

CURRICULUM VITAE



Dr. Nitish Rai

Assistant Professor

Department of Biotechnology

Vigyan Bhawan - Block 'B'

Mohanlal Sukhadia University (Main Campus)

Udaipur - 313001 (Raj.)

Email: nits6691@gmail.com

nitish.rai@mlsu.ac.in

<https://scholar.google.co.in/citations?user=HlhBWZYAAAAJ&hl=en>

https://www.researchgate.net/profile/Nitish_Rai3

Fields of Research Interest

Alzheimer's disease and Parkinson's disease: Deciphering the basic biology of disease and biomarker study.

Aging biology: Mechanistic understanding of aging and its implication in health and diseases.

Abroad Experience

<i>Country Visited</i>	<i>Duration of Visit</i>	<i>Purpose of Visit</i>
United Kingdom	2017	Newton-Bhabha Research placement

Educational Degrees

Name of Exam	Board/ University	College/Institute	Subject	Percentage of marks
Doctoral Degree (Ph.D.)	All India Institute of Medical Science, New Delhi	All India Institute of Medical Science, New Delhi	Biophysics	-
MASTER'S DEGREE (MSc.)	Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh	Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India	Medical Biotechnology	68% (Institute Topper)
BACHELOR'S DEGREE (BSc.)	University of Delhi, Delhi	Swami Shradhanand College, Delhi, India	Microbiology (Hons.)	74% (College Topper)

Research Experience

Analysis and plausible role of serum sestrin level in Parkinson's disease and Alzheimer's disease and its therapeutic implication.

During my doctoral work, I asked the fundamental question of causative role of oxidative stress in neurodegeneration and counteracting action of antioxidant systems in body. In my quest, I tried to develop protein marker for the diagnosis of two most predominant causes of dementia- Alzheimer's disease & Parkinson disease. I studied the action of one of the most important antioxidant protein- sestrin in the patients affected from Alzheimer's disease & Parkinson disease to establish it as diagnostic marker. I interrogated the functional significance of sestrin in disease physiology using neuronal cell line induced with toxic molecules to model pathological hallmark of the disease.

Differentiation of Patient-derived induced pluripotent stem cells (iPSCs) to cortical and dopaminergic neurons to study the role of sestrin2 in Parkinson's disease and Alzheimer's disease.

At Manchester Metropolitan University, I studied the role of antioxidant protein sestrins using induced pluripotent stem cells (iPSCs)-derived Neural Stem Cells (NSCs) disease model to get better insights of their function under pathophysiological condition of Alzheimer's disease. The induced pluripotent stem cells (iPSC) are pluripotent cell lines derived from the reprogramming of adult human cell into embryonic stem cells which have the capacity to differentiate into defined cell lineage. These iPSC were derived from human patients affected from Alzheimer's disease and thus possess similar genetic aberration and

complications as patients.

Design of strategy for point of care detection of melamine from human urine.

I developed a method for point of care detection of melamine, a hazardous food adulterant, from human urine. I studied the complex forming property of melamine with barbituric acid and cyanuric acid using fluorescence spectrometry.

Study of mouse Phf11 and Batf2 proteins in E. Coli BL21 cells.

In this work I learnt to make clones and express the proteins to generate the antibodies in animals. I cloned Interferon gamma inducible genes to understand their function in a better way.

Selected Publications

1. Nitish Rai, G Venugopalan, Rashmita Pradhan, Akash Ambastha, Upadhyay Ashish Datt, Sadanand Dwivedi, Aparajit B. Dey, Sharmistha Dey. Exploration of Novel Anti-Oxidant Protein Sestrin in Frailty Syndrome in Elderly. *Aging Dis.* 2018.
2. Shashank Shekhar, Saroj Kumar Yadav, Nitish Rai, Rahul Kumar, Yudhishtir Yadav, Manjari Tripathi, Aparajit B. Dey, Sharmistha Dey. 5-LOX in Alzheimer's Disease: Potential Serum Marker and In Vitro Evidences for Rescue of Neurotoxicity by Its Inhibitor YWCS. *Mol Neurobiol.* 2018.
3. Nitish Rai (Corresponding Author) and Dibyajyoti Banerjee. Melamine adulteration of food: detection by point-of-care testing tool. *Current Science.* 2017. 112.
4. Nitish Rai, Rahul Kumar, Md Anzarul Haque, Md Imtaiyaz Hassan, Sharmistha Dey. A Study of Recombinant Human Sestrin 1 and Sestrin 2 Proteins Produced in a Prokaryotic System. *Molecular Biology (Mosk.)* 2017. 51:473-482.
5. Rashmita Pradhan, Rahul Kumar, Shashank Shekhar, Nitish Rai, Aakash Ambastha, Joyita Banerjee, Mona Pathak, Sadanand Dwivedi, Sharmistha Dey, Aparajit B. Dey. Longevity and healthy ageing genes FOXO3A and SIRT3: Serum protein marker and new roadmap to burst oxidative stress by *Withania somnifera*. *Exp Gerontol.* 2017. 95:9-15.
6. Nitish Rai, Rahul Kumar, Gaurav Rajesh Desai, G. Venugopalan, Shashank Shekhar, Prasun Chatterjee, Manjari Tripathi, Ashish Datt Upadhyay, Sadanand Dwivedi, Aparajit B. Dey, Sharmistha Dey. Relative alterations in Blood-Based Levels of sestrin in Alzheimer's Disease and Mild Cognitive Impairment Patients. *Journal of Alzheimer's disease.* 2016. 54:1147-1155.
7. Shashank Shekhar, Rahul Kumar, Nitish Rai (Co-first author), Vijay Kumar, Kusum Singh, Ashish Datt Upadhyay, Manjari Tripathi, Sadanand Dwivedi, Aparajit B. Dey and Sharmistha Dey. Estimation of Tau and Phosphorylated Tau 181 in serum of Alzheimer's disease and Mild cognitive impairment patients. *PloS One.* 2016. 11:e0159099.
8. Rahul Kumar, Abhay Kumar Singh, Manoj Kumar, Shashank Shekhar, Nitish Rai, Punit Kaur, Rajinder Parshad and Sharmistha Dey. Serum 5-LOX: A progressive protein marker for breast cancer and new approach for therapeutic target. *Carcinogenesis.* 2016. 37:912-7.
9. Nitish Rai, Dibyajyoti Banerjee, Rajasri Bhattacharyya. Urinary melamine: Proposed parameter of melamine adulteration of food. *Nutrition.* 2014. 30:380-385.

Book Chapter

Sharmistha Dey, **Nitish Rai**, Shashank Shekhar, Amrendra Pratap Singh, Vertica Agnihotri. (2019) Molecular Marker and Therapeutic Regimen for Neurodegenerative Diseases Models, In: *Molecules and Mechanisms in Biogerontology*, (ed) Pramod C. Rath, ISBN 978-981-13-3584-6, Springer, Singapore.

Selected Conference Papers

<i>S. No</i>	<i>Author(s)</i>	<i>Year</i>	<i>Title</i>	<i>Name and Place of Conference</i>
1.	Nitish Rai , A.B. Dey, Sharmistha Dey	2019	Novel Antioxidant Molecules in the pathophysiology of Alzheimer's disease: Diagnostic and Therapeutic Prospects.	19th Biennial Conference of AGI, New Delhi.
2.	Nitish Rai , A.B. Dey, Sharmistha Dey	2019	Identification of elevated levels of sestrin in early MCI and Alzheimer's disease: An opportunity for a potential marker.	IBRO-APRC Associate school of Neuroscience
3.	Nitish Rai , Amrendra Pratap Singh, Shashank Shekhar, Yudhishthir Yadav, A.B. Dey, Sharmistha Dey.	2017	Sestrin levels in patients diagnosed with Mild Cognitive Impairment and Alzheimer's disease: A potential marker.	Alzheimer's Association International Conference® (AAIC®), 2017. London, UK.
4.	Nitish Rai , Shashank Shekhar, Amrendra Pratap Singh, A. B. Dey and Sharmistha	2016	Relative Alterations in Blood-Based Levels of Sestrin in Alzheimer's Disease and Mild Cognitive Impairment Patients.	18 th Biennial Conference of AGI and 14th Annual conference of Indian Academy of Geriatrics as Indian Ageing Congress
5.	Nitish Rai , Shashank Shekhar, Vijay Kumar, Manjari Tripathi, A.B. Dey and Sharmistha Dey	2015	Serum SIRT1 protein as a plausible marker for early detection of Alzheimer's Disease.	International Congress on Gerontology And Geriatric Medicine 2015, New Delhi, India
6.	Sharmistha Dey, Nitish Rai , Amrendra Pratap Singh, Shashank Shekhar, Aparajit B. Dey	2017	Evaluation of Serum Sestrin protein in Parkinson's disease: a plausible diagnostic marker	International Congress Of Parkinson's Disease And Movement Disorders, Vancouver, BC.
7.	Sharmistha Dey, Amrendra Pratap Singh, Nitish Rai , Shashank Shekhar,	2017	Serum Sirtuins as Novel Protein Markers for Frailty	International Association of Gerontology and Geriatrics (<i>IAGG</i>) World Congress, San Francisco,

Selected Awards /Recognitions & Fellowships

<i>S.No</i>	<i>Award Name</i>	<i>Awarding Organization</i>	<i>Awarded Work /Project</i>
1.	First Prize (Gold medal)	Gericon 2017, 15th annual conference of Indian academy of geriatrix.	Oral Presentation
2.	Newton-Bhabha PhD placement award	Department of Science and Technology, India and British Council, UK	Research Internship
3.	AV Tilak Prize (Biogerontology)	Association Of Gerontology and Indian Academy of Geriatrics, India.	Oral Presentation
4.	Award	3rd International congress on Gerontology and Geriatric medicine (ICGGM) 2015	Oral Presentation
5.	Award	ACBICON- 40th National Conference of Association of Clinical Biochemists of India, 2013, New Delhi, India.	Poster Presentation
6.	Third Prize	Vigilance awareness week, 2012 at PGIMER, Chandigarh.	Declamation contest
Fellowships			
1.	Innovation in Science Pursuit for Inspired Research (INSPIRE)- Junior Research Fellowship	Department of Science and Technology, Government of India.	Research
2.	NET- Junior Research Fellowship	Council of Scientific and Industrial Research (CSIR) – University grant commission Government of India.	Research
3.	NET- Junior Research Fellowship	Indian Council of Medical Research (ICMR), Government of India.	Research
4.	Qualified with an All India Rank of 225 (98.25 percentile).	Graduate Aptitude Test in Engineering (Life Science) 2013, Government of India	Research
5.	Summer Research Fellowship (SRF).	Indian Academy of Sciences.	Research

Membership of Professional Societies / Institutions

Name of the Professional Institute / Society	Type of Membership
International Parkinson and Movement Disorder Society (MDS), USA.	Lifetime member
Member of the Indian Science Congress Association, Kolkata, India.	Lifetime Member
Member of the Association of Gerontology (AGI), India.	Lifetime Member
Member of Society of Young Scientist (SYS) AIIMS, New Delhi, India.	Lifetime Member