

SAIRA AMIR, PhD
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Personal Information:

Date of Birth: 01-01-1985

Gender: Female

Nationality: Pakistani

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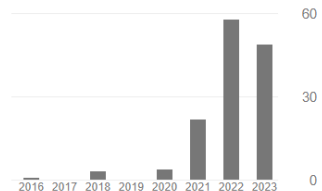
Loop: <https://loop.frontiersin.org/people/2386685/overview>

LinkedIn: <https://www.linkedin.com/in/dr-saira-amir-phd-71789b33/>

Google Scholar profile: https://scholar.google.com.pk/citations?user=588_hxwAAAAJ&hl=en
(updated 17-08-2023)

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	All	Since 2018
Citations	140	137
h-index	5	5
i10-index	3	3



Research Statement:

My research in bioinformatics integrates computational and data analysis techniques with biological research to advance genomic medicine. I focus on functional genomics, genomic variation analysis, disease biomarker discovery, integrative multi-omics analysis, and clinical genomics. This multidisciplinary approach combines computational biology, statistics, machine learning, and molecular biology techniques. The expected impact includes advancing biomedical research, improving clinical practice through precision medicine, and contributing to publicly accessible data resources. My goal is to drive discoveries with scientific and clinical relevance, ultimately enhancing healthcare and our understanding of the human genome.

Present Appointment: Lecturer, COMSATS University Islamabad, Pakistan

Employment History:

1. Lecturer: COMSATS University, Islamabad (2015- till date)

Job Responsibilities:

- i. Teaching Undergraduate students.
- ii. Supervising Undergraduate and graduate students in research projects.
- iii. Making exam papers and evaluations, reviewing assignments and quizzes.
- iv. Research paper writing.
- v. Administrative tasks such as helping in the admission process and conducting exams.
- vi. **Courses Taught: Developmental Biology, Linux for Biological Sciences, Introduction to Bioinformatics, Environmental Biology, Cell Biology**

2. Research Associate: COMSATS University Islamabad 2011 to 2015

Job Responsibilities:

- i. Teaching Undergraduate students.
- ii. Supervising Undergraduate students in research projects.

- iii. Making exam papers and evaluations, reviewing assignments and quizzes.
- iv. Research paper writing
- v. Courses Taught: Developmental Biology, Cell Biology, Biotechnology
- vi. Working in labs (Mammalian Tissue culture lab, Virology Lab, Cancer Genetics Lab, Epigenetics Lab)
- vii. Maintaining Accounts of the funded projects, and processing Bills for vendors or reimbursements.
- viii. Purchasing instruments/ opening tenders and consumable supplies for the lab

Projects:

1. Identification of MMTV-like sequences from Breast Cancer Patients.
2. Establishment of a State-of-the-art Tissue Culture Facility at COMSATS University Islamabad.

**3. Visiting lecturer International Islamic University Islamabad Spring 2008 and Spring 2010
Job Responsibilities:**

- i. Teaching Undergraduate students.
Making exam papers and evaluations, reviewing assignments and quizzes.
- ii. Research paper writing
- iii. Courses Taught: Theory of Automata

Visiting Research Fellow Positions:

1. **Environmental Health Lab, Department of Public Health University of Massachusetts, Amherst USA.** (September 2018 - April 2019)

Supervisor: Dr. Alexander Suvorov.

Project: mTOR Complex1 and mTORC 2 as regulators of Blood testis barrier and sperm aging via epigenetic regulation of sperm DNA.

2. **Laboratory of Toxicology Department of Medicine, University of Crete, Heraklion Greece.** (September 2016 - July 2017)

Supervisor: Prof. Dr. Aristides M. Tsatsakis

Project: Exposure of DDTs and PCBs in hair urine and Blood samples of infertile men and women

Academic Qualifications:

1. 2015-2022:**Ph.D. (Biosciences)** COMSATS University, Islamabad. **(Among Top 5% of Students)**
2. 2008-2010 **MS (Biosciences)** COMSATS Institute of Information Technology, Islamabad.
3. 2003-2008 **BS (Bioinformatics)** International Islamic University, Islamabad.
4. 2001-2003 **Fsc (Premedical)** Federal board of intermediate and secondary education, Islamabad. **(Among Top 5% of Students)**

5. 1999-2000 **Matriculation (Science)** Federal board of intermediate and secondary education, Islamabad. (3rd Position in Whole School)

Awards, Esteem, Engagement & Impact Indicators:

1. Visiting Research Scholar at the University of Massachusetts, Amherst Funded by Higher Education Commission Pakistan.
2. ERASMUS MUNDUS LEADER scholarship for the period of 10 months for Ph.D. research work to be conducted in the Laboratory of Toxicology Department of Medicine, University of Crete, Greece.
3. Merit-based MS Scholarship covering tuition fee and monthly stipend for the period of 18 months offered by COMSATS Institute of Information Technology, Islamabad.
4. BS scholarship covering 90% of tuition fee for the period of 4 years offered by International Islamic University Islamabad.

MS Thesis:

Preliminary Studies Characterizing the prevalence of Human Mammary Tumor Virus (HMTV) In Human Breast carcinomas of Pakistani patients.

PhD Thesis:

Study of Risk factors associated with infertility in Pakistani Population.

International training:

1. International Summer Academy on Spatial Ecotoxicology and Ecotoxicological Risk Assessment- Using an Open Community Approach (**University of Koblenz- Landau, Germany**) 5 ECTS
2. International Summer Camp (**Turkish red crescent Burse/Mudanya, Turkey**)
3. Continuing education course: Making the Most of Your Data: How to Build Machine-Learning Models for Toxicology (**SOT 2023 Nashville Tennessee, USA**).

Skills:

Field Work/ Sampling: I first sampled Breast cancer tissue samples from different hospitals in Islamabad and Rawalpindi for which I actively participated in establishing collaborations and getting ethical approvals for the collection of fresh tissue samples soon after surgery. I was able to collect 50 samples of tumor and control tissue along with the blood of the same patients. The questionnaire was also filled out as an interview after the recovery of the patients.

For my PhD, most of the sampling both for EDCs and microbiome projects was carried out from different areas of Pakistan. That was most challenging especially when a female is working on male infertility in a conservative society like Pakistan. Despite facing threats and a lot of criticism I was able to collect around 200 samples for my research.

Molecular Biology Techniques: DNA/ RNA Isolation from Blood, Tissue, and semen, PCR, qPCR, RT-PCR, nested PCR, Library Preparation for NGS, RRBS and, RNAseq, cell culture

Analytical Skills: Sample Preparation, SPME-GCMS

Animal Model Handling: Mice

High performance Computing Server: Massachusetts Green High-Performance Computing Center (MGHPCC)

Programming Languages: Python, R, C, C++, Bash scripting

Statistics Tools: R, Origin, SPSS

Bioinformatics Tools: NGS Sequence Analysis (Bismark, Bowtie, Samtools), GWAS, MSA, pairwise sequence alignment, Primer designing, mirnet, mirDB, NCBI, BLAST, dbVar, Mega, Gene Ontology, metascape, GSEA, String, DAVID, GEO datasets, TCGA and many more

Operating Systems: Linux (Ubuntu, KALI), Windows, Web servers (ssh)

Writing: Research Articles, Thesis, Research Grant

Grants / Fellowships:

1. SOT Endowment Fund/IUTOX Travel Award to attend the 2023 Society of Toxicology Annual Meeting, [March 19–23, 2023 in Nashville, TN, USA. \(\\$ 2000\)](#)
2. Graduate Student Travel Support award to attend the Society of Toxicology 62nd Annual Meeting and ToxExpo in [Nashville, TN, USA. March 19-23, 2023. \(\\$ 800\)](#)
3. Visiting Research Scholar at the University of Massachusetts, Amherst Funded by [Higher Education Commission Pakistan. \(\\$ 14,000\)](#)
4. ERASMUS MUNDUS LEADER scholarship for the period of 10 months for Ph.D. research work to be conducted in the Laboratory of Toxicology Department of Medicine, [University of Crete, Greece. \(€20,000\)](#)
5. [DAAD Fellowship to Attend Summer School in 2015 \(€ 3000\)](#)
6. [Merit-based MS Scholarship](#) covering tuition fee and monthly stipend for the period of 18 months offered by COMSATS Institute of Information Technology, Islamabad. (PKR 300,000)
7. [BS scholarship covering 90% of tuition fee](#) for the period of 4 years offered by International Islamic University Islamabad. (PKR 500,000)

International Tests/ Certifications:

1. **GRE ETS** Overall Score: 297/340
Quantitative 153/170, Verbal 144/170, Analytical 3/6
2. **IELTS** Overall Score: 7.0/9.0
Reading 8, Listening 7.5, Writing 6.0, Speaking 7.0
3. **TOEFL** Overall Score: 102/120
Reading 25, Listening 26, Writing 25, Speaking 26
4. **EL teach** Overall Score 285/300

Memberships:

2019-Current: Society of Toxicology Graduate student member.

2008-Current: Pakistan Red Crescent Society.

Invited Speaker Workshops:

Two days workshop on an insight into Biomedical sciences organized by the Department of Biological Sciences International Islamic University. (26-27 April 2021)

Journal Affiliations:

Review Editor: Frontiers in System Biology (Publisher: Frontiers)

Reviewer: Food and Chemical Toxicology (Publisher: Elsevier)

Reviewer: Toxicology Reports (Publisher: Elsevier)

Preprints:

Under Review in eLIFE

1. **Saira Amir**, Olatunbosun Arowolo, Ekaterina Mironova, Joseph McGaunn, Oladele Oluwayiose, Oleg Sergeyev, J. Richard Pilsner, Alexander Suvorov. Mechanistic target of rapamycin (mTOR) pathway in Sertoli cells regulates age-dependent changes in sperm DNA methylation. Doi: <https://doi.org/10.1101/2023.05.23.541978>

Journal Publications:

Corresponding Author Publications:

1. Syed, S.; Qasim, S.; Ejaz, M.; Malik, S.; Khan, N.; Ali, H.; Zaker, H.; Hatzidaki, E.; Mamoulakis, C.; Tsatsakis, A.M.; Shah, S.T.A.; **Amir, S.** Effects of Dichlorodiphenyltrichloroethane on Female Reproductive Tract Leading to Infertility and Cancer: Systematic Search and Review. . Toxics. 2023; 11(9):725. Doi: <https://doi.org/10.3390/toxics11090725>

First Author Publications:

1. Manzoor A, **Amir S**, Gul F, Sidique MA, Kayani MUR, Zaidi SSA, Javed S, Abbas Shah ST, Nasir A. Characterization of the Gastrointestinal and Reproductive Tract Microbiota in Fertile and Infertile Pakistani Couples. Biology (Basel). 2021 Dec 28;11(1):40. doi: [10.3390/biology11010040](https://doi.org/10.3390/biology11010040). PMID: 35053038; PMCID: PMC8773429. **(IF=5.168)**
2. **Amir S**, Tzatzarakis M, Mamoulakis C, Bello JH, Eqani SAMAS, Vakonaki E, Karavitakis M, Sultan S, Tahir F, Shah STA, Tsatsakis A. Impact of organochlorine pollutants on semen parameters of infertile men in Pakistan. Environ Res. 2021 Apr;195:110832. doi: [10.1016/j.envres.2021.110832](https://doi.org/10.1016/j.envres.2021.110832). Epub 2021 Feb 5. PMID: 33549619. **(IF=8.431)**
3. **Amir S**, Shah STA, Mamoulakis C, Docea AO, Kalantzi OI, Zachariou A, Calina D, Carvalho F, Sofikitis N, Makrigiannakis A, Tsatsakis A. Endocrine Disruptors Acting on Estrogen and Androgen Pathways Cause Reproductive Disorders through Multiple Mechanisms: A Review. Int J Environ Res Public Health. 2021 Feb 4;18(4):1464. doi: [10.3390/ijerph18041464](https://doi.org/10.3390/ijerph18041464). PMID: 33557243; PMCID: PMC7913912. **(IF=4.641)**

4. **Saira Amir**, Elena Vakonaki, Konstantina Tsiminikaki, Manolis N. Tzatzarakis, Vasiliki Michopoulou, Matthaios Flamourakis, Katerina Kalliantasi, Vasiliki Karzi, Persefoni Fragkiadaki, Elisavet A. Renieri, Dimitris Tsoukalas, Maria Thanasoula, Evangelia Sarandi, George Sakellaris, Antonios Makrigiannakis, Charitini Nepka, Demetrios A. Spandidos and Aristidis Tsatsakis.(2019) Sperm telomere length: diagnostic and prognostic biomarker in male infertility (review). World Academy Of Sciences Journal 1: 259-263, 2019. **(IF=2.11)**
5. **Amir S**, Khan J, Afzal MS, Amen NE, Raza H, Safdar W, Ahmed H, Bostan N. Molecular epidemiology and genotyping of SEN Virus in thalassemia patients in Pakistan. Infect Genet Evol. 2016 Oct;44:300-302. doi: 10.1016/j.meegid.2016.07.019. Epub 2016 Jul 19. PMID: 27449954. **(IF=4.393)**

Co- Author Publications

6. Ejaz M, Usman SM, **Amir S**, Khan MJ. Holistic expression of miR-17-92 cluster in obesity, kidney diseases, cardiovascular diseases, and diabetes. Mol Biol Rep. 2023 Jun 17. doi: [10.1007/s11033-023-08549-4](https://doi.org/10.1007/s11033-023-08549-4). Epub ahead of print. PMID: 37329480. **(IF=2.742)**
7. Bello JH, Khan MJ, **Amir S**, Kakakhel HG, Tahir F, Sultan S, Raza SQ, Mamoulakis C, Zachariou A, Tsatsakis A, Sofikitis N, Shah STA. Dysregulation of mitochondrial sirtuin genes is associated with human male infertility. Andrologia. 2022 Feb;54(1):e14274. doi: 10.1111/and.14274. Epub 2021 Oct 18. PMID: 34664305. **(IF=2.532)**
8. Suvorov A, Salemme V, McGaunn J, Poluyanoff A, Teffera M, **Amir S**. Unbiased approach for the identification of molecular mechanisms sensitive to chemical exposures. Chemosphere. 2021 Jan;262:128362. doi: 10.1016/j.chemosphere.2020.128362. Epub 2020 Sep 18. PMID: 33182146.. **(IF=8.943)**
9. Suvorov A, Salemme V, McGaunn J, Poluyanoff A, **Amir S**. Data on chemical-gene interactions and biological categories enriched with genes sensitive to chemical exposures. Data Brief. 2020 Oct 9;33:106398. doi: 10.1016/j.dib.2020.106398. PMID: 33102660; PMCID: PMC7578666.. **(IF=1.113)**
10. Zaufishan B, Kabir A **Amir S**, Faryal F. (2012) Relationship Of Symptoms With Demographic Features In Case Of Thyroid Disorders In Pakistani Population. Asian Journal of Biomedical & Pharmaceutical Sciences. Vol 2, No 12.

Conference Publications:

1. **SOT Nashville, TN, USA March 2023.** Saira Amir, Syed Tahir Abbas Shah, Joseph McGaunn, Alexander Suvorov. mTOR Dependent Disruption of the Blood-Testis Barrier: a Potential Novel Mechanism of Male Reproductive Toxicity.
2. **SOT Anaheim, California, USA March 2020.** S. Amir, S. T. Shah, V. Salemme , J. McGaunn, and A. Suvorov. An mTOR-dependent regulation of the blood-testis barrier - a potential novel mechanism of male reproductive toxicity.
3. **SOT Baltimore USA, March 2019.** S. Amir¹, M. Tzatzarakis, S. A. Shah, S. Eqani, H. Ali, A. Suvorov, F. Tahir, S. Sultan, and A. M. Tsatsakis. Effect of Serum Organochlorine Pollutants (DDTs, HCB and PCBs) Levels on Human Sperm Parameters.
4. **EUROTOX Bratislava, Slovakia September 2017.** Saira Amir, Manolis Tzatzarakis, Raheel Qamar, Arsitides M. Tsatsakis, Syed Tahir Abbas Shah. Higher levels of DDTs and PCBs in hair of infertile people suggest their link with infertility.
5. **EUROTOX Bratislava, Slovakia September 2017.** Saira Amir, Manolis Tzatzarakis, Raheel Qamar, Syed Tahir Abbas Shah, Arsitides M. Tsatsakis. Association of PCBs and DDT with infertility in Pakistani population
6. **CADR-PSBMBT 2016 - CIIT Abbottabad.** Saira Amir, Syed Zain Hussain, Muhammad Imran Ramzan, Haider Ali, Alamdar Hussain, Aamira Tariq, Sikandar Sultan, Faheem Tahir, Muhammad Jadoon Khan, Raheel Qamar, Syed Tahir Abbas Shah. Association of KLHL-10 and SDHA with Human Male Infertility in Pakistani Population.
7. **CADR-PSBMT-2016- CIIT Abbotabad.** Maria Arshad, Mahnoor Akram, Saira Amir, Asma Amjad, Alamdar Hussain, M Qaiser Fatmi, Syed M Nurulain. Novel acetylcholinesterase reactivator for organophosphate poisoning
8. **San Antonio Breast Cancer Symposium.** 2010 S Amir, S Bilal, W Ahmed, M Zahid, and F. Mustafa. Preliminary Studies Characterizing the prevalence of Human Mammary Tumor Virus (HMTV) In Human Breast carcinomas of Pakistani patients. American Journal of Cancer Research Vol. 70
9. **Emirates Oncology Conference, Abu Dhabi, United Arab Emirates.** November 8-10. Ahmed W, Amir S, and Mustafa F. (2012) Characterization of MMTV-like sequences isolated from Pakistani breast cancer patients.

Graduate Thesis Supervised:

1. Hareem Qadeer
Thesis Title: [Expression of NOTCH1 Gene in Breast Cancer Patients and its Association with Disease Progression.](#)
2. Fatima Faisal
Thesis Title: [Trends of Semen Parameters in Pakistan.](#)
3. Maheen Ejaz
Thesis Title: [Expression Analysis of Circulating miRNA-17-5p and its Target Genes in Chronic Kidney Disease.](#)
4. Khushbakht

Thesis Title: [Differentially Expressed MicroRNAs \(miRNAs\) and Regulated Genes in Female Reproductive Tract.](#)

5. Tehniat Shaukat

Thesis Title: [Evaluation of miRNAs and Their Target Genes in Male Infertility.](#)

6. Jahangir Khan:

Thesis Title: [Molecular epidemiology and genotyping of SEN Virus in thalassemia patients in Pakistan.](#)

Undergraduate Thesis Supervised:

1. Shermeen Syed and Shandana Qasim: BS(Biosciences)

Thesis Title: [Impact of HCB and DDTs on Female Infertility](#)

2. Sammar and Nimra Khan: BS (Biosciences)

Thesis Title: [Possible Impacts of PCBs on Female Reproductive Health](#)

3. Wishah Khalid:

Thesis Title: [Expression of Selected miRNAs and target Genes in Male Infertility](#)

4. Hareem Qadeer and Madiha Aftab: BS (Biosciences)

Thesis Title: [Expression of Selected miRNAs and Target Genes in Male Infertility](#)

5. Fatima Faisal: BS (Biosciences)

Thesis Title: [MiRNA Expression Analysis of Claudins in Cervical Cancer](#)

6. Zunaira Eman and Sara Khan: BS(Biosciences)

Thesis Title: [Association of Telomere Length and miRNAs with Cervical Cancer](#)

7. Jawariya Arshad and Kiran Ameer:

Thesis Title: [Micro RNA's And Targeted Pathways in Cervical Cancer](#)

8. Maryam Javed and Eman Fatima:

Thesis Title: [Association of microRNAs with Female Reproductive Tract Disorders](#)

9. Momina and Minahil: BS(Biosciences)

Thesis Title: [Association of Vitamin D deficiency with female infertility](#)

10. Pakeeza Ashraf and Javeria Iqbal: BS (Bioinformatics)

Thesis Title: [Effects of Cannabis Exposure on Sperm DNA Methylation](#)

11. Hoor Gulalai Kakakhel: BS (Biosciences)

Thesis Title: [Association of Sperm Telomere Length \(STL\) with Male Infertility](#)

12. Zain Husnain

Thesis Title: [Association of Selected Genes with Human Male Infertility in Pakistani Population](#)

13. Alishba Altaf and Sadia Naseer: BS(Bioinformatics)

Thesis Title: [Identification of Molecular Pathways Susceptible to Altered Sperm Methylome by Chemical Exposure](#)

14. Mahnoor Azim: BS (bioinformatics)

Thesis Title: [Effects of Heavy Metals Exposure on Liver Toxicity](#)

15. Hameed Ramzan: BS (Bioinformatics)

Thesis Title: [Mutational Modeling of Barley Yellow Dwarf Virus](#)

16. Bareera Zaufishan and Afreen Kabir: BS(Bioinformatics)

Thesis Title: [Relationship Of Symptoms With Demographic Features In Case Of Thyroid Disorders In Pakistani Population](#)

Teaching, Research, and Related Administration

Courses taught:

1. BIO 233 Developmental biology Credit Hours (Theory, Lab) 4(3,1)
2. CS 504 Theory of Automata Credit Hours (Theory, Lab) 3(3,0)
3. BIO 310 Introduction to Bioinformatics Credit Hours (Theory, Lab) 4(3,1)
4. BIO 210 Linux for Biological Sciences Credit Hours (Theory, Lab)3(1,2)
5. BIO 424Bioinformatics Software Development. Credit Hours (Theory, Lab) 3(2,1)
6. BSC 300 Environmental Biology credit hours (Theory, Lab)3(3,0)
7. BSC 100 Introduction to Biosciences Credit Hours (Theory, Lab) 3(3,0)
8. BSC 204 Cell Biology Credit Hours (Theory, Lab)4(3,1)

Member Graduate Committee

Member Admission Committee: Main responsibilities included evaluating the admission forms for eligibility, calling and facilitating prospective students for interviews and admission tests.

Orientation Day reception: Each semester new students are invited with their parents for orientation, I am mainly responsible for welcoming the guests and organizing the guided tour of the campus.

Organizing National Youth Camps 1 and 2 and 2008 and 2010: Each year Pakistan Red Crescent Society organized a youth camp where participants from different regional societies from all over Pakistan Participate. I attended two starting camps as the organizer and was responsible to smooth boarding and lodging of participants and act as convener in many training workshops and activities.

Extra-Curricular Activities/ Distinctions:

1. First prize in poster competition BIOPEC 2011 organized by CIIT.
2. Won first prize in poster competition of World's AIDS Day 2008.
3. Won second prize in a Poster competition on climate change in 2010.
4. Second prize in the Calligraphy competition in IIUI, 2004.

Training / Workshops

1. 1st National Youth Camp (Pakistan Red Crescent Society Islamabad)
2. Outcome-based learning (Faculty Development Academy, CIIT)
3. Communication Skills in Teaching (Higher Education Commission, Islamabad)
4. Knowledge-Based Learning (CIIT, Islamabad)
5. Techniques in Molecular Biology (KRL HOSPITAL Islamabad)
6. First Aid (Pakistan Red Crescent Society Islamabad)
7. ABCD of Disaster (Pakistan Red Crescent Society Islamabad)
8. Emergency Response (Al-Sadiq Trust Islamabad)