Dr. B.R. Ambedkar Center for Biomedical Research
University of Delhi
Delhi-110007

This is to inform the candidates who will be appearing for the interview in PhD Program in Biomedical Sciences (date to be announced soon), must prepare the SOP upto three slides. The research interests and related activities which are being carried out in the laboratory and the seats available for PhD registration with each faculty are given below. The candidate should identify the faculty with whom he/she would like to pursue PhD dissertation work.

Prof. Pratibha Mehta Luthra
ACBR

Research Area/ Interests

Research in my laboratory focuses on i) the study of the signaling pathways in brain to explore the nNOS mediated oxidative stress leading to neurodegeneration in brain for design and development of new neuro-protecting agents and ii) discovery of new chemical entities (NCE) in the therapy of Parkinson's disease (PD) through adenosine A2ARs. iii) The work also involves to explore the molecular pathways in the pathology of GBM, which may reveal multiple targets for the treatment of GBM to address drug resistance and provide specificity and selectivity in cancer chemotherapy.

The research tools in my laboratory include- Bioinformatics-ligand based and structure based drug design, virtual screening, protein structure prediction, synthesis of NCE and their isolation from plants, In vitro screening of NOS inhibitors using the mammalian expression clones of human eNOS, iNOS and nMOS expressed in HEK cell lines, and adenosine A2A receptor antagonists in stably transfected in SKNSH/ SHSY5Y or primary neuronal cells isolated from E18 rats / The anticancer activity of the compounds and their molecular mechanism (receptor, oxidative and cell cycle mediated) was studied in human glioma U87 cell line. The in vivo study with 6-OHDA induced Parkinson Model in rats.. The anticancer potential with xenograft invivo model of glioblastoma by injecting U87 MG cells in non-immune suppressed mice (subcutaneous and intracranial).

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Prof. MadhuChopra
ACBR

Drug Design and Development: The projects would involve working on Design of pharmaceutical agents against cancer and infection through computational design involving Machine Learning and/or Molecular mechanics based design, Virtual library screening, wet lab experimentation for bioevaluation and to study detailed mechanism of action of the developed drugs using in vitro and in vivo model systems.

Urmi Bajpai, PhD
Professor,
Department of Biomedical Science,
AcharyaNarendraDev College,
University of Delhi.
https://www.andcollege.du.ac.in/

Area of research

- Exploring anti-mycobacterial potential of mycobacteriophages and encoded Endolysins (Enzybiotics)

- Mur enzymes of the cell wall biosynthesis pathway of *Mycobacterium tuberculosis* as the target proteins for TB Drug Discovery & Drug Repurposing.

Dr. Sanjay Kumar Dey
Research area:
Our research group is characterizing ion-channels and other therapeutically important proteins to provide a strong base for translational research with outcome related to the treatment of SARS-CoV-2, and atherosclerosis. We do cloning, expression, and purifcation of recombinant viral or human proteins; cell culture, and biochemical as well as biophysical charaterization of such proteins *in vitro and ex vivo*.

Prof. K. Natarajan's
Prof. K. Natarajan's laboratory works on host-pathogen interactions during respiratory infections with a focus on mycobacterial infections. The lab focuses on delineating the cross-talk between innate receptors and signaling machinery that regulates defense responses from macrophages and dendritic cells. The current projects include roles by TLRs, CLRs, post-translational modifications and calcium homeostasis in mediating the above responses.

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Dr.Gagan Dhawan
Department of Biomedical Science
ANDC, University of Delhi
https://www.andcollege.du.ac.in/uploads/departments/BMS/GaganDhawan.pdf

Area of Research
Computational Biology and Drug Discovery

- Structure-guided design of potent and selective bromodomain inhibitors for the development of novel anticancer molecules.
- Prediction of accumulation of drug-like molecules in cancerous tissue on the basis of their structural features.
- Design, synthesis, characterization and biological evaluation of nano-structured biodegradable polymer-drug conjugates with inherent anticancer properties.

Prof. Manisha Yadav
Lab: Medical Microbiology and Immunology

To identify the host receptors and the host-pathogen pathways involved in the symptomatic and asymptomatic sequelae and immune evasion caused by Trichomoniasis, Sepsis and Urinary Tract Infections (UTI), specifically look into the inflammasomes, CRISPR/cas system and Biofilm formation.

Dr. Uma Dhawan
Associate Professor
Department of Biomedical Science
BCAS, University of Delhi
https://bcas.du.ac.in/academics/faculty/

Research Area: Genetics and Epigenetics of Neurodegenerative Diseases

1. Role of 5-hydroxymethylcytosine and RNA binding proteinsin neurodegeneration
2. Effect of environmental toxicants in pathogenesis of neurodegeneration
3. Proteogenomics data analysis for understanding different stages of progressive neurodegenerative disorders

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Dr. Meenakshi Sharma

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My lab research work focuses on Anti-microbial resistance (AMR) and its mechanism in different pathogenic micro-organism. We also try to search for new novel compounds to combat such AMR.

Prof. Laishram Singh

Research Area: Protein misfolding and human disease

Proper folding of proteins to their unique 3 dimensional structure is crucial to gain biological function. In general, defects in folding result in the formation of misfolded intermediates, which are either removed from the cells via enhanced degradation or end up by forming high order oligomers. Such high order oligomers are then deposited in the intracellular or extracellular compartments and become the bottleneck for the development of human diseases. Such folding defects may arise due to at least 3 reasons: mutation in the underlying gene, unwanted post-translational modifications and extreme environmental insults. Currently, our laboratory is engaged in identifying non toxic naturally occurring small molecule compounds and phytochemicals that can correct mutational defects or inhibit formation of toxic protein oligomers on 3 different pathogenic proteins namely, Abeta (that causes Alzheimer's), alpha-synuclein (that causes Parkinson's) and transthyretin (that causes familial polyneuropathy).

Certain pathologic conditions (e.g., homocystinuria or hyperglycemia, diabetes) are the basic cause of proteotoxicity because of unwanted post-translational modifications. We are also interested to understand the nature of proteotoxicity caused covalent modification of proteins by homocysteine (that accumulate under homocystinuric condition) and by advanced glycating end products (formed under hyperglycemic, diabetic condition) and the strategies to suppress the modifications.

Prof. ManishaTiwari

TITLE: Use of diallyl disulfide analogs for the treatment of COVID 19

Natural products are rich and unexplored sources of lead compounds with bioactive properties. One such compound present in garlic is diallyl disulfide which has been shown to be cardioprotective and neuroprotective. (A. Manral et al Bioorg.Med Chem. 23 (2015) 6389-6403)

The analogs have been further modified by incorporating two keto moieties into the core structure and using phenyl groups with methoxy and hydroxy substituents, such that the structure resembles that of curcumin. Curcumin is well known immune booster and we hypothesize that our compounds could be useful for the treatment of COVID 19

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Prof. Ajay Kumar Yadav
ACBR

Area of Research: The study is to understand the Trail Resistance Pathway in glioma disease progression

Main work is to experimentally understand the above mentioned pathway using different molecular techniques containing signal transduction pathway are as follows:-

- Molecular gene cloning,
- Real Time PCR,
- Mammalian Cell transfaction,
- SiRNA based Assays.

Dr. Kamna Srivastava

Area of research

1.Studying the regulatory function and signaling crosstalk mediated by small non coding RNAs such as miRNAs in coronary artery disease (CAD) and to develop these non-coding RNAs as therapeutic targets and potential biomarkers in cardiovascular diseases.

2. Study the role of Heat Shock Proteins gene polymorphisms, expression in whole blood and their correlation with plasma inflammatory markers in cardiovascular disorders.

3. Study the role of PCSK9 gene in Coronary Artery Diseases.

4. Evaluation of GDF-15 as a Novel circulating Biomarker in Myocardial Infarction.

Dr.Indu Arora

Research Interest

The area of interest includes synthesis and characterization of metallic and polymeric nanoparticles for their application in the treatment of Neurodegenerative diseases like Alzheimer, Brain ischemia and epilepsy. Our research group also engage in toxicological evaluation of metallic nanoparticle like silver, platinum, iron etc.

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Prof. UMA CHAUDHRY
Professor
Department of Biomedical Science
Bhaskaracharya College of Applied Science
University of Delhi

Prof. Uma Chaudhry, is currently working as a Professor in the Department of Biomedical Science of Bhaskaracharaya College of Applied Sciences, University of Delhi and is coordinating the NAAC related activities of the college. She has more than 17 years of teaching and research experience in the area of Biomedical Science and has worked as a Fellow in Life Sciences at Institute of Lifelong Learning, University of Delhi in the year 2009. Her research area mainly focuses on medical diagnostics, metagenomic analysis and antimicrobial stewardship. Three students have completed Ph. D. under her guidance in joint collaboration and currently two more students have registered and working with her. Her Ph.D. students have been successfully placed in research organizations. She has 22 research publications to her credit, both in national and inter-national journals of repute. She is an Inventor for two patents (National, 2005 and International, 2015) in joint collaboration and the group has been able to transfer their technology to industry. She has Research Projects from funding agencies, such as University Grants Commission, Indian Council of Medical Research, Department of Biotechnology and Department of Science and Technology, which has helped her students with their research work. Special mention is her completed DBT Foldscope project, wherein Department of Biotechnology has encouraged her to reach out innovative ideas to the aspirational districts and rural population.

Prof. Uma Chaudhry has received several awards and scholarships including Lady Tata Memorial Trust Scholarships. She is recipient of prestigious Summer Research Fellowship in the year 2014 by Indian National Science Academy and has been awarded by University Grants Commission a Research Award during the year 2016-18.

Ongoing Projects:

1. “ARMEd: Antimicrobial resistance mitigation and eradication using blended learning approach - social media, outreach and awareness activities.” Funding Agency: DST (2020-22)
2. “Exploring moonlight enzyme, glutamate racemase, of Neisseria gonorrhoeae as a target for anti-gonococcal drug discovery.” Funding Agency: ICMR (2019-22)