Dr. Puja Yadav; PhD
Assistant Professor
Department of Microbiology
Central University of Haryana
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EDUCATIONAL QUALIFICATIONS

- 2015: Certificate/Diploma in 'Teaching Skills and Research Ethics', University of Texas, Houston, Texas, USA (2015).
- 2008: PhD; School of Bioscience, Jamia Milia Islamia and School of Life Sciences; Jawaharlal Nehru University, New Delhi, India. (Supervisor: Prof. Arif Ali and Prof. Atul Kumar Johri)
- 2000: MSc; M.S.J college, University of Rajasthan, Jaipur, India.

RESEARCH/TEACHING EXPERIENCE

- Feb 2016- : Assistant Professor, Central University of Haryana, Mahendergarh, Haryana.
- September 2015-Decembe 2015: Amity Institute of Microbial Technology, Amity University, Noida, India.
- 2013-2015: Postdoctoral Fellow, Department of Microbiology and Molecular Genetics, University of Texas, Houston, Texas, USA. (Prof. Nayun Kim's laboratory).
- 2009-2011: Postdoctoral Fellow, Infectious Diseases Department, Children's Hospital, Harvard Medical School, Boston, Massachusetts, USA. (Prof. Richard Malley's laboratory).

AWARDS AND HONORS

- 2015: First Prize for Young Women Scientist award in Association of Microbiologist of India Conference
- 2015: Member, postdoctoral Travel Grant committee, University of Texas, Houston, Texas, USA.
- 2014: 3rd Position in Poster Presentation in Molecular Biology of Infectious Diseases symposia, University of Texas, Houston, Texas, USA
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- 2014: Invited Judge for Medical School retreat, University of Houston, Houston, Texas, USA.
- 2010: Travel Grant for oral presentation for ISPPD (International Conference on Pneumococci and Pneumococcal Diseases)
- 2004: Research Fellowships, Council of Scientific and Industrial Research, India

SPONSORED PROJECTS

- 2016: **SERB early Career Research Award**
- **Funding Agency:** Department of Science and Technology
- **Project title:** "Identification and functional characterization of G4 DNA in *Helicobacter pylori:* a novel therapeutic target"
- **Project amount:** 45.00 Lacs
- **Duration:** 2016-2019

PUBLICATIONS

1. Montealegre MC, Singh KV Somarajan SR , **Yadav P** , Chang C , Spencer R, Sillanpää J, Ton-That H, Murray BE. Role of the Emp Pilus Subunits of Enterococcus faecium in Biofilm Formation, Adherence to Host Extracellular Matrix Components and Experimental Infection. ***Infection and Immunity*** . 22;84(5):1491-500 (**2016**). Impact Factor 3.7

2. **Yadav P,** Owiti N, Kim N . Transcription-linked orientation bias in RNA:DNA hybrid accumulation correlates with the orinetation bias in genome instability associated with a guanine rich sequence . ***Nucleic Acid Research***. 29:718-729 (**2016**). Impact Factor 9.1

3. Bhat R, Yadav P, Christiny P, Schiff R, and Trivedi MV. Novel G protein-coupled receptor targets in HER2+ breast cancer **.** ***Cancer Research.*** 75: 3573 (**2015**). Impact Factor 9.2

4. **Yadav P**, Harcy V, Arguesto J.L, Dominska M, Robertson S.J and Kim N. Topoisomerase I plays a critical role in suppressing genome instability at a highly transcribed g-quadruplex-forming sequences. ***Plos Genetics.*** 10(12); (**2014**). Impact Factor 9.5

5. Galloway-Peña J.R, Liang X, Singh K.V, **Yadav P**, Chang C, Rosa S.B.L, Shelburne S, Ton-That H, Höök M, Murray B.E. The Identification and Functional Characterization of WxL Proteins from *Enterococcus faecium* Reveal Surface Proteins Involved in Extracellular Matrix Binding. ***Journal of Bacteriology.*** (10):4004-16 (**2013**). Impact Factor 3.5

6. Johri AK, Lata H, **Yadav P**, Dua M, Yang Y, Xu X, Homma A, Barocchi MA, Bottomley MJ, Saul A, Klugman KP, Black S. Epidemiology of Group B Streptococcus in developing countries. ***Vaccine***.. 31 Suppl 4: D43-45. (**2013)** Impact Factor 3.5.

7. **Sharma P#**, Lata H, Araya DK, Kashyap AK, Pathak HK, Dua M, Ali A, Johri AK. Role of pili proteins in adherence and invasion of Streptococcus agalactiae to the lung and cervical epithelial cells***. Journal of Biological Chemistry***. 288(6):4023-34.(**2013**). Impact Factor 5.5..

8. MV Trivedi, R Bhat, V Yadav, **P Yadav,** A Al-Rawi, P Christiny, S Nanda, M Giuliano, C Creighton, CK Osborne, VA Narkar, and R Schiff. GPR110 overexpression increases tumorigenic potential of HER2+ breast cancer cells. ***Cancer Research***. 72 (24): supplement 3. (**2012**). Impact Factor 9.2.

9. **Yadav P**, Bhat RR, Chayanam S, Christiny PI, Nanda S, Creighton H Hu, C, Osborne CK, Schiff R, and Trivedi MV. Identification of novel G-protein coupled receptor targets in HER2-positive breast cancer. ***Cancer Research***. P4-06-02-P4-06-02. . (**2013**). Impact Factor 9.2.

10. Jiang S, Park S.E., **Yadav P**. Paoletti L, and Wessels M. Regulation and function of pilus island 1 in group B Streptococcus. ***Journal of bacteriology***. 2012. 194(10):2479-90. (**2011**). Impact Factor 3.2.

11. Moffitt K.L, **Yadav P**, Weinberger D.M., Anderson P.W. and Malley R. Broad antibody and T cell reactivity induced by a pneumococcal whole-cell vaccine***. Vaccine***. 30(29):4316-22. (**2012**) Impact Factor 3.5.

12. Lu Y, **Yadav P**, Clements J, Forte S, Srivastava A, Thompson C.M., Seid R., Alderson M., Tate A., Maisonneuve J., Roberston G,. Anderson P.W and Malley R. Options for inactivation, adjuvant, and route of topical administration of a killed unencapsulated pneumococcal cellular vaccine. ***Clinical vaccine Immunology***. 17(6):1005-12.(**2010**) Impact Factor 2.3.

13. Johri A.K., **Yadav P**, Ali A, Jaint H, Dua M and Mehta G. Epidemiology, Invasiveness and Comparative Proteomic Analysis of Group B Streptococcus (GBS) of Indian Origin***. International Journal of Infectious Diseases***. 12: e457-e458. (**2008**). Impact Factor 2.3.

14. Johri A.K., Paoletti L.C., Glaser P, Dua M, **Sharma P#**, Grandi G and Rappuoli R. Group B Streptococcus: Global Incidence and Vaccine Development***. Nature Review Microbiology***. 4: 932-942. (**2006**). Impact Factor 23.3.

Maiden Name: PUJA SHARMA

RESEARCH PLAN

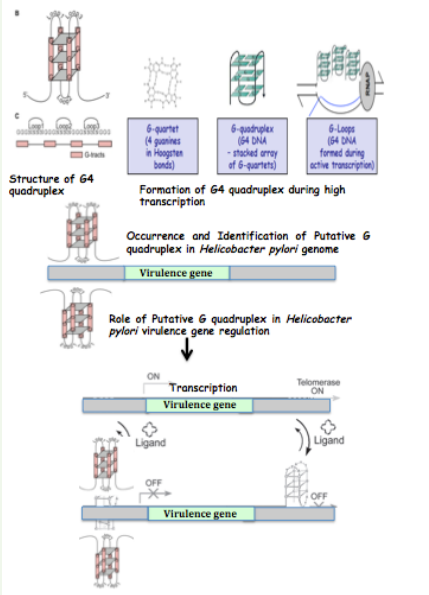
The **primary areas of research** in the laboratory are to explore the the following areas:

1. G4 DNA: A Novel Therapeutic Target in Microbes

Guanine-rich nucleic acid sequences or G4 DNA are capable of folding into an intramolecular four-stranded structure called a G-quadruplex. There are approximately 37,000 G4 motifs identified in the human genome and some of them have been implicated in recombination events that lead to cancer. Such G4 motifs in humans are most abundantly in telomere, immunoglobulin switch regions, poly (dG) runs, 5'-untranslated region (UTR), 3' UTR and promoter regions of several genes. Furthermore, G4 motifs are conserved in terms of their composition and location in human population implying that they play an important role in cellular process. Formation of G4 in the promoter of proto-oncogenes, oncogenes have been associated with repression of transcription i.e., RET, c-MYC, KIT, BCL2, KRAS and VEGF (tumor angiogenesis factor) resulting in altered protein expression.

Genome-wide analyses have identified numerous putative G4 DNA motifs (PG4) in bacteria. In *Escherichia coli*, G4 DNA was hypothesized to be a regulatory motif for global gene regulation and strand orientation and the exact position of a G-quadruplex sequence strongly influence its effect on transcription and translation of several genes. Genome-wide scans for the distribution of PG4 within bacterial genomes suggest that G4s are widely distributed and may actually have quite broad roles in the regulation of bacterial genes. G4s may therefore affect virulence processes in many more bacterial pathogens. Other microorganisms such as *N. gonorrhoeae* and *B. burgdorferi evade host immune system by pilin antigenic variation through combinational event that is initiated by G4 motif.*

Since G4 DNA is an important element in microbial diseases, **the long-term goal of our lab to understand the G4 DNA mediated genomic instability** in pathogenic bacteria that may lead to disease progression.



2. Molecular mechanism of host-microbe interaction

3. Rhizospheric biodiversity of medicinal plants

Ph.D. Students and trainees will exploit Bioinformatic, molecular and genetic techniques for the identification and functional characterization of G4 in microbes and further check their role in genomic rearrangement (**in collaboration with Prof. Nayun Kim, University of Texas, Houston, USA).** Students will also work on host-microbe interaction (**in collaboration with Dr. Yingjie Lu, Harvard Medical School, Boston, USA).** The trainees will gain experience in using genetic yeast model, cell culture, Signature tagged mutagenesis, CD Spectroscopy, metagneomics, proteomics, antibiotic screening in pathogens, biofilm formation and their regulation respectively