



[www.royan.org](http://www.royan.org)

# Introduction

## ROYAN INSTITUTE

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 infertility treatment, regenerative medicine/cell therapy, the production of recombinant proteins, and the 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 the 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 also extended into stem cell studies. Afterwards, the research findings were adjusted to application in regenerative medicine and cell therapy approaches. After succeeding for 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.

## 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 an international center of excellence in research and technology, a pioneer in the development of science, technology, and innovation of biological sciences, with the authority on stem cell science, reproduction, and biotechnology. Royan is planning to be effective in the improvement of "Reproductive biomedicine" and "Regenerative Medicine" in society's health.

## Overview of the Institute

- The first IVF child born in Royan, 1993
- The first ICSI child born in Royan, 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 PGT child born in Iran, 2004
- First time use of adult stem cells in the treatment of MI during CABG in Iran, 2004
- Production of insulin producing cells from human embryonic stem cells, 2004



ROYAN  
Institute

Royan Institute Introduction

3

- 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 PGT 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
- Establishment of the Advanced Therapy Medicinal Product Technology Development Center (ATMP), 2018
- Obtaining the license of producing Kimia-cell in GMP conditions in Royan – ATMP Center from Iran FDA, 2019
- Producing the transgene Covidsa mouse for pre-clinical studies of Covid-19 vaccines, 2020
- Receiving the international ISO certificate; ISO 9001:2015 for Laboratory Animal Science Core Facility, 2020
- Publication of book entitled “Tissue Engineering Application in Ovarian Follicles Growth” by Eliva Press, 2021
- Implementing the phase I clinical trial for Natural Killer cell therapy for pediatric glioblastoma 2021
- Commercialization of human gamete and embryo freeze-thaw media, 2022
- Publication of many chapters in cell Biology and Translational Medicine (volumes 9/16/17) by Springer, 2020-2022

## Honours

- Honoring the Ever-lasting Iran Experts , 2004
- Receiving several Razi Research Awards on Medical Science hosted by the Iran Ministry of Health and Medical Education
- Being selected by Iran National Award for the Book of the Year, 2009
- Receiving The Islamic Educational, Scientific, and Cultural Organization “ISESCO”- Science and Technology Prize, 2010

- Winning the UNESCO Prize, 2014
- Earning The World Academy of Science "TWAS" Prize, 2019
- Gaining the 32nd Khawrizmi Award, 2019
- Receiving the Mustafa Prize, 2019
- Placing 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), 2020
- Selection of a chapter book entitled "3D Printing in Dentistry" in Applications of Biomedical Engineering in Dentistry (by Springer) as one of the 2020 highlighted research
- Receiving the Health Service Medal from Tehran Municipality, Health Section, 2021
- Achieving second place among 52 Iranian research Institutes, 2022
- Winning Dayong Gao Young Investigator Award Cryobiology Society,( 2022)
- Granting the privilege of the Iran National Elite Foundation (INEF) to Royan Publication, 2022
- Placing as 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, 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.

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

## Royan Ethics Committee

The Ethical Committee of Royan was established in 2003 with 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 solving the ethical and law issues

### Main Activities

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

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



**Research**

# 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 by 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 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 treatment. The vision of this institute is to achieve the accurate diagnosis and treatment of infertility based on modern reproductive knowledge, which will lead to healthy newborns in a short period of time. This Institute's mission is to research 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

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

## Endocrinology and Female Infertility Department

This department was established in 1994 to study new strategies for diagnosing and treating female infertility and recurrent abortion to increase embryo implantation rates.

### Goals

- Improving *in vitro* fertilization (IVF) outcomes
- Providing appropriate clinical guidelines for the 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

## Ethics and Medical Law Department

Department of Ethics and Medical Law was established in 2019. Previously the activities of this department were set up in the Ethics group, but recently they are extended to the following subjects of researches: ethical issues in Assisted Reproductive Techniques (ARTs), 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 proposing new laws and legislations in a new era of ART, Stem Cell, and Biotechnology
- Solving current ethical dilemmas in reproductive medicine and cell therapy
- Investigating the religious (especially Islamic) issues in the 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 counselling and solving ethical cases in ART, Stem Cell, and Biotechnology fields
- Designing a consent form
- Conducting ethical committee
- Performing ethical and legal researches in the interested fields of Royan Institute

## **Male Infertility** Department

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 dis-function and ejaculation disorders
- Studying the etiology of abnormal semen parameters

## **Reproductive Genetic** Department

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 recurrent spontaneous abortion (RSA) in the Iranian population



ROYAN  
Institute

Royan Applied Research Centers

### **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

## **Reproductive Imaging Department**

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

### **Goals**

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

### **Main Activities**

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

# Research

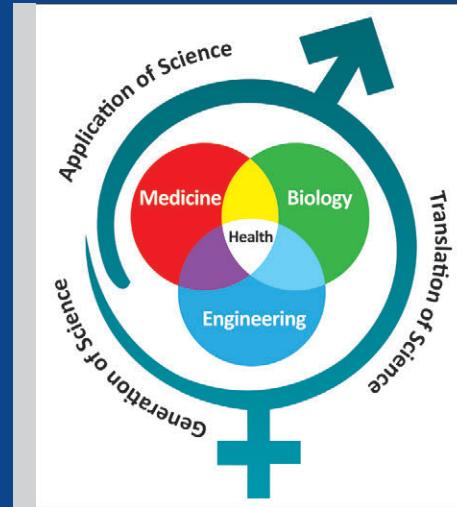
## ROYAN INSTITUTE FOR STEM CELL BIOLOGY AND TECHNOLOGY

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



ROYAN  
Institute

Royan Applied Research Centers

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 the 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.

Besides research for understanding the fundamentals of stem cell 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 the 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

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

### 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

## Department of Cell Engineering

This department was established in 2016 with the aim to provide a multidisciplinary environment for the 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

## Department of Regenerative Medicine

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 activity 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.



# Research

## 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 endeavours 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 a premier precision tool for future health development. RI-DB includes the 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 the high genetic potential
- Applying ART in farm animals
- Improving sperm selection methods for ART
- “Bench to production” approach in animal farming



ROYAN  
Institute

Royan Applied Research Centers

### 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



# Research

## RESEARCH CENTER FOR BASIC AND POPULATION BASED STUDIES IN NON-COMMUNICABLE DISEASES

According to the latest report from the International Diabetes Federation, there are currently 463 million people with diabetes worldwide, half of whom are undiagnosed. It is also estimated that in the next 15 years, the global prevalence will increase to 700 million people. Iran is considered the third country in the region with an adult population (age 20-79) of more than 5 million people with diabetes.

In 1980 the global obesity prevalence was reported 29% which rose to 37% in 2013. In Iran, over 25 million people are overweight (63% of the adult population). Moreover, 30% of the country's children population are considered overweight. Currently there are one million obese people in the country and it is anticipated that there will be a rapid escalation of obesity in Iran over the next few years.

Taken together, these health concerns make a great challenge and considerable economic burden on the country's healthcare system and the growing rate necessitates a systematic approach in all aspects of research, prevention and therapy.

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

- Cell-based therapy research: development of stem cells and pancreatic islet transplantation technologies
- Biodiscovery and disease modelling: cell-based disease modelling, generation of transgenic animal models for diseases, natural compound discovery by high-throughput screenings to test on cell and animal models of disease



ROYAN  
Institute

Royan Applied Research Centers

- Clinical and epidemiological studies: designing epidemiological studies on the prevalence of obesity, diabetes and other endocrine diseases among juveniles and adults to find disease prevention methods; designing and running clinical trials for novel treatments in endocrine and metabolic diseases; conducting systematic reviews on subjects lacking scientific consensus



# Research

## 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, it is trying 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  
Institute

Royan Applied Research Centers



## 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, and 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 education of scholars performing ground researches on experimental animals, by organizing proficient gadgets in all categories within the animal research fields. Each center has three major activities:

- Maintenance and breeding the animals
- Creating animal models with surgical manipulations or chemical interactions
- Research and develop animal modelling

Scientists of this service unit facility who are responsible for the design of animal experiments have to be graduated in Veterinary Medicine or one of the biomedical science fields and must have taken a course on laboratory animal science which concentrates on the humane and gentle handling of animals. They also should be aware of the 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 the 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 educational programs to enable them to achieve scientific eminences in selected areas
- Producing, supporting and maintaining laboratory animals required for research
- Managing the animal care and committing to them
- Managing a preventive medicine program for disease control
- Advising research departments on all aspects of experimental use of animals, including experimental design, surgical, pre and post-operative care, oocyte and embryo harvesting, and experimental animal modeling establishment



# Research Other Activities

## 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 the commercialization of research findings to offer services and biological products for the purpose of resolving the country's specialized needs. RITAC investigates on the feasibility of studies, writes business plans, and conducts Research and Technology Laboratory (RTL) researches to a higher financing and investment level. It also makes the correlation between innovators, idea owners 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 one start up and five companies are mentioned:



### Center for **Translational Bio-Discovery**

The Center for Translational Bio-Discovery (CenTraBio) has been established in 2018 and is located in Royan Institute Technology Incubator Center. CenTraBio is an international, independent, non-profit R&D organization dedicated to the discovery and development of bioactive natural products with commercial potential as pharmaceuticals or functional ingredients (for use in dietary supplements, food, or animal feed). CenTraBio will collaborate closely with different universities, research institutes, and companies in Iran and worldwide, and will have legal entities in the EU soon.



## 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 thousands of samples have been already stored in a private bank whose owners have given their voluntary informed consent to donate them to 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; which 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.



ROYAN  
Institute

Royan Other Activities

## Royan AtiTech Pharmed

Royan AtiTech Pharmed company is one of the manufacturing groups in the field of regenerative medicine in Iran, which is equipped with a comprehensive quality control laboratory for advanced cell products, standard clean rooms with grade A and B, and the latest advanced technological devices for isolation of human pancreatic islets. This company holds the Good Manufacturing Practice (GMP) certificate, as well as the quality management and quality assurance of advanced cellular products systems. It produces Dook Cell and Ruin Cell products. Royan AtiTech Pharmed is identified as the only active center in the field of isolation of human pancreatic islets in Iran.

## Dam Espadana Company

Royan Dam Espadana company works in the field of increasing genetic potential in dairy livestock, especially goats. Currently, it produces breeds of dairy goats such as Saanen, Alpine, and Murcia commercially. In this regard, Royan Dam Espadana provides and preserves sperm for laparoscopic artificial insemination in different breeds of livestock, and now it teaches how to take sperm from about nine different breeds of goats and sheep.

In order to increase the genetic potential of animals for economic purposes this company carries out crossbreeding through embryo production and transfer of in different breeds of livestock.



# Research Other Activities

## ROYAN INTERNATIONAL RESEARCH AWARD



### Royan International Research Award

Royan International Research Award 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. The research papers are put in a scrutinizing jury system which relies on the international scientific board of Royan International Research Award, with special thanks to its honorable members. The winners are invited to take part in the Award Ceremony to be granted their awards. Each winner is rewarded with a certificate, the Royan Award trophy, and a prestigious gift.

### Kazemi Prize

The Prize is an international Prize that was established in 2010 to respect the efforts and revive the memories of Dr Saeid Kazemi Ashtiani; the late founder of Royan Institute. Kazemi Prize is awarded to a scientist or scientists who have made an outstanding contribution to biological sciences and health promotion. It shall consist of a medal, a diploma, and a cash award. The Prize is biennially beside Royan International Twin Congress in Islamic Republic of Iran.



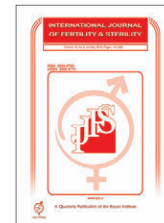
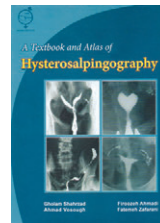
ROYAN  
Institute

Royan Other Activities

# ROYAN INSTITUTE PUBLICATION

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

- Tissue Engineering Application in Ovarian Follicles Growth  
Publisher: Eliva Press, Republic of Moldova, 2020
- Marital Satisfaction and Quality of Life in Polycystic Ovary Syndrome Patients  
Publisher: LAP LAMBERT, Germany, 2019
- 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 by 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 the 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 that 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 the 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.

Treatment

# Treatment

## Infertility Clinic

The rate of infertility among Iranian couples is estimated to be 10-15%. Royan Infertility Clinic is the second clinic that was established in Iran and the first one in Tehran in 1991. After three decades of experience, Royan Infertility Clinic gave birth to more than 40,000 thousand live babies. Most of the patients are referred by other physicians and clinics. Due to its high success rate of infertility treatment, this center has become a referral center for infertility treatment for Iranian and non-Iranian patients. Each year about 200,000 clinic visits and more than 6000 treatment cycles including numerous foreign patients are performed in Royan Infertility Clinic.

Royan Infertility Clinic includes different clinical, paraclinical, and diagnostic services:

- Female Infertility; Diagnosis and Treatment: Laparoscopy, Hysteroscopy, Diagnostic Curettage, Cervical Cerclage,
- Male Infertility; Diagnosis and Treatment: PESA, TESE, MD –TESE, Vasovasostomy, Varicocelectomy, VEA, TURED Infertility - Diagnosis and Treatment
- Assisted Reproductive Technology (ART): IUI, IVF, ICSI, IVM, Assisted Hatching
- Endometriosis





- Genetic Testing: PGD, PGS, Molecular Genetic Tests, Family Balancing
- Reproductive Imaging modalities such as rectal and vaginal ultrasonography
- Counseling for: Endometriosis, Recurrent Abortion and RIF, Premature Ovarian Failure, Perinatology, Fertility Preservation (Egg, Sperm, Embryo, Testis and Ovary Tissue Freezing), Third-Party Reproduction, Blood and Hematology, Endocrinology and Metabolism, Genetic, Immunology, Nutrition and Diet Therapy, Psychiatric, Family and Social Fertility

## 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



## Diabetes Clinic

Based on a decade of experience in basic and translational diabetes research, the Diabetes Clinic of Royan Institute was established in 2019 to pursue its goals by implementing an interdisciplinary approach and building effective collaborations.

Royan Diabetes Clinic specializes in Diabetes & Metabolic disease. Researchers, clinicians, and educators of Royan diabetes clinic focus on improving the quality of patients' lives with diabetes in a multidisciplinary environment. The services are provided by a team of consultants, trained medical staff, and specialists, who are well-versed in the diagnosis of diabetes, its management, and its short- and long-term complications. Royan Diabetes Clinic team consists of diabetes physicians, adult and pediatric endocrinologists, registered dietitians, exercise physiologists, cardiologists, optometrists, ophthalmologists, psychiatrists, podiatric, urologists, obstetric and gynaecologists, and nurses.



ROYAN  
Institute

Royan Treatment Clinics

**E**ducation



# Education

## ROYAN DEPARTMENT OF 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 teaching/learning opportunities in terms of long and short-term specialized educational and training courses and national and international events, as well.

The academic or degree-based educational activities are as follows:

- Master of Science: Developmental Biology, Cellular and Molecular Biology, Stem Cell Biology, Genetics, and Biochemistry, as well as PhD in Developmental Biology in collaboration with the University of Science and Culture
- 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
- Female Infertility and Andrology Fellowships

The short-term courses in Royan International Specialized Training Center including specialized courses, workshops, seminars, symposiums, and congresses for national and international audiences are held by different departments of Royan Institute as follows:

- Reproductive Biomedicine (Embryology, Female and Male Infertility, Reproductive Genetics, Reproductive Imaging, Nursing & Midwifery)
- Stem Cell Biology and Technology
- Biotechnology

National and international educational events and activities include:

Royan International Twin Congress, the Congress of West Asia & North Africa scientific society, Royan International Summer School on Stem Cell Biology & Technology, and annual international symposiums on: Cancer, Bioinformatic, Female and Male Infertility, Cryobiology and some other events such as ROYAN GEN, edu-tourism.



ROYAN  
Institute

Royan Educational Activities

## 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 along with an annual Seminar on Nursing and Midwifery every September. 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.



## West Asia and North Africa Congress

The first-round congress of West Asia and North Africa (WANA) was held as a subdirectory of Royan Twin Congress in the realm of considering the recent approaches and main challenges in Reproduction and Infertility Treatments in Mashhad, Iran in June 2022.

The purpose of the WANA Scientific Society (WSS) is to provide a powerful scientific atmosphere for setting up mutual educational events and sharing basic studies and applied and clinical researches and trials in the WANA region as a "vigorous science pole" around the world in the fields of reproduction and infertility treatment, stem cells biology and technology and biotechnology.



## Royan Global Education Network

According to the mission and vision of Royan Institute focusing on “Education with no border”, Royan Global Education Network (Royan GENE) has been established in deputy of education of Royan Institute. This international event provides a beneficial opportunity for students and researchers to communicate with a wide range of prominent professors and scientists who give lectures in different scientific sections of this event. Among them, Prof Randy Wayne Schekman, winner of the Nobel Prize in 2013, can be mentioned.

## Royan Edu-Tourism

The Edu-Tourism Program is one of the integrated programs of education and tourism that is lately launched by the Royan Institute. These courses are held in two national and international levels. Courses are specifically designed for students interested in research and laboratory activities in the following fields: Biotechnology, Stem Cells (Adult and Embryonic), Tissue Engineering, Regenerative Medicine, Cell Therapy, Reproductive Sciences (Female Infertility, Andrology, Embryology, Genetics, Imaging, & Midwifery).



## International Trainees in Royan Institute

Based on its scientific mission, Royan Institute has always conveyed its scientific knowledge and experiences. In the sense that, international students and scholars from different countries have attended to Royan Research Institute for training. Syria, Iraq, Malaysia, Afghanistan, Venezuela and etc., are to name but a few. They have attended our short-term courses (from 3 days) to Long-term courses (one year and more).

## Royan International Training Courses in the Foreign Countries

As per the international educational programs of Royan Institute, the International Education Department has conducted training courses outside the borders by professional scholars and faculty members. Regarding international training, Royan Institute instructors has already educated in some foreign countries like Malaysia, Syria, Pakistan, and Afghanistan on topics related to Reproduction, Stem Cells, and Biotechnology for a few days in hands-on workshops or training courses.



ROYAN  
Institute

Royan Educational Activities

# Education

## FACULTY OF BASIC SCIENCES AND MEDICAL TECHNOLOGY

By establishment authorization issued by the Ministry of Medical Education, The Faculty of Basic Science and Medical 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 by this faculty are as follows:

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

### Mission

- Cooperation in the development and elevation of health conditions in the country
- Elevation of scientific position international levels by providing and paving the appropriate way for scientific fabric and necessary infrastructure for research activities to expand of 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 the commercialization of research achievements to meet the country's scientific requirements
- Expansion of international relationships in research and advanced medical technologies
- Promotion of existing capabilities to access to frontiers of knowledge