

Fahimeh Piryaei, PhD

Assistant Professor of Medical Genetics

Address: Department of Molecular Medicine and Human Genetics, School of Medical Sciences,

Hamadan University of Medical Sciences, Hamadan, Iran

Email: f.piryaei@gmail.com, f.piryaei@umsha.ac.ir

Webpages: [ResearchGate](#)

[LinkedIn](#)

Research Interest

My focus is mainly on understanding the pathogenesis of idiopathic infertility. For this goal, I investigate transcriptome of the idiopathic infertile individuals via different molecular techniques including genetic and epigenetic high-throughput methods. My second research interest is identifying the etiology of monogenic (Mendelian) disorders. This purpose is reachable through utilizing Next Generation Sequencing (NGS) techniques since I am expert in Whole Exome Sequencing (WES) analysis.

Educational Background

Doctor of Philosophy, Medical Genetics (2013- 2019)

Tarbiat Modares University, Iran

Thesis Title: Comparison of miRNAs expression profile in testis tissue samples of obstructive and non-obstructive azoospermia men by RNA sequencing

Thesis Details: The etiology of male infertility accompanied by azoospermia is largely unknown especially at the molecular level. Identifying the global expression profile of dysregulated microRNAs in male infertility would be useful to achieve a more profound understanding of pathogenesis. Small RNA sequencing was performed on testicular tissues of nonobstructive azoospermic patients with Sertoli cell only syndrome (SCOS) and those of obstructive azoospermic individuals. A total of 149 miRNAs were detected to be differentially expressed in the Sertoli cell only syndrome group in comparison with the obstructive azoospermia group. Of these, 19 microRNAs were novel. Bioinformatics analysis suggested that the altered miRNAs were substantially involved in pathways related to spermatogenesis. This study sheds light on the crucial role of microRNAs in idiopathic Sertoli cell only syndrome, suggesting potential targets for employing molecular therapeutic strategies in spermatogenic failure treatment.

Achievements: Since we have identified some novel miRNAs for the first time, we have experimentally been confirming them in collaboration with international scientists. Some new proposals are being performed to prove our findings. Therefore, the main papers are under review or submission.

Supervisor: [Prof. Hossein Mozdarani](#)

GPA: 18.16 / 20

Master of Science, Cellular and Molecular Biology (2009-2011)

National Institute of Genetic, Engineering and Biotechnology (NIGEB), Iran

Project Title: Investigation on mitochondrial ATPase 8/6 and tRNA^{Lys} genes and D-Loop region in Iranian patients suspected to autism

Supervisor: [Dr. Zahra-Soheila Soheili](#)

GPA: 18.85 / 20

Bachelor, Biotechnology (2005-2009)

Shahed University, Iran

GPA: 15.74 / 20

Academic Experience

- Assistant professor, Hamadan University of Medical Sciences (UMSHA), Hamadan, Iran (2019-present)
- Genetic counselor, Omid Health clinic, Hamadan (March 2021-present)
- DeNA (Niloufar) Laboratory, Tehran, Iran (2017- 2018)
- Fellowship offer, Department of Obstetrics and Gynecology/Department of Surgery, Baylor College of Medicine, Texas, USA-2018

Research Projects

Project Title	Novelty	Source		
			Rials	Year
Characterization of novel small RNAs detected in human sperm using bioinformatics methods and laboratory confirmation	More than 60 miRNAs are being introduced for the first time.	Hamadan University of Medical Sciences	298,240,000	2022 Ongoing
Identification of causative variant(s) of rigid spine syndrome in an Iranian family by whole-exome sequencing	This investigation would help in identifying new causative mutations.	Hamadan University of Medical Sciences	0	2022 Ongoing
Identification of causative variants of Neu-Laxova syndrome (NLS) in an Iranian family by whole-exome sequencing	NLS is a very rare disease with less than 100 cases in the world. This investigation would help in identifying new causative mutations.	Hamadan University of Medical Sciences	0	2022 Ongoing
The necessity of revising and redeveloping of the medical biotechnology curriculum in the master's degree based on the Iran country's employment market requirements and state-of-the-art technology in the world	1. Establishing mutual communication between the university and employers/industries 2. Increasing the employment of Medical Biotechnology graduates	Hamadan University of Medical Sciences	30,000,000	2022 Ongoing

Investigation of presence of three novel microRNAs found in testicular tissue in seminal plasma of fertile men	These miRNAs are being investigated for the first time.	Hamadan University of Medical Sciences	147,000,000	2021 Ongoing
Isolation, culture and differentiation of chicken bone marrow mesenchymal stem cells	We were the first group in the world who performed such a project.	Islamic Azad University, Ashtian Branch	20,000,000	2009-2010

International Collaboration

Male infertility and COVID-19 as an Online Research, American Center for Reproductive Medicine (ACRM), Cleveland Clinic, Cleveland, USA (2020-2021),

Meta-analysis on Polycystic Ovarian Syndrome Pathogenesis in collaboration with Department of Obstetrics and Gynecology/Department of Surgery, Baylor College of Medicine, USA, (2018-now)

Research Publications

Books

1. Harper's Practical Genetic Counselling. By Angus Clarke et al. 2020. Translation into Persian (with Dr. Emran Esmailzadeh, Sajjad Biglari). 2020. Arak University of Medical Sciences Press. Iran.
2. Human Genetics: from Molecules to Medicine. By Christian P. Schaff et al. 2011. Translation into Persian (with Dr. Abdolazim Sarli and Dr. Amir Mashayekhi, supervised and edited by Prof. Hossein Mozdarani). 2017. Baresh-e-Danesh Press. Iran.
3. Genetics 3in1. 2013. Compilation in Persian. Nahr Press. Iran.

Journal Papers

1. Leila Emrahi, Sahra Sahraeean, Asiyeh Jebelli, Zahra Shahbazi, **Fahimeh Piryaei**. Robertsonian translocation (14q;15q) Homozygosity in a newborn with a familial history of recurrent abortion and affected newborns with the symptoms of hepatosplenomegaly: Case report & literature review. Journal of Reproduction and Infertility (JRI) 2023 (under review)
2. **Piryaei F**, Mozdarani H, Gilani MAS, Singh R, Finelli R, Darestanifarahani M, Sarli A, Agarwal A. Global analysis in non-obstructive azoospermic testis identifies miRNAs critical to spermatogenesis. Andrologia 2023 DOI:10.1155/2023/2074931
3. **Piryaei F**, Pakmanesh R, Salehirad M, Akbari S, Edizadeh M, Khodadadi H. A novel variant in ALDH1A3 causes congenital microphthalmia-8 in an Iranian consanguineous family. European Journal of Medical Genetics (ejmg) 2023 doi.org/10.1016/j.ejmg.2023.104801

4. Ebrahim Shirzaheh, **Fahimeh Piryaeei**, Hanieh Naddaf, Zahra Barabadi. Two new variants in FYCO1 are Responsible for Autosomal Recessive Congenital Cataract in Iranian Population. Cell journal (Yakhteh) 2022, 24(6) doi:10.22074/cellj.2022.8116
5. Rasouli Ghahfarokhi SM, Dasmeh A, farahmandi AY, khedri A, Asadi, **Piryaeei F**, Moradi L. The study of COVID-19 in an Iranian with sickle cell disease. IJBC 2021; 13(2): 54-57
6. **Piryaeei F**, Mozdarani H, Sadighi Gilani MA, EbrahimiM. Homo sapiens (Human) microRNA187Expression Is Dysregulated in Testis of Non-obstructive Azoospermic Men. Int J Basic Sci Med.2020;5(2):39-42. doi:10.34172/ijbms.2020.08.
7. **Fahimeh Piryaeei**, Massoud Houshmand, Omid Aryani, Sepideh Dadgar, Zahra-Soheila Soheili. Association of the Mitochondrial ATPase 6/8 and tRNA^{Lys} Genes Mutations with Autism in Iranian Patients. Yakhteh 2012; 14(2):98-101.
8. Piryaeei F, Ramezani M, **Piryaeei F**. The effect of age and strain on screening, proliferation, and differentiation of chicken bone marrow mesenchymal stem cells. Arak Medical University Journal (AMUJ) 2011; 14(55): 18-28.

Abstracts and Conference Presentations

1. ESHG (European Society of Human Genetics), Glasgow, United Kingdom, 2023. Inter-chromosomal effects of Robertsonian translocation of chromosomes 13 and 14 resulted in a newborn with trisomy 21. (E-poster)
2. ESHG (European Society of Human Genetics), Glasgow, United Kingdom, 2023. A novel frameshift variant in the SEPN1 gene causes rigid spine syndrome in an Iranian consanguineous family. (E-poster)
3. Royan International Twin Congress, Tehran, Iran, 2021. The evaluation of Poly-T, TG-repeats and M470V polymorphism of the CFTR gene in Iranian males with non -Obstructive Azoospermia. (Oral presentation)
4. ESHG, Vienna, Austria, 2020, Hsa-miR-449a-5p is a promising potential non-invasive indicator to discriminate between non-obstructive and obstructive azoospermia. (Poster presentation)
5. Royan International Twin Congress, Iran, 2018, Effect of RNAlater on RNA Integrity in the snap freezing of testis tissues. (Poster presentation)
6. ESHG, Nürnberg, Germany, 2012, Investigation of mitochondrial tRNAThr and tRNAPro genes mutations in autism. (Poster presentation)
7. ESHG, Nürnberg, Germany, 2012, The effect of age and strain on screening, proliferation, and differentiation of chicken bone marrow mesenchymal stem cells (Poster presentation)
8. ASHG (American Society of Human Genetics), San Francisco, 2012, Investigation of mitochondrial D-Loop variations in autism (Poster presentation)
9. ASHG, San Francisco, 2012, Comparison of the differentiation potential of human mesenchymal stem cells and several animal species (Poster presentation)

Contribution to Research

Journal Reviewer

Scientific Reports-Nature (IF: 4.379) 2021

Biopreservation and Biobanking (IF: 2.3) 2021

Journal of Fertilization: In Vitro (ISC) 2021

Gene Reports (IF: 0.72) 2021

Proposal Reviewer

1. Design of a recombinant multi-epitope vaccine against oral squamous cell carcinoma using immunoinformatics approaches and evaluating the stability of the vaccine using molecular dynamics simulation- Academic member's proposal (2022)
2. Identification of genetic polymorphisms related to Hirschsprung disease susceptibility- Academic member's proposal (2022)
3. Determine the effect of resveratrol and vitamin D on Foxo1, Sirt1, Bax, Bcl2, and Pten expression in silicosis rat model (2022)
4. Evaluation of the effect of circ-PVT1 inhibition on 5-fluorouracil drug sensitivity in colorectal cancer cells, HCT116- Academic member's proposal (2022)
5. Evaluation of expression level of tumor suppressor gene Phosphatase and tensin homolog (PTEN) in patients with chronic hepatitis C compared with control group- Academic member's proposal (2022)
6. Evaluating the inhibitory impact of effective compounds in *Scutellaria baicalensis* Georgi on targets potentially involved in poor prognosis in patients with oral squamous cell carcinoma- Academic member's proposal (2022)
7. Rational design of peptide against VEGFR3 and VEGFR2 receptors in HCT116 colorectal and HUVEC cell lines – MSc thesis (2022)
8. Green synthesis of Gold Nanoparticles Using Ethanol Extract of *Rosa damascena* and Investigation of Its Antibacterial Effects against Methicillin Resistant *Staphylococcus* – MSc Thesis (2021)
9. Design and implementation of a concept map training workshop and evaluation of its outcomes on the level of knowledge, attitude and behavior of students in learning the unit of respiratory physiology- Academic member's proposal (2021)
10. Production of structure similar to AlloDerm- Academic member's proposal (2020)
11. Synthesis and evaluation of an injectable conductive hydrogel for 3D Printing and support of electroactive tissue regeneration- Academic member's proposal (2020)
12. One extra chromosome and right to life- Book (2021)

Committee Member

Executive committee member of “7th National and 1st International Seminar on Medical Genetics”, Kurdistan university of Medical Sciences, Iran, 2021

Responsibility

Manager of Genetics Engineering Laboratory, Hamadan University of Medical Sciences 2022-present

Awards and Honors

Rank 3 in PhD Entrance Exam, 2013

2nd-ranked GPA in PhD, 2019

3rd-ranked GPA in MSc, 2011

Workshop Attendance

- Online ART Training course (Modules 1-5), 2020-2021, American Center for Reproductive Medicine, Cleveland, the USA
- Quality Basics, Principles of Establishing a Quality Management System and Internal Assessment (Audit) in Diagnostic, Pathology, IVF (Infertility) and Medical Genetics Laboratories, 2018, Sarem Hospital, Tehran, Iran

- Epigenetic Data Analysis (ChIP-seq & Genome-wide Methylation), 2017, National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran
- Computational systems biology: Network analysis, Gene ontology and Promoter analysis, 2017, National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran
- Meta-analysis of high-throughput sequencing data, 2017, National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran
- Health, Safety and Environment (HSE) in laboratory, 2014, Tarbiat Modares University, Tehran, Iran

Memberships

American College of Medical Genetics and Genomics (ACMG), America 2022-present

Research on Education Committee member, Center for Medical Education Research and Development (EDC), Hamadan University of Medical Sciences 2020-present

Medical council of Iran 2020-present

Iranian society of medical genetics (ISMG) 2013-present

Invited speaker

1. Thalassemia, **International Educational-Research Webinar on Thalassemia**, Hamadan university of Medical Sciences, Iran in collaboration with University of Nantes, France 2021
2. Stem Cells and Their Applications, Department of Biology, Ministry of Education, Iran 2013
3. Genetics Disorders, Department of Biology, Ministry of Education, Iran 2011

Laboratory skills

RNA extraction, DNA extraction, PCR, Real-Time PCR, Western blotting,

Sequencing, next generation sequencing (NGS), RNA sequencing analysis, Epigenetic data analysis, Meta-analysis of high-throughput sequencing data, Computational systems biology, Flow cytometry,

QF-PCR, MLPA, Cell culture, Cytogenetics (Karyotype, FISH, CMA3, TUNEL)

Bioinformatics skills

Softwares, Websites and Database including Codoncode, Finch TV, CLUSTAL-X, Gene Runner, CLC Genomics, SCIENCE DIRECT, NCBI, UCSC, OMIM, DDBJ, EBI, Mutation Taster, Proven, PolyPhen-2, Phyre2, Genomatix, Pathway Studio, Cytoscape

Students' Thesis Guidance

Advisor: The effects of Citrus limon's fruit-derived extracellular vesicles on viability, migration and EMT related gene expression in the human colorectal adenocarcinoma (SW480) cell line, 2022

Supervisor: Investigation of expression of two novel microRNAs found in human testicular tissue in seminal plasma of fertile men. University of Maragheh, 2021

Teaching experience

- Medical genetics, Ph.D. students of Molecular Medicine
- Medical genetics, M.Sc. students of Medical Biotechnology
- Neurogenetics, Ph.D. students of Neurosciences
- New methods in molecular diagnosis of diseases, Ph.D. students of Medical Biochemistry
- Genetic disorders and counseling, M.Sc. students of Children's Nursery
- Principles of genetic counseling and inherited disorders, M.Sc. students of Midwifery
- Genetics, MBBS students (international)
- Genetics, Medical students
- Human genetics, international students of Dentistry
- Genetics and immunology, B.Sc. students of Nursery

References

Prof. Hossein Mozdarani,

Department of Medical Genetics, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran;

Head, Cytogenome Laboratory, Tehran, Iran

Email: Mozdarah@modares.ac.ir mozdaranih@gmail.com

Prof. Mohammad Ali Sadighi Gilani, MD

Department of Urology, Faculty of Medical Sciences, Tehran University of Medical Sciences, Tehran, Iran

Department of Andrology, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran.

Email: masadighi@gmail.com

Dr. Rajender Singh

Associate professor, Endocrinology

CSIR-Central Drug Research Institute, BS-10/1, Sector 10, Jankipuram extension, Sitapur Road, Lucknow 226031, India

Email: nainrs@gmail.com