

# CURRICULUM VITAE

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**Name:** Uzma Badar, Ph.D.

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Professor / Director

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## PROFILE

A dedicated, experienced, and motivated professional with expertise in Microbial Genetics. Uses various methods to isolate and characterize bacterial cultures and investigates the development of environmentally friendly technologies. Also deals with plant viruses, cloning, and transformation of the viral gene into plants via *Agrobacterium* and hands-on in plant tissue cultures. Keen and analytical thinker in solving complex research and laboratory challenges; experienced in course planning and creative instructional style.

## EDUCATIONAL QUALIFICATION

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### Post Doc: Molecular Biology

Dept. of Cell and Systems Biology, University of Toronto, Toronto, Canada 2019

### Ph. D: Genetics

2004

Thesis subject: **Genetic Studies and removal/Detoxification of Copper and Chromate by Bacterial Isolates**

### M.Sc. Genetics

1995

Thesis subject: **Biofilm formation by copper-accumulating *Acinetobacter* sp.**

## TEACHING EXPERIENCE

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Professor, Dept of Genetics, University of Karachi	2014-to date
Associate Professor, Dept of Genetics, University of Karachi.	2009 - 2014
Asst. Professor, Dept of Genetics, University of Karachi.	2006 – 2009
Research Officer at the Center for Molecular Genetics	2006-2006
Teaching Assistants (Lecturer), Department of Genetics, The University of Karachi.	2000 - 2006

Taught undergraduate courses in Microbial Genetics, Evolution, and Behavioral Genetics to undergraduate students and also graduate courses in Genetics and Protein Structure and Function. Conducted labs in Cytogenetics, Human Genetics, Microbial Genetics, Genetic Engineering, Classical Genetics, and Biostatistics.

## RESEARCH EXPERIENCE

### **STUDENTS SUPERVISED**

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Fourteen Research Student (M. Sc) was supervised from the period of 2007-to 2021. One Ph.D. produced and one is currently enrolled.

Post doctorate studies conducted at cell and system biology dept. of Biological Sciences, University of Toronto, Toronto. 2016-2019.

## HONORS:

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<b>Dean's Office Project, Karachi of University</b>	2012-2013
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Expression of lux genes in *E. coli*: Transformation.

<b>Dean's Office Project, Karachi of University</b>	2011
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Extraction and purification of luciferase enzyme.

<b>Dean's Office Project, Karachi of University</b>	2009
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Project entitled as "I. Identification and characterization of luminescent bacterial strain".

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### **Presidential Young Innovators (PYI) Award (2007-2009) (PI)**

Project entitled "Construction of multiplex biosensor for the monitoring of heavy metal contaminants in the polluted environments or industrial effluent".

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<b>Dean'S Office Project, Karachi OF University</b>	2007
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Project entitled as "Screening of Reporter genes in bacteria."

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<b>HEL Link Program (U.K.)</b>	2000
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Three-month research project at Dundee University

Dundee, Scotland- UK.

<b>EPA Project</b>	1998-1999
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Removal of Heavy Metal Pollutant(s) from Effluents Using Biotechnology from Pakistani Resources. **News was shown on Zee Europe** 26<sup>th</sup> August 1999 and on Pakistan television (Ptv) in **Karobari dunyan**.

I have established the technology of biofilm formation using indigenous waste material such as foam sponge, etc.

<b>HEL Link Program (U.K.)</b>	1998
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Three-month research project at Birmingham University, Birmingham, U.K.

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## PUBLICATIONS

1. Uzma Badar, Srividhya Venkataraman, Mounir AbouHaidar, and Kathleen Hefferon. 2021. Molecular interactions of plant viral satellites. *Virus Genes*, 57:1–22 <https://doi.org/10.1007/s11262-020-01806-9>.
2. Erum Shoab, Badar, U., Ventataraman, S., and Hefferon, K. Crispr/ Cas9 and Cas13a systems: A promising tool for plant breeding and plant defence. 2021. In Book, CRISPR and RNAi system: Nanobiotechnology approaches for plant breeding and protection. Kamel A Abd., Elsalam and Ki- Taek Lim (Eds).
3. Hefferon, K, Borja Cantero-Tubilla, Uzma Badar., Wilson, D. W. 2020. Plant Based Cellulase Assay Systems as Alternatives for Synthetic Substrates. *Applied Biochemistry and Biotechnology*, vol, 192, 1318-1330.
4. Ventataraman, S., Badar, U., and Hefferon, K. 2019. Agricultural Innovation and the Global Politics of Food trade. In: Ferranti., P., Berry, E. M. Anderson, J. R. (Eds). *Encyclopedia of Food Security and sustainability*, vol,1, pp. pp. 114-121, Elsevier, ISBN: 9780128126875.
5. Hefferon, K, Borja Cantero-Tubilla, Uzma Badar. Production of a Universal plant based- Based Substrate System for Cellulase Activity Assay. (poster)
6. Hefferon, K, Mahbobeh Zamani-Babgohari, Ventataraman, S., Badar, U., Mehmood, N. 2019. A Novel Delivery System and Therapy for Middle East Respiratory Syndrome Coronavirus. (poster).
7. Uzma Badar, Erum Shoeb, Jameela Akhtar, Komal Daredia and Obaid Yosuf Khan. 2018. PCR based gene identification of lux operon in luminescent *Vibrio chagasii* isolated from Karachi Coast. *J. Biol. Biotech* vol: 15(1)
8. Shoeb E., Ahmed N., Akhter J., Badar U., Siddiqui K., Ansari F., Waqar M., Imtiaz S., Akhtar N., Shaikh Q.A., Baig R., Butt S., Khan S., Khan S., Hussain S., Ahmed B. and Ansari M.A., 2015. Screening and Characterization of biosurfactant producing bacteria isolated from Arabian Sea coast of Karachi. *Turkish Journal of Biology*, 39(2): 210-216. DOI: 10.3906/biy-1405-63 [Impact Factor: 1.216].
9. Maheen Waqar, Uzma Badar, Erum Shoeb. 2014. Genetic and environmental dynamics to drug addiction: *International Journal of Prevention and Treatment of Substance Use Disorders*, Volume 1 (2). 53-62.
10. Uzma Badar, Nuzhat Ahmed, Erum Shoeb, and Geoffrey M Gadd. 2014. Identification of the *pco* operon in *Enterobacter* species isolated from contaminated soil. *International Journal of Advanced Research*, Volume 2, Issue 3, 227-233.
11. Maqsood Ali Ansari, Samina Imtiaz, Erum Shoeb, Uzma Badar and Obaid Yousuf Khan. 2014. Determination of Antibiotic and Metal Resistance Patterns in Bacteria Isolated from Potable Water from Karachi, Pakistan. *International Journal of Advanced Research*, Volume 2, Issue 1, 333-341.
12. Erum Shoeb, Uzma Badar, Faiza Akhlaq, Faiza A. Ansari, Samina Imtiaz and Jameela Akhter. 2013. Determination of stress resistance in biosurfactant-producing bacterial isolates. *Int. J. Biol. And Biotechnol.*, 10 (3): 419-426.
13. Uzma Badar, Nuzhat Ahmed and Erum Shoeb 2013. Bioaccumulation and biosorption of copper by *Pseudomonas* species. *Int. J. Biol. Res.*, 1(1): 67-73.

14. Jameela Akhter, Nuzhat Ahmed, Uzma Badar, Maheen Waqar and Erum Shoeb. 2013. Heavy metal and antimicrobial resistant bacteria isolated from Karachi coastal area as an indicator of pollution. *Int. J. Biol. Res.*, 1(1): 57-66.
15. Uzma Badar, Erum Shoeb, Fouad M Qureshi, Jameela Akhtar, Nuzhat Ahmed. 2013. Removal of copper via bioreactor by soil isolate *pseudomonas stutzeri*. *Academic Research International*. Vol 4(3).
16. Erum Shoeb, Faiza Akhlaq, Uzma Badar, Jameela Akhter, Samina Imtiaz. 2013. Classification and industrial applications of biosurfactants. *Academic Research International*. Vol 4(3).
17. Shoeb E., Badar U., Akhter J., Ansari F.A., Waqar M. and Ansari M.A., 2012. Screening of surfactant producing bacterial strains isolated from soil samples of an automobile workshop. *Karachi University Journal of Science* 40, 31-36.
18. Badar U., Shoeb E., Daredia K., Shawar D., Akhtar J. and Ansari M. A., 2012. Screening and Characterization of Luminescent Bacterial Strain. *Journal of Basic & Applied Sciences* 8, 602-606 ISSN: 1814-8085 / E-ISSN: 1927-5129/12 © 2012 Life science Global.
19. Shoeb E., Badar U., Akhter J., Shams H., Sultana M. and Ansari M.A., 2012. Horizontal Gene Transfer of Stress Resistance Genes through Plasmid Transport. *World J Microbiol Biotechnol* 28(3):1021–1025: DOI 10.1007/s11274-011-0900-6.
20. Affan Q., E. Shoeb, U. Badar, J. Akhtar, 2009. Isolation and characterization Of Bacterial Isolates Having Heavy Metal Tolerance. *Journal of Basic and Applied Sciences*. Vol. 5, No. 2, 55-60.
21. Farooq S, E. Shoeb, U. Badar, J. Akhtar, 2008. Isolation and characterization Of Copper Tolerant Bacterial Isolates. *Pakistan journal of biochemistry and molecular Biology*, 41(4): 176-180.
22. Nuzhat Ahmed, Uzma Badar and Afsheen Arif. 2006. Recycling of Metal Contaminated Wastewater. A case study". *Pakistan Journal of Biochemistry and Molecular Biology*, Vol 39, No.1-2.
23. Nuzhat Ahmed, Afsheen Arif, Aisha Nawaz and Uzma Badar (2005). Optimization of Chromate Reduction by Indigenous Bacteria. *Pak. J. Biochem. Mol. Biol.* 38(1-2): 45-48.
24. Ahmed, N., A. Nawaz, U. Badar 2005. Screening of Copper Tolerant Bacterial Strains and their Potential to remove Copper from the Environment. *Bulletin of Environmental Contamination and Toxicology*. 74 (2).
25. Pattanapitpaisal P, Mabbett AN, Finlay JA, Beswick AJ, Paterson-Beedle M, Essa A, Wright J, Tolley MR, Badar U, Ahmed N, Hobman JL, Brown NL, Macaskie LE. 2001. Reduction of Cr(VI) and bioaccumulation of chromium by gram positive and gram negative microorganisms not previously exposed to Cr-stress. *Environmental Technology*. vol 7, 731-745.
26. Qureshi, F. M., J. Akhtar, U. Badar, F. Fasim, S. Raihan, M. T. Hasan and N. Ahmed. 2001. Towards effective bioremediation in third world countries. *J. Contaminated soils, sediments and water*. Oct. 2000, 310-316.
27. Qureshi, F. M., U. Badar, and N. Ahmed. 2001. Biosorption of copper by bacterial biofilm on PVC flexible conduit. *Applied and Environmental Microbiology*, Vol. 67 (9), 4349-4352.
28. Badar, U., N. Ahmed, A. J. Beswick, P. Pattanapitapaisal and L. E. Macaskie. Reduction of chromate by microorganisms isolated from metal contaminated sites of Karachi, *Pakistan. Biotech. Lett.* 22: 829-836, 2000.

29. N. Ahmed, U. Badar, M-T. Hassan & S. Raihan (1997). Isolation of Local Copper Tolerant Bacteria in Pakistan for Biofilm Formation on Various Supports and Subsequent Biosorption. *Resource and Environmental Biotechnology*. Vol 2, pp. 65-72.

## PRESENTATIONS AT NATIONAL & INTERNATIONAL CONFERENCES

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### *Paper (Oral) Presentations:*

- “An overview on Luminescent bacterial strain.” In a workshop on Genetic Diseases in Pakistani Population. Newcastle University, U.K. 5-10<sup>th</sup> July 2010.
- “Isolation and Characterization of Luminescent Bacteria From Arabian Sea”, in *Enviro Arabia 2010, 6<sup>th</sup> Specialty Conference and Exhibition on Environmental Progress in the Petroleum and Petrochemical Industries*, April 18<sup>th</sup> – 21<sup>st</sup>, 2010, at Gulf International Convention Centre Gulf Hotel, Kingdom of Bahrain.
- “Isolation and characterization of luminescent bacteria from Arabian Sea” in 35<sup>th</sup> All Pakistan Science Conference on “Genomics for Health and Prosperity”. In University of Karachi, 20-23 December, 2008.
- “Biosensors in Agriculture: Luminescent Bacterial Strain”, in 4 days workshop on Biofertilizers, Importance and development using Indigenous Resources at Karachi University, 17<sup>th</sup> -20<sup>th</sup> August 2009 organized by Centre for Molecular Genetics, University of Karachi, British Council and DFID.
- “The *Pco/Cop* Copper Resistance Operon in Bacterial Species Isolated from Metal Contaminated Soil.” In an international symposium on Genomics, Proteomics, Metabolomics: Recent Trends in Biotechnology, University of Punjab, Lahore, 22<sup>nd</sup> -23<sup>rd</sup> October 2007.

- “Identification of the copper-resistance operon in *Enterobacter* species isolated from soil.” In an 4<sup>th</sup> International Symposium on Genetic Engineering and Biotechnology 4-8 December 2005, Karachi Pearl Continental Hotel.
- Genetic Counselling and Screening a training workshop in collaboration with HEC on “Genetics for Medical Professionals” at Karachi University, 6<sup>th</sup>-11<sup>th</sup> Dec. 2004.
- Seminar on “Air Water and Ecosystem: Our Children’s Heritage” in collaboration with British Council and University of Birmingham, 20<sup>th</sup> March’03.
- “Biofilm formation by Copper accumulating bacterial isolates.” Third International Symposium on Genetic Engineering & Biotechnology, 24-28<sup>th</sup> Feb. 1998.
- “Genetics of copper resistance in indigenous bacterial isolates from tannery Effluents”, In an international symposium on Genetics for a better future in Islamabad, November 26-28<sup>th</sup> 1996.

## ABSTRACTS IN REFEREED PROCEEDINGS

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- **Badar, U.**, R. Abbas and N. Ahmed. 2001. Characterization of Copper and chromate resistant bacteria isolated from Karachi tanneries effluents. In Ahmed, N., Qureshi., F. M., and Khan, O.Y (eds). Industrial and Environmental Biotechnology. 43-53. Horizon Scientific Press, Norfolk, U.K.
  - Ahmed, N., S. Raihan and **U. Badar**. (2000). Microbial process for pollution control: Bioremediation. In proceeding Geoengineering in Arid Lands, Mohamed & Al Hosani (eds), Balkema, Rottardam, ISBN press, 571-576.

- Ahmed, N., **Badar, U.** and Raihan, S. Resistance and Accumulation of Heavy Metals by Indigenous Bacteria: Bioremediation (2001). In Proceeding: In Ahmed, N., Qureshi., F. M., and Khan, O.Y (eds). Industrial and Environmental Biotechnology. 43-53. Horizon Scientific Press, Norfolk.
  - Ahmed, N., F. M. Qureshi and **U. Badar.** 2001. Biotechnological approaches for the control of environmental pollution: bioremediation. Proceedings of the first international Conference on Biotechnology Applications for the Arid Regions. 9-11 April 2001. Hosted by Kuwait Institute for Scientific Research, Kuwait.
  - Ahmed, N., **U. Badar,** F. Fasim and F. Qureshi. Recycling of Metal Contaminated Wastewater: A Case Study. 2002. **In Environmental and ground water pollution**, Sherif, M., Singh. V. P. and Al Rashid (eds), Swets & Zeittlinger Publication USA. pp. 175-186.
  - Ahmed, N., **U. Badar,** F. M. Qureshi and F. Fasim 2003. Biosorption and Bioaccumulation of Heavy Metals by bacteria isolated from contaminated sites of Karachi, Pakistan. IBS 2003 Proceedings.
  - Ahmed N., **U. Badar,** and T. Moatter, 2005. Identification of the copper-resistance operon in *Enterobacter* species isolated from soil. In an 4<sup>th</sup> International Symposium on Genetic Engineering and Biotechnology.
  - **Badar U,** Erum Shoeb and Nuzhat Ahmed. 2010. Isolation of Luminescent Bacterial Strains from Sea Organisms and Karachi Coastal Areas. In proceedings of EnviroArabia 2010, 6<sup>th</sup> Speciality Conference on Environmental Progress in the Petroleum and Petrochemical Industries.
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## SEMINARS AND CONFERENCES ORGANIZED

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### *Member of organizing committee*

Organized a training workshop in collaboration with HEC on "Genetics for Medical Professionals". 2004. Karachi, Pakistan.

"Air Water and Ecosystem: Our Children's Heritage" in collaboration with British Council and University of Birmingham, 20<sup>th</sup> March'03. Birmingham U.K.

**"Antibiotic Abuse; A major threat to human health."** By Dr. Hilary K. Young, university of Dundee, U.K.. 2001.

**"Metal Microbe interaction"** by Prof. Geoff M. Gadd, University of Dundee. U.K. **21st March'2000.**

A workshop on **"Price of a leather** Social and economical cost of having tanneries in Karachi in collaboration with the British Council and Pakistan Tanners Association on Oct 17, 2000. Pakistan **Oct 17, 2000.**

An international Conference on **"Hazardous effects pollutants on women workers"** 16th-18th Dec' 1996. This was sponsored by Overseas Development Administration U.K.

Third International Symposium on Genetic Engineering & Biotechnology with the theme of **Industrial & Environmental Biotechnology** 24-28th Feb'1998 at Hotel Marriott, Karachi.

A National Conference on **Human Rights based strategies for women during pregnancy"** Feb16-18Feb'1999. Karachi

Workshop on "No Water No Life" in collaboration with British Council and University of Birmingham, Birmingham U.K. 1999.

Seminar on **"Biotechnological Application of Metal-reducing Bacteria Bioremediation"** by Dr. John R. Lloyd School of Biological Sciences University of Birmingham. U.K. **15th May 1997.**

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