

RUBINA MUSHTAQ

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PRESENT POSITION

- Volunteer researcher at School of Biological Sciences, Pk.

EDUCATION

- PhD** Subject: Biological Sciences (Plant Biotechnology) July 2019
Dissertation: “*Production of Bacillus thuringiensis Recombinant Cry Proteins and Analysis of Mode of Action of their Toxicity*”
Advisor: Prof. Dr. AR. Shakoori
Foreign Advisor: Dr. Juan Luis Jurat-Fuentes (UTK, USA)
University: School of Biological Sciences, University of the Punjab
- MPhil** Subject: Biological Sciences (Cell and Molecular Biology) 2010-2012
Thesis: “*Cloning and Expression of C-Terminally Truncated cryI_{Ac} gene*”
Advisor: Prof. Dr. AR. Shakoori
University: School of Biological Sciences, University of the Punjab
- MSc** Subject: Botany 1999-2001
Specialization: Plant Tissue Culture and Environmental Bacteriology
University: Department of Botany, University of the Punjab
- BSc** Subject: Botany, Zoology and Chemistry 1997-1999
College: Queen Mary College, Lahore
- BEd** Result Awaiting (Alama Iqbal Open University) Expected 2019

RELEVANT COURSEWORK

Biochemistry, Cell Biology, Molecular Biology, General and Medical Genetics, Analytical and Mechanistic Enzymology, Protein Chemistry and Enzymology, Virology, Signal Transduction, Recombinant DNA Technology, Plant Tissue Culture, Environmental Bacteriology and Subdisciplines of Botany.

HONORS AND AWARDS

- IRSIP Scholarship** 2016
IRSIP Scholarship award from Higher Education Commission of Pakistan to conduct part of PhD research at **University of Tennessee, Knoxville, USA** for a period of 6 months during 2016.
- Comprehensive Examination** 2014
Passed Comprehensive examination with **Grade Point 4.0 (A⁺)** holding second position in School of Biological Sciences.
- MPhil 2nd Position** 2012
Secured Second position in MPhil, with CGPA 3.66 at School of Biological Sciences, University of the Punjab.
- International GRE Subject** 2011
Secured **75 Percentile in International GRE Subject** (Biochemistry, Cell and Molecular Biology, Genetics) test holding second position in School of Biological Sciences in 2011.
- Fellowship Award** 2010-2015
Fellowship award for **M. Phil leading to Ph.D.** from School of Biological Sciences, University of the Punjab, Lahore for a period of five years.

TEACHING EXPERIENCE

- University of Central Punjab, Lahore** 11th Mar-to-20th July 2019
Visiting Lecturer, Biotechnology
- Taught Immunology to Biotechnology 5th Semester
 - Developed quizzes, exams, and took presentations
 - Evaluated students for their class participation and project presentation
- Govt. Post Graduate Islamia College (W) CR, Lahore** 16th Aug-to-31st Oct 2018
Lecturer, Biology/Botany
- Taught Plant Physiology to BS Zoology and Chemistry classes
 - Taught Plant Taxonomy to BS Zoology
 - Assigned assignments and took examination
 - Conducted labs with a team of two lab attendants
- Concordia College, Khudian Khas** May 2017-to-May 2018
Lecturer, Biology
- Taught Biology to Pre-medical classes
 - Developed quizzes, exams, and homework
 - Revised the syllabus to meet accreditation standards
 - Conducted labs and coordinated with other staff.

RESEARCH EXPERIENCE

School of Biological Sciences, University of the Punjab

2011-2018

Advisor: Prof. Dr. AR. Shakoori

Duration: Seven years

- Learnt how to plan a project, work independently and utilize available resources
- Successfully planned and completed PhD project with the construction of novel recombinant protein possessing higher toxicity.

University of Tennessee, USA

2016

Advisor: Prof. Dr. Juan Luis Jurat-Fuentes

Duration: Seven months

- Learnt important techniques and improved scientific approach
- Enabled me to critically interpret and present data

PROFESSIONAL SKILLS

- **Microbiology**
 - Establishment of aseptic conditions for bacterial culturing
 - Sampling microbes from different environments
 - Culturing, isolation and identification of bacteria
- **Microscopy:** Light microscopy and Fluorescent-microscopy
- **Biochemistry and Molecular Biology Techniques**
 - Recombinant DNA Technology; PCR, Gene Cloning and analysis
 - RNA Isolation, RT-PCR and Real Time PCR (qPCR)
 - Production of Fusion Proteins and Optimization of Over-Expression
 - Insoluble Protein Refolding with different approaches
 - Protein Purification using different methods; Affinity Chromatography, Ion-Exchange Chromatography, Size-Exclusion Chromatography, Fast-Protein Liquid Chromatography. Protein Characterization.
- **Immunology;** Antisera raising, Western blotting, ELISA, Ligand blotting, Developing X-Ray films
- Plant tissue culture and Transformation.
- **Bioinformatics;** Image-j software, SigmaPlot, online tools for DNA and Protein homology analysis, genome analysis and editing. Different important bioinformatics tools like protein structure prediction and molecular docking.

PUBLICATIONS

Journal Publications

1. **Mushtaq, R.**, Shakoori, A.R. and Jurat-Fuentes, J.L., 2018. Domain III of Cry1Ac Is Critical to Binding and Toxicity against Soybean Looper (*Chrysodeixis includens*) but Not to Velvetbean Caterpillar (*Anticarsia gemmatilis*). ***Toxins***, 10(3):95. **IF: 3.895**, Citations: 4.
2. **Mushtaq, R.**, Behle, R., Liu, R., Niu, L., Song, P., Shakoori, A.R. and Jurat-Fuentes, J.L., 2017. Activity of *Bacillus thuringiensis* Cry1Ie2, Cry2Ac7, Vip3Aa11 and Cry7Ab3 proteins against *Anticarsia gemmatilis*, *Chrysodeixis includens* and *Ceratomya trifurcata*. ***J. Invertebr. Pathol.***, 150: 70–72. **IF: 2.101**, Citations: 2.

Journal Papers Under Process

1. **Mushtaq, R.** and Shakoori, A.R. “Proteomic analysis of tnCry1Ac and Cry2Ac7 protoxins and their insecticidal activity against *Spodoptera litura*” (under process).
2. **Mushtaq, R.** and Shakoori, A.R. “Identification of new proteins for pyramiding in transgenic soybeans to resist infestation of *Pseudoplusia includens* and *Anticarsia gemmatilis*” (finalizing manuscript).

PRESENTATIONS AND CONFERENCES

- Oral presentation on “**Production of recombinant hybrid Cry1Ac protein and analysis of effect of recombination on the toxicity of parent protein**” in the 38th Pakistan of Congress of Zoology (International) on Feb 27-March 1, 2018.
- **Importance of Domain III in Cry1Ac for toxicity against the soybean looper (*Chrysodeixis includens*)**. Oral presentation by corresponding author at the 50th International Meeting of the **Society for Invertebrate Pathology, San Diego (CA), USA**. 14th August 2017.
- Oral presentation at 33rd Pakistan of Congress of Zoology (International) on “**Cloning and over-expression of C-Terminally Truncated cry1Ac Gene of *Bacillus thuringiensis***” 2013.
- Active participation in **International Conference of Pakistan Congress of Zoology**, 2011.
- Participation in **11th Biennial Conference of PSBMB** entitled **Molecular Biosciences-Challenges and Opportunities**, 2013.

PROFESSIONAL TRAINING WORKSHOPS

- **3-Day International ICGEB Workshop “Use of Genome Editing & other New Breeding Technologies for Global Food Security”** happened on April 8-10, 2019 at COMSTECH, Islamabad, Pakistan.
- **“2-Day National Workshop on Biotechnology: From Molecular Cloning to Drug Development”** held on April 19-20, 2018 at International Islamic University Islamabad.
- Training Course on **“Diagnosis of Viral Diseases”**, Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad (September 19-20, 2017).
- Hands on experience workshop on **Enzyme Immunoassays**, Shaikh Zayed medical complex, Lahore (December 10-12, 2013).
- Workshop on **Fluorescent Microscopy: Introduction and Applications**, MMG, university of the Punjab, 24th Sep, 2011.

MEMBERSHIP

- Life time member of **Teaching and Education Research Association (TERA)**

REFERENCES

Professor Dr. AR Shakoori
Professor Emeritus
School of Biological Sciences
University of the Punjab, Pakistan
Phone: 92-42-99230133
Email: arshakoori.sbs@pu.edu.pk

Professor Dr. Juan Luis Jurat-Fuentes
Entomology and Plant Pathology,
University of Tennessee,
Knoxville Tennessee, USA
Email: jurat@utk.edu

Professor Dr. Javed Iqbal
Professor Emeritus
School of Biological Sciences
University of the Punjab, Pakistan
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