to understanding processes at the molecular level.

For more than 10 years, Hans Schöler’s research group has investigated Sox2 and elucidated the role of the heterodimer complex of Sox2 and Oct4 on DNA (Gene s Dev 1998; 2003). Six years after publishing the crystal structure of a POUjHMGjDNA ternary complex, it was chosen as “Molecule of the Month” by the Protein Data Bank, highlighting its relevance in pluripotency and cellular reprogramming.

Hans Schöler is considered as one of the leading researchers in stem cell biology worldwide. He is a member of the editorial boards of the top-notch journals in his field, including Cell, Cell Stem Cell, and Stem Cells. He is also a member of the German Academy of Sciences Leopoldina and of three Academies of Sciences located in different German Federal States in 2008, he shared the prestigious Robert Koch Prize with Drs. Irving L. Weissman and Shinya Yamanaka for his critical contributions to stem cell biology and in recognition of his groundbreaking work on the derivation of eggs from stem cells. In recognition of his important contributions to the field of stem cell biology, he received one of the highest honours by the Ulsan National Institute of Science and Technology (UN1ST) and had a new stem cell institute named after him- the “Hans Schöler Stem Cell Research Center.”

His laboratory is at the forefront of studies into cellular reprogramming mediated by nuclear transfer, cell-cell fusion, or transduction by viruses or proteins. Using induced stem cell (iPS) cell technology, his laboratory can, in principle, generate any type of cell from patients who suffer from a genetic disease.

### **Kazemi Prize Winner, 2015**

### **Professor Robert S. Langer**

### **David H. Koch Institute**

Professor Robert S. Langer is the David H. Koch Institute Professor. Dr Langer has written over 1,300 articles. He also has over 1,080 patents worldwide. Dr Langer’s patents have been licensed or sublicensed to over 300 pharmaceutical, chemical, biotechnology and medical device companies. He is the most cited engineer in history (h-index 211).

He served as a member of the United States Food and Drug Administration’s SCIENCE Board, the FDA’s highest advisory board, from 1995-- 2002 and as its Chairman from 1999-2002. Dr Langer has received over 220 major awards. He is one of 4 living individuals to have received both the United States National Medal of Science (2006) and the United States National Medal of Technology and Innovation (2011). He also received the 2002 Charles Stark





Draper Prize, considered the equivalent of the Nobel Prize for engineers, the 2008 Millennium Prize, the world's largest technology prize, the 2012 Priestley Medal, the highest award of the American Chemical Society, the 2013 Wolf Prize in Chemistry, the 2014 Breakthrough Prize in Life Sciences and the 2014 Kyoto Prize. He is also the only engineer to receive the Gairdner Foundation International Award; 82 recipients of this award have subsequently received a Nobel Prize. In 2015, Dr Langer received the Queen Elizabeth Prize for Engineering. Among numerous other awards Langer has received are the Dickson Prize for Science (2002), Heinz Award for Technology, Economy and Employment (2003), the John Fritz Award (2003) (given previously to inventors such as Thomas Edison and Orville Wright), the General Motors Kettering Prize for Cancer Research (2004), the Dan David Prize in Materials Science (2005), the Albany Medical Center Prize in Medicine and Biomedical Research (2005), the largest prize in the US for medical research, induction into the National Inventors Hall of Fame (2006), the Max Planck Research Award (2008), the Prince of Asturias Award for Technical and Scientific Research (2008) and the Terumo International Prize (2012). In 1998, he received the Lemelson-MIT prize, the world's largest prize for invention for being "one of history's most prolific inventors in medicine." In 1989 Dr Langer was elected to the Institute of Medicine of the National Academy of Sciences, and in 1992 he was elected to both the National Academy of Engineering and to the National Academy of Sciences, and in 2012 he was elected to the National Academy of Inventors.

Forbes Magazine (1999) and Bio World (1990) have named Dr Langer as one of the 25 most important individuals in biotechnology in the world. Discover Magazine (2002) named him as one of the 20 most important people in this area. Forbes Magazine (2002) selected Dr Langer as one of the 15 innovators worldwide who will reinvent our future. Parade Magazine (2004) selected Dr Langer as one of 6 "Heroes whose research may save your life." Dr Langer has received honorary doctorates from many universities, for example: Harvard University, the Mt. Sinai School of Medicine, Yale University, University of Western Ontario (Canada), Boston University and Hanyang University (South Korea). He received his Bachelor's Degree from Cornell University in 1970 and his Sc.D. from the Massachusetts Institute of Technology in 1974, both in Chemical Engineering.

### Kazemi Prize Winner, 2016

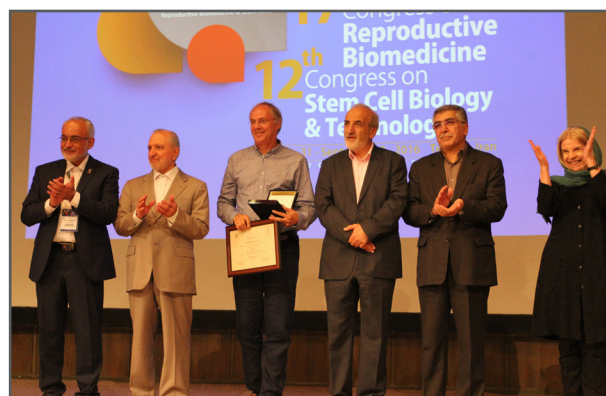
**Hans Clevers**

**Hubrecht Institute**

Johannes Carolus (Hans) Clevers is a professor in molecular genetics, a geneticist, physician, medical researcher who was the first to identify stem cells in the intestine and is one of the world's leading researchers on normal stem cells and their potential for regenerative therapy.

To summarize his scientific highlights, Hans Clevers identified the crucial downstream component of the Wnt signaling cascade, TCF, and the mechanism by which Wnt signals activate specific TCF target genes. He was the first to link Wnt signaling with adult stem cell biology, when he showed that TCF4 gene disruption leads to the abolition of crypt stem cell compartments of the gut. Clevers's team worked on the intestine and on the physiology of the intestine, which was essentially an unstudied field as well.

Clevers has been recognized on a number of occasions for his research; he was elected as an EMBO



member in 1999 and also elected as a Royal Netherlands Academy of Arts and Sciences member in 2000 and won the Catharijne-prize for medical science. He received the Spinoza Prize (Netherlands) from the European Society for Clinical Investigation in 2001 and the Louis-Jeantet Prize for Medicine (Switzerland) in 2004 and he was also named Chevalier of the Légion d'honneur (France). In 2005 he got the Science and Society Prize from Memorial Sloan-Kettering Katharine Berkan Judd Award (U.S.). He had Josephine Nefkens Prize for Cancer Research from Erasmus MC Rotterdam (Netherlands) and Meyenburg Cancer Research Award (Germany) in 2008. He received the Dutch Cancer Society Award in 2009, the United European Gastroenterology Federation (UEGF) Research Prize in 2010, and the Ernst Jung Prize for Medicine from the Jung Foundation for Science and Research (Germany) in 2011. Léopold Griffuel Prize from Association pour la Recherche sur le Cancer (France), Kolff Prize, Knight of the Order of the Netherlands Lion (Netherlands), William Beaumont Prize of the American Gastroenterology Association and Dr A.H. Heineken Prize for Medicine (Netherlands) went to him in 2012 and the Breakthrough Prize in Life Sciences in 2013. In 2014 he received Massachusetts General Hospital Award in Cancer Research, had the TEFAF Oncology Chair, became a fellow of the AACR Academy and got Struyvenberg European Society for Clinical Investigation (ESCI) medal. In 2015 he received ISS-CR-McEwen Award for Innovation and the Royal Netherlands Academy of Arts and Sciences Professor Prize in 2016.

#### **Kazemi Prize Winner, 2018**

**Michele De Luca**

**University of Modena and Reggio Emilia**

Michele De Luca is Full Professor of Biochemistry, University of Modena and Reggio Emilia, and Director of the Centre for Regenerative Medicine of the same University. He is Scientific Director of Holostem Therapie Avanzate S.r.l.

Prof De Luca was Scientific Director of the Veneto Eye Bank Foundation (2002-2007), Director of the Laboratory of Tissue Engineering at the Istituto Dermopatico dell'Immacolata, Rome (1996-2002), adjunct Professor of Cell Biology of the Medical School of Tor Vergata University, Rome (1998-2000), Deputy Head, Laboratory of Cell Differentiation, Istituto Nazionale per la Ricerca sul Cancro, Genova (1992-1995), Group Leader in the same Institute (1986-1992), Visiting Scientist at the Department of Cell Biology, Harvard Medical School, Boston (1985), Fogarty Fellow at the National Institutes of Arthritis, Diabetes, Digestive and Kidney Diseases (NIADDK), National Institutes of Health (NIH), Bethesda (1982-1985). He graduated MD in 1980 and obtained a Specialty in Endocrinology in 1984. He is founding member of International Ocular Surface Society, member of numerous scientific societies and member of national and international committees. He is author of more than 110 scientific publications in major international journals and author of 4 international patents. He was invited lecturer in more than 120 international meetings and symposia. He is currently coordinating several ex-vivo epidermal stem cell-mediated combined cell and gene therapy clinical trials for genetic skin diseases as Epidermolysis Bullosa. During these studies, Michele De Luca and Graziella Pellegrini reported lifesaving regeneration of the entire human epidermis of a Junctional EB patient by means of transgenic epidermal stem cells. He was born in Savona, Italy, May, 17, 1956.



# 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.





# 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:** **Wei-hau 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 Rate in 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-Protamine-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 Salpingoovulysis. 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





## The Fourth

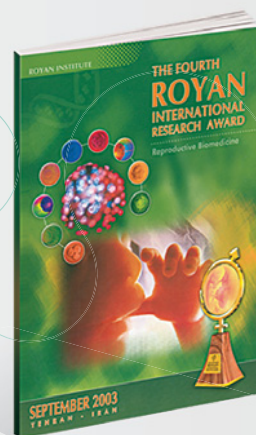
# ROYAN



**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

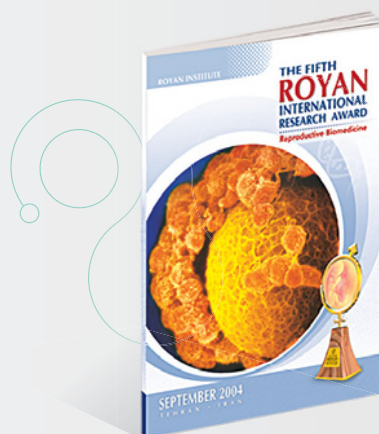


### International Research Award

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, Oogenesis: 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



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23



## 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 Testosterone Replacement Therapy

### Iranian Winners:

- **Seyed Javad Mowla**  
The Profile of Gene Expression Changes During the Neural Differentiation of Bone Marrow Stromal Cells (BMSCs)
- **Jaleh Zolghadri**  
Pregnancy Outcome Following Laparoscopic Tubal Ligation of Hydrosalpinx Tube in Patients with Early Recurrent Abortion



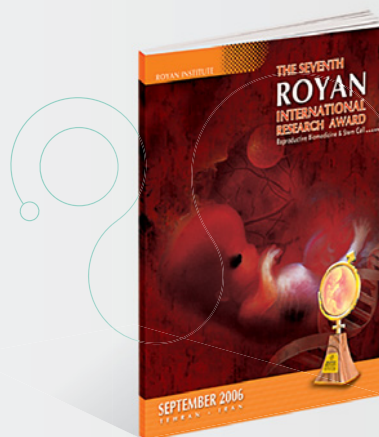
## The Seventh

# ROYAN

**International Research Award**  
Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 7



**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  
Apoptosis of Ejaculated Human Sperm Is Induced by Co-Incubation with Chlamydia Trachomatis Lipopolysaccharide
- **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





## The Eighth

# ROYAN

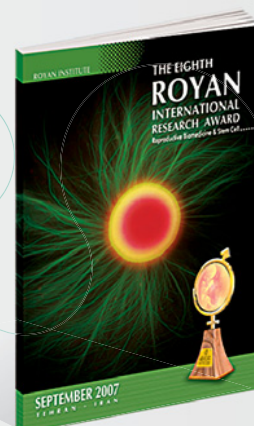
### International Research Award

Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 8

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

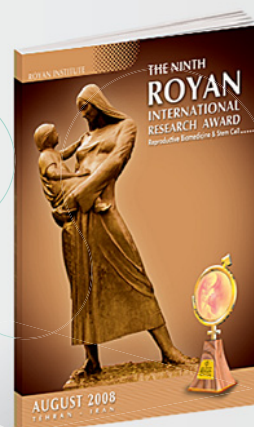


### International Research Award

Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 9



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





## The Tenth

# ROYAN



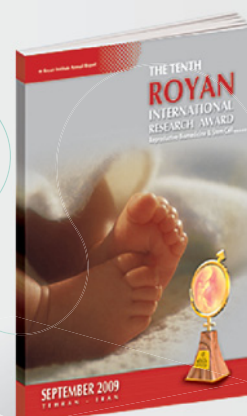
### International Research Award

Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 10

## 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



# 11

## 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 Piryaee**  
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

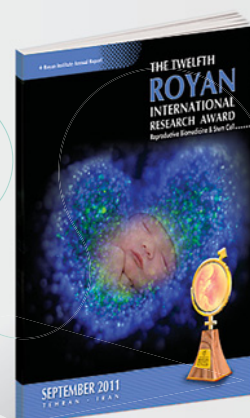
## International Research Award

Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 12

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



# 13

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**  
Interactome 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

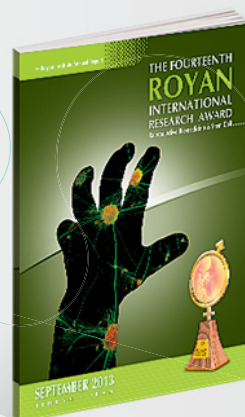
### International Research Award

Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 14

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



# 15

## 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



# 16

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 Potential 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



# 17

## 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



ROYAN  
Institute



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## The Eighteenth

# ROYAN

### International Research Award

Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 18

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

- **Saverio Bellusci**, 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 1<sup>st</sup> 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 Fouladi Nashta**, 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





## The Twentieth

# ROYAN

**International Research Award**  
Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 20

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





## The Twenty-Frist

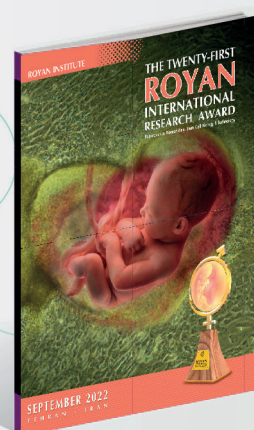
# ROYAN

International Research Award  
Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 21

September 2022



### National Winners:

Stem Cell Biology and Technology

- **Mehdi Jaymand**  
Electrically Conductive Scaffolds for Tissue Engineering: Advantages, Challenges, and Perspectives
- **Iman Shabani**  
Development of Bioactive Dopants to Design PANI-Based Conductive Scaffolds for Tissue Engineering Applications

Reproductive Biomedicine

- **Marziyeh Tavalaei**  
Could Artificial Oocyte Activation Following ICSI Improve Fertilization and Pregnancy in Couples with Male Factor Infertility

### Selected Iranian Scientist

Stem Cell Biology and Technology

- **Omid Mashinchian**, Switzerland  
An Engineered Multicellular Stem Cell Niche for Studying Disease, Aging and Regeneration

Reproductive Biomedicine

- **Ali Honaramooz**, Canada  
The Application of Animal Models in Preservation of Male Fertility



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## The Twenty-Second

# ROYAN

### International Research Award

Reproductive Biomedicine, Stem Cell  
Biology & Technology



# 22

September 2023



### National Prominent Senior Scientists

Stem Cell Biology and Technology

- **Seyed Ali Malek-Hosseini**

Biotechnology

- **Fereidoun Mahboudi**

Reproductive Biomedicine

- **Abbas Aflatoonian**

### National Prominent Junior Scientists

Stem Cell Biology and Technology

- **Seyed Ehsan Enderami**

Reproductive Biomedicine

- **Amir Fattahi**

Biotechnology

- **Esmail Mirzaie**



# Royan Award Board

## JURIES

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

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





## JURIES ...

Last Name, First Name, Degree	Country
<b>Sawamoto</b> , Kazunobu, PhD	Japan
<b>Shahhoseini</b> , Maryam, PhD	Iran
<b>Shiri</b> , Zahra, PhD	Iran
<b>Singh</b> , Rita, PhD	India
<b>Siniscalco</b> , Dario, ChemD, PhD	Italy
<b>Taee</b> , Adeleh, PhD	Iran
<b>Taghiyar</b> , Leila, PhD	Iran
<b>Tahamtani</b> , Yaser, PhD	Iran
<b>Taheri Panah</b> , Robabeh, MD	Iran
<b>Thorn</b> , Petra, PhD	Germany

Last Name, First Name, Degree	Country
<b>Vahdat</b> , Sadaf, PhD	Iran
<b>Varzideh</b> , Fahimeh, PhD	USA
<b>Vosough</b> , Massoud, PhD	Iran
<b>Zafarani</b> , Fatemeh, PhD Student	Iran
<b>Zahedi Anaraki</b> , Farzaneh, MD	Iran
<b>Zamani</b> , Mahdi, PhD	Iran
<b>Zamanian</b> , Mohammadreza, MD, PhD	Iran
<b>Zandieh</b> , Zahra, PhD	Iran
<b>Zarei Moradi</b> , Shabnam, PhD	Iran
<b>Zhao</b> , Jianguo, PhD	China





# Royan Award Board

## SCIENTIFIC BOARD

Last Name, First Name, Degree	Country
<b>Abroun</b> , Saeid, PhD, Post Doct	Iran
<b>Aflatoonian</b> , Abbas, MD	Iran
<b>Aflatoonian</b> , Reza, MD, PhD	Iran
<b>Afsharian</b> , Parvaneh, PhD	Iran
<b>Aghdami</b> , Nasser, MD, PhD	Iran
<b>Aitken</b> , R. J., PhD, ScD, FAHMS, FRSN, FRSE, FAA	Australia
<b>Alborzi</b> , Saeed, MD	Iran
<b>Aleyasin</b> , Ashraf, MD	Iran
<b>Al-Hasani</b> , Safaa, DVM, PhD	Germany
<b>Alini</b> , Mauro, PhD	Switzerland
<b>Alizadeh Moghadam Masouleh</b> , Ali Reza, PhD	Iran
<b>Almadani</b> , Seyed Navid, MD	Iran
<b>Almstrup</b> , Kristian, PhD	Denmark
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<b>Ao</b> , Asangla, PhD	Canada
<b>Arefi</b> , Soheila, MD	Iran
<b>Ashrafi</b> , Mahnaz, MD	Iran
<b>Azin</b> , Seyed Ali, MD, PhD, FECSM	Iran
<b>Bagheri Lankarani</b> , Narges, PhD	Iran
<b>Baharvand</b> , Hossein, PhD	Iran
<b>Balasinor</b> , Nafisa, PhD	India
<b>Basiri</b> , Mohsen, PhD	Iran
<b>Benagiano</b> , Giuseppe, MD, PhD, FACOG, FICOG, FRCOG	Switzerland
<b>Breitkotf</b> , Daniel, MD	USA
<b>Brivanlou</b> , Ali H., PhD	USA
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<b>Chieffi</b> , Paolo MD, PhD	Italy
<b>Clevers</b> , Hans, PhD	Netherlands
<b>Colpi</b> , Giovanni M., MD	Switzerland
<b>Dadkhah</b> , Farid, MD	Iran
<b>Daemi</b> , Hamed, PhD	Iran
<b>Dalman</b> , Azam, PhD	Iran
<b>De Geyter</b> , Christian, MD	Switzerland
<b>De Luca</b> , Michele, PhD	Italy
<b>Ebner</b> , Thomas, PhD	Austria
<b>Ebrahimi</b> , Bitra, PhD	Iran
<b>Ebrahimi</b> , Marzieh, PhD	Iran
<b>Eimani</b> , Hussein, PhD	Iran
<b>Engin</b> , Gulgun, MD	Turkey
<b>Eshrati</b> , Babak, PhD	Iran
<b>Evans</b> , John, PhD	New Zealand
<b>Fan</b> , Guoping, PhD	USA
<b>Farrahi</b> , Faramarz, MD	Iran

Last Name, First Name, Degree	Country
<b>Farzadi</b> , Laya, MD	Iran
<b>Fathi</b> , Fardin, PhD	Iran
<b>Ferrara</b> , James L.M., MD, DSc	USA
<b>Geraedts</b> , Joep, PhD	Netherlands
<b>Ghafari</b> , Firoozeh, MD	Iran
<b>Gheisari</b> , Yousof, MD, PhD	Iran
<b>Gourabi</b> , Hamid, PhD	Iran
<b>Greening</b> , David, PhD	Australia
<b>Haghighat Khah</b> , Hamidreza, MD	Iran
<b>Hajizadeh</b> , Ensiyeh, PhD	Iran
<b>Hamidieh</b> , Amir Ali, MD	Iran
<b>Hassani</b> , Seyedeh Nafiseh, PhD	Iran
<b>Hens</b> , Kristien, PhD	Netherlands
<b>Honaramooz</b> , Ali, DVM, PhD	Canada
<b>Hosseini</b> , Ahmad, PhD	Iran
<b>Hosseini</b> , Jalil, MD	Iran
<b>Hosseini</b> , Roya, MD	Iran
<b>Jaenisch</b> , Rudolf, MD	USA
<b>Johnson</b> , Martin, PhD	UK
<b>Kalantar</b> , Seyed Mehdi, PhD	Iran
<b>Kamali</b> , Koorosh, MD, MPH, PhD	Iran
<b>Kamali</b> , Mohammad, PhD	Iran
<b>Karimian</b> , Leila, MSc	Iran
<b>Karimzadeh Meybodi</b> , Mohammad Ali, MD	Iran
<b>Kazemeyni</b> , Seyed Mohammad, MD	Iran
<b>Khademhosseini</b> , Ali, PhD	USA
<b>Khalili</b> , Mohammad Ali, PhD	Iran
<b>Khochbin</b> , Saadi, PhD	France
<b>Kiani</b> , Sahar, PhD	Iran
<b>Kim</b> , Jeong Beom, PhD	Korea
<b>Kirkeby</b> , Agnete, PhD	Denmark
<b>Kupesic Plavsic</b> , Sanja, MD	USA
<b>L. Herrera</b> , Pedro, MD	Switzerland
<b>Langer</b> , Robert S., PhD	USA
<b>Larijani</b> , Bagher, MD	Iran
<b>Madani</b> , Tahereh, MD	Iran
<b>McElreavey</b> , Kenneth, PhD	France
<b>Milanifar</b> , Alireza, PhD	Iran
<b>Moein</b> , Mohammad Reza, MD	Iran
<b>Moghaddam Matin</b> , Maryam, PhD	Iran
<b>Mohseni Meybodi</b> , Anahita, PhD	Iran
<b>Moini</b> , Ashraf, MD	Iran
<b>Momtabaz</b> , Mohamed, MB, BCh, MSc, MD	Egypt





## SCIENTIFIC COMMITTEE ...

Last Name, First Name, Degree	Country
<b>Monsees</b> , T.K. , PhD	South Africa
<b>Mosavifar</b> , Nezhat, MD	Iran
<b>Movahedin</b> , Mansoureh, PhD	Iran
<b>Movassagh</b> , Hooman, LLB, LLM, PhD	USA
<b>Mowla</b> , Seyed Javad, PhD	Iran
<b>Mozdarani</b> , Hossein, PhD	Iran
<b>Mozdziak</b> , Paul, PhD	USA
<b>Mukhopadhyay</b> , Asok, PhD	India
<b>Namazi</b> , Hamidreza, MD, PhD	Iran
<b>Nasr-Esfahani</b> , Mohammad Hossein, PhD	Iran
<b>Nematollahi-mahani</b> , Seyed Nouredin, PhD	Iran
<b>Newgreen</b> , Don, PhD, BScHons	Australia
<b>Nielsen</b> , Hans Ingolf, PhD, MEd, MSc	Denmark
<b>Nottola</b> , Stefania, MD, PhD	Italy
<b>Nowroozi</b> , Mohammad Reza, MD	Iran
<b>Nussler</b> , Andreas, PhD	Germany
<b>Oback</b> , Björn, PhD	New Zealand
<b>Omani Samani</b> , Reza, MD, PhD	Iran
<b>Pahlavan</b> , Sara, PhD	Iran
<b>Parsanezhad</b> , Mohammad Ebrahim, MD	Iran
<b>Parte</b> , Priyanka, PhD	India
<b>Piemonti</b> , Lorenzo, MD	Italy
<b>Ping Lu</b> , Kun, MD , PhD	USA
<b>Piryaei</b> , Abbas, PhD	Iran
<b>Pourmand</b> , Gholamreza, MD	Iran
<b>Puri</b> , Chander P., PhD, FAMS, FNASc	India
<b>Ramalho-Santos</b> , Miguel, PhD	Canada
<b>Ramezanzadeh</b> , Fatemeh, MD	Iran
<b>Rashidi</b> , Batool, MD	Iran
<b>Rastegar</b> , Mojgan, PhD, DEA	Canada
<b>Ray</b> , Pierre F, PhD	France
<b>Rezazadeh</b> , Mojtaba, PhD	Iran
<b>Rostami</b> , Sirous, MD	Iran
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<b>Sabeti</b> , Shokofeh, MD	Iran
<b>Sabour</b> , Davood, PhD	Iran
<b>Sadeghi</b> , Mohamad Reza, PhD	Iran
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<b>Sadri- Ardakani</b> , Hooman, MD, PhD	USA
<b>Saeidi</b> , Hojjatollah, PhD	Iran
<b>Salamati</b> , Masoumeh, MD	Iran

Last Name, First Name, Degree	Country
<b>Salehnia</b> , Mojdeh, PhD	Iran
<b>Salehpour</b> , Saghar, MD	Iran
<b>Sanati</b> , Mohammad Hossein, PhD	Iran
<b>Saric</b> , Tomo, MD, PhD	Germany
<b>Sawamoto</b> , Kazunobu, PhD	Japan
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<b>Schoeler</b> , Hans R., PhD	Germany
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<b>Silber</b> , Sherman, MD	USA
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<b>Tahmasebpour</b> , Ahmadrza, MD	Iran
<b>Tardif</b> , Steve, PhD	USA
<b>Tarzamni</b> , Mohammad Kazem, MD	Iran
<b>Tavalaee</b> , Marziyeh, PhD	Iran
<b>Tehranejad</b> , Ensieh, MD	Iran
<b>Thomson</b> , Jeremy, BSc (Hons), PhD	Australia
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<b>Tian</b> , Xiuchun Cindy, PhD	USA
<b>Totonchi</b> , Mehdi, PhD	Iran
<b>Vahidi</b> , Serajoddin, MD	Iran
<b>van der Horst</b> , Gerhard, PhD	South Africa
<b>Vosough</b> , Massoud, MD, PhD	Iran
<b>Vosough Taghi Dizaj</b> , Ahmad, MD	Iran
<b>Wang</b> , Dong-An, PhD	Singapore
<b>Weichert</b> , Alexander, MD, PhD	Germany
<b>Woodruff</b> , Teresa K, PhD	USA
<b>Zahedi Anaraki</b> , Farzaneh, MD	Iran
<b>Zamani</b> , Mahdi, PhD	Iran
<b>Zamanian</b> , Mohammadreza, MD, PhD	Iran
<b>Zhao</b> , Jianguo, PhD	China
<b>Zolghadri</b> , Jaleh, MD	Iran

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# ROYAN INSTITUTE



[www.royan.org](http://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 Covid19- 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 Tabatabaie 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"- Science and Technology Prize, 2010
- Earning The World Academy of Science "TWAS" Prize, 2019
- Gaining the 32<sup>nd</sup> 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 ever
- 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

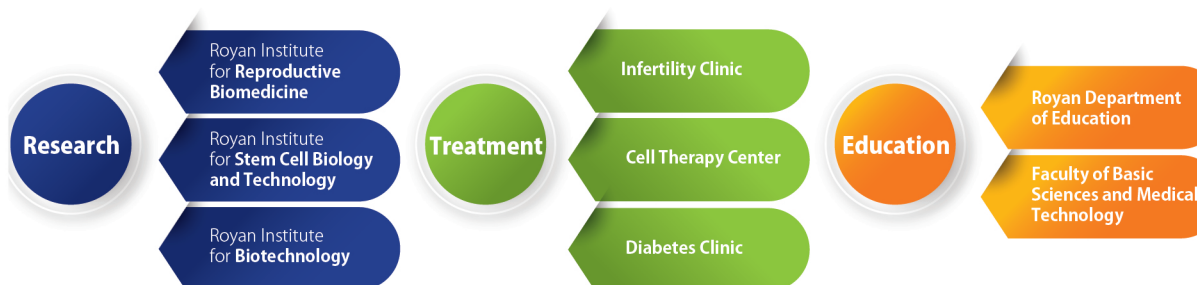
## Main Activities

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



## ROYAN INSTITUTE







## 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 (2024)

1-Ghasemi Z, Alizadeh Mogadam Masouleh A, Rashki Ghaleno L, Akbarinejad V, Rezazadeh Valojerdi M, Shahverd Maternal nutrition and fetal imprinting of the male progeny. *Anim Reprod Sci.* 2024 Jun;265:107470

2-Rashki Ghaleno L, Pennisi CP, Shahverdi A, Dardmeh F, Alipour H, Rezazadeh Valojerdi M. xploring the Role Hyaluronic Acid in Reproductive Biology and Beyond: Applications in Assisted Reproduction and Tissue Engineeri *Adv Biol (Weinh).* 2024 Jun;8(6):e2300621.

3-Jahangiri AR, Ziarati N, Dadkhah E, Bucak MN, Rahimizadeh P, Shahverdi A, Sadighi Gilani MA, Topraggaleh Microfluidics: The future of sperm selection in assisted reproduction. *Andrology.* 2024 Sep;12(6):1236-1252.

4-Palay P, Fathi D, Saffari H, Hassani F, Hajiaghalou S, Fathi R. Simple bioelectrical microsensor: oocyte quality prec tion via membrane electrophysiological characterization. *Lab Chip.* 2024 Aug 6;24(16):3909-3929.

5-Baharsaadi M, Hezavehei M, Shahverdi A, Halvaei I. Evaluation of the effects of hydroxytyrosol on human spe parameters during cryopreservation. *Cryobiology.* 2024 Mar;114:104840.

6-Pargoo SS, Baniasadi F, Jasemi VSK, Hajiaghalou S, Gharanfoli M, Fathi R. Effect of Moderate Static Magnetic Fie on Mice Oocyte Vitriification: Calcium-Related Genes Expression. *Biopreserv Biobank.* 2024 Mar 25.

7-Najafi Salehi J, Eimani H, Shahverdi A, Totonchi M, Fathi R, Moosavi SA, Taher Mofrad SMJ, Tahaei LS. Improvem of Mouse Preantral Follicle Survival and Development following Co-Culture with Ovarian Parenchyma Cell Suspi sion. *Int J Fertil Steril.* 2024 Feb 2;18(2):153-161.

8-Amjad F, Keshvari H, Dalman A, Montazeri L. In Vitro Development of Mouse Preantral Follicle with Using Amnic Membrane Extract-Loaded Hydrogels. *Int J Fertil Steril.* 2024 Jun 9;18(3):286-292.

9-Hashemi SH, Hafezi M, Arabipoor A, Zareei M, Vesali S, Eftekhari-Yazdi P. Can We Harvest More Mature Oocytes Repeating Gonadotropin-Releasing Hormone Agonist Doses in Polycystic Ovarian Syndrome Patients at Risk of Of in Antagonist Cycles? A Randomised Clinical Trial. *Int J Fertil Steril.* 2024 Jul 13;18(Suppl 1):48-54.

10-Mirbahari SN, Amorim CA, Hassani F, Totonchi M, Haddadi M, Valojerdi MR, Dalman A. In-vitro generation follicle-like structures from human germ cell-like cells derived from theca stem cell combined with ovarian soma cells. *J Ovarian Res.* 2024 Jan 2;17(1):2.



## 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 (2024)

1-Arabipoor A, Moini A, Nabavi SM, Mohiti S, Mashayekhi M, Zolfaghari Z. Evaluation of ovarian reserve and the assisted reproductive technology (ART) cycles' outcome as well as the relapse rate within one year after ART in women with multiple sclerosis: a case-control study. *J Ovarian Res.* 2024 Aug 13;17(1):165.

2-Hafezi M, Arabipoor A, Ghaffari F, Vesali S, Zareei M, Hessari ZH. Adding L-carnitine to antagonist ovarian stimulation doesn't improve the outcomes of IVF/ ICSI cycle in patients with polycystic ovarian syndrome: a double-blind randomized. *J Ovarian Res.* 2024 Jan 9;17(1):9

3-Varnosfaderani AS, Kalantari S, Ramezani F, Shahhoseini M, Amirchaghmaghi E. Increased Gene Expression of LITAF, TNF- $\alpha$  and BCL6 in Endometrial Tissues of Women with Endometriosis: A Case-Control Study. *Cell J.* 2024 May 7;26(4):243-249.

4-Madani T, Jahangiri N, Moosavisadat SM, Mirzaagha E, Maroufizadeh S, Irani S, Ahmadi F. Association between Myometrial Thickness and Assisted Reproductive Technologies Outcomes: A Prospective Cohort Study. *Int J Fertil Steril*. 2024 Feb 2;18(2):123-127.

5-Tanhaye Kalate Sabz F, Hosseini E, Amjadi FS, Mohammadian M, Zandieh Z, Mohammadian F, Kafaieinezhad R, Ashrafi M. In vitro effect of granulocyte-macrophage colony-stimulating factor (GM-CSF) on the expression of genes related to sperm motility and energy metabolism and intracytoplasmic sperm injection outcomes in obstructive azoospermic patients. *Mol Biol Rep*. 2024 Jun 11;51(1):727.

6-Darabi N, Mashayekhy M, Borjian Boroujeni P, Mohtasebi P, Rokhsat Talab Z, Zamanian MR. APOE-E4 allele as a potential marker for implantation failure: A comparison between fertile women, ART success and RIF patients. *Int J Gynaecol Obstet*. 2024 Apr 15.

7-Hashemi SH, Hafezi M, Arabipoor A, Zareei M, Vesali S, Eftekhari-Yazdi P. Can We Harvest More Mature Oocytes by Repeating Gonadotropin-Releasing Hormone Agonist Doses in Polycystic Ovarian Syndrome Patients at Risk of OHSS in Antagonist Cycles? A Randomised Clinical Trial. *Int J Fertil Steril*. 2024 Jul 13;18(Suppl 1):48-54.

8-Yahyaei A, Moridi M, Ghaffari F. Controlled ovarian stimulation in cancer patients under 18 years old; a case series. *J Ovarian Res*. 2024 Feb 5;17(1):33.

9-Aghajanpour S, Mehraein F, Amjadi F, Zandieh Z, Ghaffari F, Aflatoonian K, Hosseini E, Bakhtiyari M, Aflatoonian R. Endometrial scratching in unexplained repeated implantation failure causes two competing forces, angiogenesis and anti-angiogenesis: An RCT study. *Int J Reprod Biomed*. 2024 Jun 12;22(4):253-268.

10-Heidarzadeh-Esfahani N, Heshmati J, Pirjani R, Moini A, Shafaatdoost M, Esmaeili M, Mardi-Mamaghani A, Nachvak SM, Sepidarkish M. The potential causal effect of the pre-pregnancy dietary phytochemical index on gestational diabetes mellitus: a prospective cohort study. *BMC Pregnancy Childbirth*. 2024 Jun 28;24(1):447.

## 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

## 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 dysfunction and ejaculation disorders
- Studying the etiology of abnormal semen parameters

## Selected Articles (2024)

1-Ghayda RA, Cannarella R, Calogero AE, Shah R, Rambhatla A, ..... Sabbaghian M, ..... Colpi G, Agarwal A; Global Andrology Forum. Artificial Intelligence in Andrology: From Semen Analysis to Image Diagnostics. World J Mens Health. 2024 Jan;42(1):39-61.

2-Zandiyeh S, Kalantari H, Fakhri A, Nikkhah M, Janani BJ, Sabbaghian M. A review of recent developments in the application of nanostructures for sperm cryopreservation Cryobiology. 2024 Jun;115:104890.

3-Jahangiri AR, Ziarati N, Dadkhah E, Bucak MN, Rahimizadeh P, Shahverdi A, Sadighi Gilani MA, Topraggaleh TR. Microfluidics: The future of sperm selection in assisted reproduction .Andrology. 2024 Sep;12(6):1236-1252.





4-Shah R, Rambhatla A, ..., Sajjadi H, ..., Agarwal A; . Global Practice Patterns in the Evaluation of Non-Obstructive Azoospermia: Results of a World-Wide Survey and Expert Recommendations. World J Mens Health. 2024 Apr

5-Kalantari H, Sabbaghian M, Vogiatzi P, Colpi GM, Sadighi Gilani MA. New Insights beyond Established Norms: A Scoping Review of Genetic Testing for Infertile Men. Urol J. 2024 Jun 9;21(4):200-207.

6-Piryaei F, Mehta P, Mozdarani H, Hamzehlooy F, Barati M, Piryaei Z, Gilani MAS, Alemi M, Singh R. Testicular piRNA Analysis Identified Dysregulated piRNAs in Non-obstructive Azoospermia. Reprod Sci. 2024 May;31(5):1246-1255.

7-Poursafari Talemi E, Hosseini SH, Gourabi H, Sabbaghian M, Mohseni Meybodi A. Evaluation of The 1499T>C Variant in The AKAP3 Gene of Infertile Men with Multiple Morphological Abnormalities of The Sperm Flagella Phenotype: A Case-Control Study. Int J Fertil Steril. 2024 Feb 2;18(2):180-184.

8-Arasteh H, Gilani MAS, Ramezani-Binabaj M, Babaei M. Microdissection testicular sperm extraction outcomes in azoospermic patients with bilateral orchidopexy. Andrology. 2024 Jan;12(1):157-163.

9-Amiri-Yekta A, Sen S, Hazane-Puch F, Tebbakh C, Roux-Buisson N, Cazin C, Thierry-Mieg N, Bouras A, Mohammad Ali SG, Hosseini SH, Goodarzian M, Gourabi H, Ray PF, Kherraf ZE. Whole genome sequencing identifies a homozygous splicing variant in TDRKH segregating with non-obstructive azoospermia in an Iranian family. Clin Genet. 2024 Jul 2.

10-Haratian K, Borjian Boroujeni P, Sabbaghian M, Maghareh Abed E, Moazenchi M, Mohseni Meybodi A. DEFB126 2-nt Deletion (rs11467417) as a Potential Risk Factor for Chlamydia Trachomatis Infection and Subsequent Infertility in Iranian Men. J Reprod Infertil. 2024 Jan-Mar;25(1):20-27.

## 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 (2024)

1- Muronová J, Kherraf ZE, ..., Amiri-Yekta A, ..., Ray PF, Arnoult C. Lack of CCDC146, a ubiquitous centriole and microtubule-associated protein, leads to non-syndromic male infertility in human and mouse. *Elife*. 2024 Mar 5;12:RP86845

2- Darabi N, Mashayekhy M, Borjian Boroujeni P, Mohtasebi P, Rokhsat Talab Z, Zamanian MR. APOE-E4 allele as a potential marker for implantation failure: A comparison between fertile women, ART success and RIF patients. *Int J Gynaecol Obstet*. 2024 Apr 15

3- Najafi Salehi J, Eimani H, Shahverdi A, Totonchi M, Fathi R, Moosavi SA, Taher Mofrad SMJ, Tahaei LS. Improvement of Mouse Preantral Follicle Survival and Development following Co-Culture with Ovarian Parenchyma Cell Suspension. *Int J Fertil Steril*. 2024 Feb 2;18(2):153-161

4- Motiee B, Mousavi SOR, Eslami M, Eftekhari-Yazdi P, Hassani F, Bazrgar M. Upregulation of Oxidative Phosphorylation Genes in Cumulus Cells of The Polycystic Ovary Syndrome Patients with or without Insulin Resistance. *Cell J*. 2024 May 7;26(4):235-242

5- Amiri-Yekta A, Sen S, Hazane-Puch F, Tebbakh C, Roux-Buisson N, Cazin C, Thierry-Mieg N, Bouras A, Mohammad Ali SG, Hosseini SH, Goodarzian M, Gourabi H, Ray PF, Kherraf ZE. Whole genome sequencing identifies a homozygous splicing variant in TDRKH segregating with non-obstructive azoospermia in an Iranian family. *Clin Genet*. 2024 Jul 2

6- Nasir Shirazi M, Sarikhan S, Ghafouri H, Amirmojahedi H, Shahzadeh Fazeli SA, Amoozegar MA. Recombinant Expression and Functional Assessment of Uricase from a Pertinent Origin of the Enzyme, *Streptomyces* sp. Strain 17-1. *Iran J Biotechnol*. 2024 Jan 1;22(1):e3602

7- Khademi NS, Farivar S, Bazrgar M, Hassani SN, Masoudi NS, Haghparast N, Rezaei Larijani M. Aneuploidy Rate and Stemness in Low-Level Mosaic Human Embryonic Stem Cells in the Presence/Absence of Bortezomib, Paclitaxel, and Lapatinib. *Cells Tissues Organs*. 2024;213(1):17-23

8- Varnosfaderani AS, Kalantari S, Ramezanali F, Shahhoseini M, Amirchaghmaghi E. Increased Gene Expression of LITAF, TNF- $\alpha$  and BCL6 in Endometrial Tissues of Women with Endometriosis: A Case-Control Study. *Cell J*. 2024 May 7;26(4):243-249

9- Khajedehe N, Fathi R, Akbarinejad V, Gourabi H. Oocyte Vitrification Reduces its Capability to Repair Sperm DNA Fragmentation and Impairs Embryonic Development. *Reprod Sci*. 2024 May;31(5):1256-1267.

10- Adhami S, Sheikhan M, Fathi R, Zamanian M, Shaverdi A, Afsharian P, Baharvand H, Taghiyar L, Satarian L. Exploring Advances in Reproduction and Stem Cell Biology: Highlights from The 24(th) and 19(th) International Congresses in Iran. *Cell J*. 2024 Aug 11;26(6):398-402.

## 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 hysterosonography 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 (2024)

- 1-Hosseini F, Pahlavan F, Ahmadi F. The categorization of opaque pathologies outside of contrast media in hysterosalpingography which facilitate interpretation: A pictorial review. *Int J Reprod Biomed*. 2024 May 15;22(3):191-202.
- 2-Madani T, Jahangiri N, Moosavisadat SM, Mirzaagha E, Maroufizadeh S, Irani S, Ahmadi F. Association between Myometrial Thickness and Assisted Reproductive Technologies Outcomes: A Prospective Cohort Study. *Int J Fertil Steril*. 2024 Feb 2;18(2):123-127.
- 3-Abbasihormozi S, Shirin A, Hosseini R, Moayed M, Taghi Dizaj AV, Afghan M, Kouhkan A, Vesali S. COVID-19-related fear and anxiety in a sample of patients with type 2 diabetes: a cross-sectional study in Iran after several peaks of the pandemic. *J Diabetes Metab Disord*. 2024 Feb 14;23(1):789-796.
- 4-Barekatrezaei S, Kozegar E, Salamati M, Soryani M. Mass detection in automated three dimensional breast ultrasound using cascaded convolutional neural networks. *Phys Med*. 2024 Aug;124:103433.







## 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.

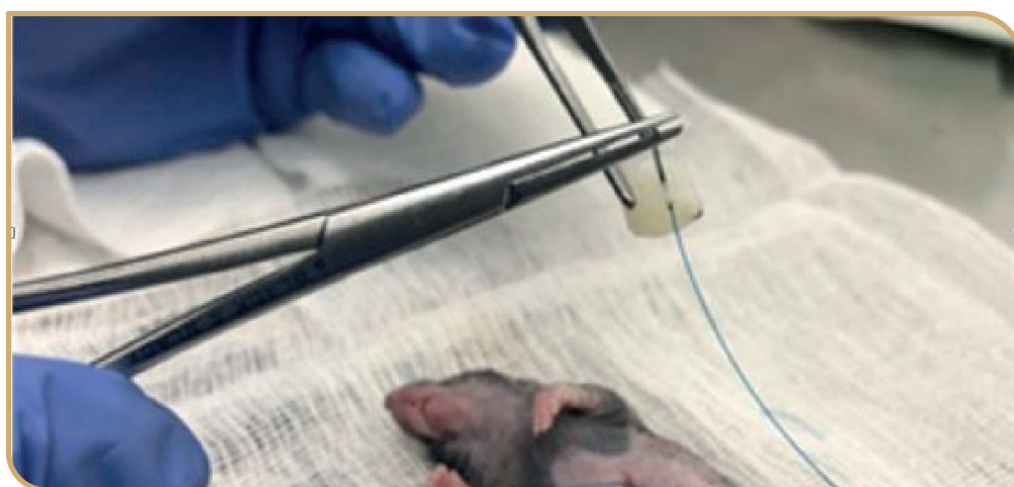
The vision of RI-SCBT is to efficiently translate stem cell research findings into application in treatment of disorders with the aim of improving health. The mission of RI-SCBT is to generate insights into the biology of stem cells through basic research and to provide the foundation needed for novel 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 differentiation Transdifferentiation 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 (2024)

1-Rezaei Zonooz E, Ghezelayagh Z, Moradmamand A, Baharvand H, Tahamtani Y. Protocol-Dependent Morphological Changes in Human Embryonic Stem Cell Aggregates during Differentiation toward Early Pancreatic Fate. *Cells Tissues Organs*. 2024;213(3):223-234

2-Firoozi S, Pahlavan S, Ghanian MH, Rabbani S, Tavakol S, Barekat M, Yakhkeshi S, Mahmoudi E, Soleymani M, Baharvand H. Correction: Firoozi et al. A Cell-Free SDKP-Conjugated Self-Assembling Peptide Hydrogel Sufficient for Improvement of Myocardial Infarction. *Biomolecules* 2020, 10, 205. 2024 Jun 25;14(7):751.

3-Gharatape A, Sadeghi-Abandansari H, Seifalian A, Faridi-Majidi R, Basiri M. Nanocarrier-based gene delivery for immune cell engineering. *J Mater Chem B*. 2024 Apr 3;12(14):3356-3375

4-Yaghoobi A, Rezaee M, Behnoush AH, Khalaji A, Mafi A, Houjaghan AK, Masoudkabar F, Pahlavan S. Role of long noncoding RNAs in pathological cardiac remodeling after myocardial infarction: An emerging insight into molecular mechanisms and therapeutic potential. *Biomed Pharmacother*. 2024 Mar;172:116248.

5-Bahrami M, Abbaszadeh HA, Norouzian M, Abdollahifar MA, Roozbahany NA, Saber M, Azimi M, Ehsani E, Bakhtiyari M, Serra AL, Moghadasali R. Enriched human embryonic stem cells-derived CD133(+), CD24(+) renal progenitors engraft and restore function in a gentamicin-induced kidney injury in mice. *Regen Ther*. 2024 May 7;27:506-518

6-Mohebbi S, Zoughi S, Faridbod F, Moradi S. Early fetal sex determination using a fluorescent DNA nanosensing platform capable of simultaneous detection of SRY and DYS14 sequences in cell-free fetal DNA. *Heliyon*. 2024 Jun 15;10(12):e33131

7-Nazari MHD, Heidarian R, Masoudnia M, Dastjerdi RA, Talkhounche PG, Taleahmad S. Targeting GIL1 and BAX by nanonoscaphine could impede prostate adenocarcinoma progression. *Sci Rep*. 2024 Aug 16;14(1):18977.

8-Mehryab F, Ebrahimi M, Baharvand H, Haeri A, Shekari F. Extracellular vesicle-based formulation of doxorubicin: drug loading optimization, characterization, and cytotoxicity evaluation in tumor spheroids. *Pharm Dev Technol*. 2024 Aug 6:1-11

9-Dabiri H, Habibi-Anbouhi M, Ziaei V, Moghadasali Z, Sadeghizadeh M, Hajizadeh-Saffar E. Candidate Biomarkers for Targeting in Type 1 Diabetes; A Bioinformatic Analysis of Pancreatic Cell Surface Antigens. *Cell J*. 2024 Jan 31;26(1):51-61

10-Pazhouhnia Z, Noori A, Farzin A, Khoshmaram K, Hoseinpour M, Ai J, Ebrahimi M, Lotfibakhshaiesh N. 3D-bioprinted GelMA/gelatin/amniotic membrane extract (AME) scaffold loaded with keratinocytes, fibroblasts, and endothelial cells for skin tissue engineering. *Sci Rep*. 2024 Jun 3;14(1):12670





## 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 (2024)

- 1- Faeed M, Ghiasvand M, Fareghzadeh B, Taghiyar L. Osteochondral organoids: current advances, applications, and upcoming challenges. *Stem Cell Res Ther.* 2024 Jun 21;15(1):183
- 2- Shekari F, Meyfour A, Davies OG, Velot É. Editorial: Mesenchymal stem cell-derived extracellular vesicles: considerations and therapeutic applications. *Front Cell Dev Biol.* 2024 Feb 23;12:1377197
- 3- Chalak M, Hesarak M, Mirbahari SN, Yeganeh M, Abdi S, Rajabi S, Hemmatzadeh F. Cell Immortality: In Vitro Effective Techniques to Achieve and Investigate Its Applications and Challenges. *Life (Basel).* 2024 Mar 21;14(3):417
- 4- Alizadeh S, Ameri Z, Daemi H, Pezeshki-Modaress M. Sulfated polysaccharide as biomimetic biopolymers for tissue engineering scaffolds fabrication: Challenges and opportunities. *Carbohydr Polym.* 2024 Jul 15;336:122124
- 5- Esmaeili A, Hosseini S, Baghaban Eslaminejad M. Co-culture engineering: a promising strategy for production of engineered extracellular vesicle for osteoarthritis treatment. *Cell Commun Signal.* 2024 Jan 10;22(1):29.
- 6- Tajbakhsh F, Tavana S, Ashtiani MK, Amorim CA, Fathi R. Optimal human ovarian follicle isolation: A review focused on enzymatic digestion. *Histol Histopathol.* 2024 Apr 12:18747
- 7- Zarkesh I, Movahedi F, Sadeghi-Abandansari H, Pahlavan S, Soleimani M, Baharvand H. ROS scavenging activity of polydopamine nanoparticle-loaded supramolecular gelatin-based hydrogel promoted cardiomyocyte proliferation. *Int J Biol Macromol.* 2024 Feb;259(Pt 2):129228. doi: 10.1016/j.ijbiomac.2024.129228. Epub 2024 Jan 4.
- 8- Bordbar S, Li Z, Lotfibakhshaiesh N, Ai J, Tavassoli A, Beheshtizadeh N, Vainieri L, Khanmohammadi M, Sayahpour FA, Baghaban Eslaminejad M, Azami M, Grad S, Alini M. Cartilage tissue engineering using decellularized biomatrix hydrogel containing TGF- $\beta$ -loaded alginate microspheres in mechanically loaded bioreactor. *Sci Rep.* 2024 May 25;14(1):11991

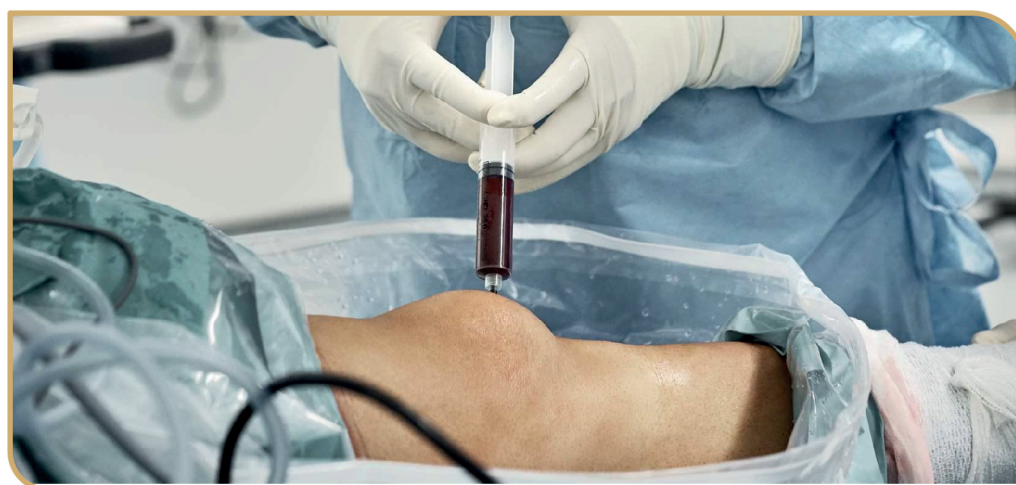
9- Soltani M, Farhadi A, Rajabi S, Homayouni-Tabrizi M, Hussein FS, Mohammadian N. Folic acid-modified nanocrystalline cellulose for enhanced delivery and anti-cancer effects of crocin. Sci Rep. 2024 Jun 17;14(1):13985

10- Shokri M, Kharaziha M, Ahmadi Tafti H, Dalili F, Mehdiavaz Aghdam R, Ghiassi SR, Baghaban Eslaminejad M. Melatonin-loaded mesoporous zinc- and gallium-doped hydroxyapatite nanoparticles to control infection and bone repair. Biomater Sci . 2024 Aug 6;12(16):4194-4210

## 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 (2024)

1-Diaz- Solano D, Sadri B, Peshkova M, Shpichka A, Smirnova O, Shams R, Timashev P, Vosough M. Advanced Therapeutic Medicinal Products in Bone and Cartilage Defects. Curr Rev Clin Exp Pharmacol. 2024;19(4):355-369

2-Ajith A, Merimi M, Arki MK, Hossein-Khannazer N, Najari M, Vosough M, Sokal EM, Najimi M. Immune regulation and therapeutic application of T regulatory cells in liver diseases. Front Immunol. 2024 Mar 20;15:1371089

3-Abtahi MS, Fotouhi A, Rezaei N, Akalin H, Ozkul Y, Hossein-Khannazer N, Vosough M. Nano-based drug delivery





systems in hepatocellular carcinoma. *J Drug Target*. 2024 Jun 18:1-19.

4-Bordbar S, Li Z, Lotfibakhshaiesh N, Ai J, Tavassoli A, Beheshtizadeh N, Vainieri L, Khanmohammadi M, Sayahpour FA, Baghaban Eslaminejad M, Azami M, Grad S, Alini M. Cartilage tissue engineering using decellularized biomatrix hydrogel containing TGF- $\beta$ -loaded alginate microspheres in mechanically loaded bioreactor. *Sci Rep*. 2024 May 25;14(1):11991

5-Dabiri H, Habibi-Anbouhi M, Ziaei V, Moghadasi Z, Sadeghizadeh M, Hajizadeh-Saffar E. CCandidate Biomarkers for Targeting in Type 1 Diabetes; A Bioinformatic Analysis of Pancreatic Cell Surface Antigens. *Cell J*. 2024 Jan 31;26(1):51-61

6- Beheshti Maal A, Shahrbafe MA, Sadri B, Hossein-Khannazer N, Mansournia MA, Vosough M. Prevalence of Hepatobiliary Manifestations in Inflammatory Bowel Disease: A GRADE Assessed Systematic Review and Meta-Analysis of more than 1.7 Million Patients. *J Crohns Colitis*. 2024 Mar 1;18(3):360-374

7- Mousavi MA, Rezaee M, Pourhamzeh M, Salari M, Hossein-Khannazer N, Shpichka A, Nabavi SM, Timashev P, Vosough M. Translational Approach Using Advanced Therapy Medicinal Products for Huntington's Disease. *Curr Rev Clin Exp Pharmacol*. 2024 May 23

8- Pazhouhnia Z, Noori A, Farzin A, Khoshmaram K, Hoseinpour M, Ai J, Ebrahimi M, Lotfibakhshaiesh N. 3D-bioprinted GelMA/gelatin/amniotic membrane extract (AME) scaffold loaded with keratinocytes, fibroblasts, and endothelial cells for skin tissue engineering. *Sci Rep*. 2024 Jun 3;14(1):12670

9- Farzanbakhsh S, Shahrbafe MA, Madani H, Dahmardei M, Sadri B, Vosough M. A single-center, open-labeled, randomized, 6-month, parallel-group study to assess the safety and efficacy of allogeneic cultured keratinocyte sheet transplantation for deep second-degree burn wounds: rationale and design of phase I/II clinical trial. *Trials*. 2024 Apr 1;25(1):226

10- Farzanbakhsh S, Amini MR, Madani H, Sadri B, Hassani SN, Fallah N, Samadian A, Aghdami R, Khalajasadi Z, Baharvand H, Vosough M, Hajizadeh-Saffar E. Safety evaluation of bi-layered allogenic keratinocyte and fibroblast skin substitute for diabetic foot ulcers -SAFESKIN-DFU: A Phase 1 clinical trial. *Diabetes Obes Metab*. 2024 Aug 19.



## 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 Plasminogen 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.

## Department of Animal Biotechnology

### Introduction

This department consists 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 (2024)

1- Aghajanoloo B, Hadady H, Ejeian F, Inglis DW, Hughes MP, Tehrani AF, Nasr-Esfahani MH.. Biomechanics of circulating cellular and subcellular bioparticles: beyond separation. *Cell Commun Signal*. 2024 Jun 17;22(1):331

2- Behtaj S, Karamali F, Najafian S, Masaeli E, Rybachuk M. Ciliary neurotrophic factor mediated growth of retinal ganglion cell axons on PGS/PCL scaffolds. *Biomed Mater*. 2024 Jan 12;19(2).

3- Pouriayeali F, Tavalaee M, Kazeminasab F, Dattilo M, Nasr-Esfahani MH. Effects of Streptozotocin Induced Diabetes on One-Carbon Cycle and Sperm Function. *Cell J*. 2024 Jan 31;26(1):81-90.





4- Mohaghegh H, Assadi Z, Derakhshan A, Masaeli E. Accelerating Full-Thickness Wound Healing with Bacterial Cellulose-Based Multilayer Composites. *J Pharm Sci.* 2024 Mar;113(3):754-763

5- Pouriayevali F, Tavalae M, Kazeminasab F, Dattilo M, Nasr-Esfahani MH. Effects of Streptozotocin Induced Diabetes on One-Carbon Cycle and Sperm Function. *Cell J.* 2024 May 7;26(4):276.

6-Salehpour S, Aleyasin A, Moini A, Mousavifar N, Mohammadhossein N, Abdollahi Fard S, Marzie S, Mohammadzadeh M, Fischer R. Luteinizing hormone supplementation in controlled ovarian stimulation: the Iran Delphi consensus. *Front Reprod Health.* 2024 May 9;6:1397446

7-. Rahimiyan K, Nasr Esfahani MH, Karamali F. The proliferative effects of stem cells from apical papilla-conditioned medium on rat corneal endothelial cells. *Wound Repair Regen.* 2024 May-Jun;32(3):292-300

8-Darmishonnejad Z, Zadeh VH, Tavalae M, Kobarfard F, Hassani M, Gharagozloo P, Drevet JR, Nasr-Esfahani MH. Effect of Advanced Glycation end Products (AGEs) on Sperm Parameters and Function in C57Bl/6 Mice. *Reprod Sci.* 2024 Jul;31(7):2114-2122

9-Behrouznejad B, Sadat SB, Masaeli E. The orchestration of sustained drug delivery by bacterial cellulose/gelatin nanocomposites reinforced with carboxylic carbon nanotubes. *Carbohydr Polym.* 2024 Jun 1;333:121917

10-Mohammadi A, Jafarpour F, Vash NT, Hajian M, Nasr-Esfahani MH. Supplementation of sperm cryopreservation media with H<sub>2</sub>S donors enhances sperm quality, reduces oxidative stress, and improves in vitro fertilization outcomes *Sci Rep.* 2024 May 30;14(1):12400.





## 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 79-20) 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 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 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 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 review 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 with 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 graduates 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 model establishment





## 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 %15-10. 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, cystoscopy, 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 laparoscopy 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 Incontinence





## 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 Infertility 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:

- Cartilage: from Biology to Biofabrication  
Publisher: Nature Springer, Germany, 2023
- 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

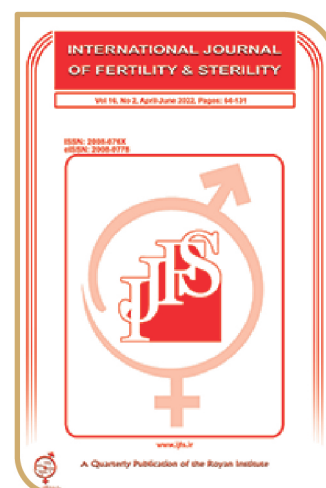
Royan Publication Department publishes two scientific journals which are published quarterly as well: Cell Journal and International Journal of Fertility and Sterility.

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.



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1

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2

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