

Biographical Sketch

USHA RAJAMMA, PhD

Senior Scientist & Head

Centre for Development & Aging Research

Inter University Centre for Biomedical Research & Super Speciality Hospital (IUCBR & SSH)

MGU Campus, Thalappady, Rubber Board P.O., Kottayam, Kerala, PIN: 686009

Personal information:

E-mail: ushamvk@yahoo.co.in

Date of Birth: 21st May 1962

Education & Research Training:

Institution/Location	Degree / Division	Year	Field of Specialization
Assumption College, University of Kerala, India	B.Sc. / I	1982	Botany (Main), Chem & Zool (Subs)
Fatima Mata National College, University of Kerala, India	M.Sc. / I	1984	Botany
Indian Institute of Chemical Biology (IICB), Jadavpur University, Kolkata, India	Ph.D.	1993	Science (Biochemistry)

Postdoctoral Research Experience: 7 years

CSIR-Indian Institute of Chemical Biology, Kolkata, India	Research Associate [CSIR-DBT-TAB]	Oct 1994 - Mar 1997	Protein Engineering
CSIR-Indian Institute of Chemical Biology, Kolkata, India	CSIR - Research Associate	Apr 1997 - Oct 1999	Protein Engineering
CSIR-Indian Institute of Chemical Biology, Kolkata, India	CSIR - SRA (Sct. Pool Scheme)	Dec 1999 - Dec 2001	Molecular Biology

TAB: Technology Advisory Board

Professional Experience: 15 years

Manovikas Kendra Rehabilitation & Research Institute for the Handicapped, Kolkata, India	Scientist	Dec 2001-Jan 2017	Genetics and Neurochemistry of ASD & Molecular Neurobiology of HD
IUCBR & SSH, Kottayam, Kerala	Senior Scientist	Jan 2017-till date	Neurobiology of Developmental Disabilities

ASD: Autism spectrum disorders; HD: Huntington's disease

Appointments Received (*but Not Accepted Due to Family Commitments*):

Rajiv Gandhi Centre for Biotechnology	Scientist-C	2000	DBT, Govt. of India
Institute for Communicative and Cognitive Neurosciences (ICCONS)	Senior Scientist	2009	Govt. of Kerala

Professional information:

Area of Research: Genetics, Neuroscience, Protein Chemistry, Molecular Biology

Mentoring Experience:

- Number of total Ph. D students: 07
- PhD awarded: 04
- Registered for Ph.D. program: 03
- Number of summer students (M.Sc./M.Tech): 14
- Number of DBT-PDF mentored: 02

Teaching Assignments

- Teaching B.Ed. (Special Education) students, a collaborative program of Jadavpur University at Manovikas Kendra, from April 2015 onwards
- Guest lecturer in Department of Biotechnology & Department of Genetics, University of Calcutta, Kolkata 2003-2004.
- Guest lecturer in Department of Biotechnology & Department of Genetics, University of Calcutta, Kolkata 2003-2004.

Honors and Awards

- Prof. N.J. Thomas Prize for securing highest mark in MSc (Botany) from Fatima Mata National College, Kerala, India in the year 1984.
- Qualified the National Eligibility Test (NET) by CSIR, Govt. of India, in 1985.
- Received B.S. Narasinga Rao Best Poster prize at the 66th Annual Meeting of Society of Biological Chemists (India) in 1997.
- Awarded Research Associateship of CSIR, Govt. of India, in 1997.
- Selected as Senior Research Associate under Scientist Pool Scheme of CSIR, Govt. of India
- Awarded SERC Fast track proposal scheme for Young Scientists by Department of Science & Technology, Govt. of India – 2001.

Financial support received for International Travels

- Received partial travel support for registration from Centre for International Co-operation in science (CICS-promoted by INSA) to attend Asia-Pacific Society for Neurochemistry (APSN) meeting in 2014 at Taiwan
- Received travel award from Department of Science & Technology (DST), Govt. of India to attend Asia-Pacific Society for Neurochemistry (APSN) meeting in 2014 at Taiwan
- Recipient of Committee for Aid in Education in Neurochemistry (CAEN) Travel award for attending the Society for Neurosciences (SfN) meeting held in Washington DC -2011.
- Received travel grant from Indian Council of Medical Research (ICMR) to attend Society for Neurochemistry (SfN) meeting in 2011 at Washington DC.
- Received the travel award for professionals from developing countries by International Society for Autism Research (INSAR), USA to participate in the International Meeting for Autism Research (IMFAR 2010) in 2010
- Received travel award from Department of Science & Technology (DST), Govt. of India to attend Society for Neurochemistry (SFN) meeting in 2010 at San Diego, USA

Professional Activities (Internal)

- Standardization of PCR-based, and special neurochemical diagnostic procedures - Conduct and report on clinical diagnostic assays of PW-AS and Rett syndromes; neurotransmitter profiling in certain ASD and other neurodevelopmental disorders; etc.
- Administrative responsibilities of the institute: preparing the documents for application for SIRO recognition/registration and the renewal; Institute's recognition by the Calcutta University, managing the research projects – recruitment of project staff, ordering chemicals/consumables/capital goods, keeping of the accounts, sending out research reports, projects etc.
- Teaching PCR based diagnostic methods at the regular Workshops organised at Manovikas Kendra, Kolkata for the last 4 years.
- Part of the team to publish a book on 10 years research activities of Manovikas Kendra by compiling the research activities.
- Standardised the diagnostic methods for PWS/AS and Rett syndrome.

Professional Activities (External)

- PhD Examiner; The Tamil Nadu Dr. M. G. R. Medical University, Chennai (Twice)
- Peer Reviewer of manuscripts for the following journals:
 - Pharmacology Biochemistry Behavior, BMC Med Genetics, Eur J Human Genet, J Neurosci Res, J Cell Tissue Res, Res Autism Spectrum Disorders, Psychiatric Investigation, Autism Research,
- Grant reviewer:
 - (i) Department of Biotechnology, Govt. of India, (ii) Telethon, Italy

- Visited the Department of Human Development at Cornell University at Ithaca and given a talk at the Laboratory of Prof. Matthew Belmonte.
- Reviewer for ranking research papers submitted for presentation in the Annual Meeting of Kerala Science Congress held in February 2014.

Professional extracurricular functions:

- Chair person of one of the sessions in Neurocon 2015 meeting held at Haldia, West Bengal
- Member of the rapid fire session on Lipids in Neurodegeneration and Neuroprotection in Neurocon 2015 meeting held at Haldia, West Bengal
- As resource person in panel discussion in Neurocon 2015 meeting held at Haldia, West Bengal
- Scientific Committee member, Neurocon 2015
- Convenor & Chairperson of the symposium on Developmental Neurobiology in the IAN-2014 meeting held at NIMHANS, Bangalore
- Chairperson of the session on Paediatric Neurology in NeuroUpdate-2014 meeting held at CSIR-IICB, Kolkata
- Assistant Organizing Secretary, Kolkata Neuroscience Conference – 2014 ('Neurochemistry of Ageing Brain' – Jan 31-Feb 1, 2014; CSIR-IICB, Kolkata).
- Member, Organising Committee of APSN-ISN Neuroscience School 2014 held at CSIR-IICB, 27th to 31st January 2014.
- Chaired one session & acted as member of the panel discussion, Neurocon-2013, CSIR-IICB, Kolkata
- Secretary & Finance Officer/Treasurer of Neurocon-2013, Kolkata
- Secretary-in-Charge, Finance & Sponsorship, Neurocon-2011 held at IPGME&R, Kolkata
- Member, Organising Committee, 'Frontiers in Neuroscience & Genetics' Manovikas Kendra Kolkata - 23rd Dec 2011
- Faculty of IBRO Workshop for the Asia-Pacific Regional Countries (APRC) - Dec 29, 2008 to Jan 8, 2009 at IICB, Kolkata.
- WWN-IBRO Needs Assessment Workshop for Women in Neuroscience: Centre for Neurosciences, Bangalore - 28th November 2009
- Scientific Committee Member, Neurocon-2009 held at IPGME&R, Kolkata
- Organizing committee Member NeuroUpdate, Kolkata – 2008, Sept 20-21, 2008 at CGCRI, Kolkata.

Peer-reviewed Publications: 36

Google Scholar Citation indices	All	Since 2012
Citations	624	425
h-index	15	13
i10-index	20	16

Peer-reviewed publications during the last five years

1. Verma P, Singh A, Nthenge-Ngumbau DN, **Rajamma U**, Sinha S, Mukhopadhyay K, Mohanakumar KP (2016) Attention deficit-hyperactivity disorder suffers from mitochondrial dysfunction. *BBA Clinical*. 6: 153-158
2. Chakraborti B, Verma D, Karmakar A, Jaiswal P, Sanyal A, Paul D, Sinha S, Singh AS, Guhathakurta S, Roychowdhury A, Panda CK, Ghosh S, Mohanakumar KP, Mukhophadhyay K, **Rajamma U** (2016) Genetic variants of MAOB affect serotonin level and specific behavioral attributes to increase autism spectrum disorder (ASD) susceptibility in males. *Prog Neuropsychopharmacol Biol Psychiatry*. 71:123-36.
3. Karmakar A, Maitra S, Chakraborti B, Verma D, Sinha S, Mohanakumar KP, **Rajamma U**, Mukhopadhyay K. (2016) Monoamine oxidase B gene variants associated with attention deficit hyperactivity disorder in the Indo-Caucasoid population from West Bengal. *BMC Genet*. 17:92.
4. Chakraborty J, **Rajamma U**, Jana N, Mohanakumar KP (2015) Quercetin improves the activity of the ubiquitin-proteasomal system in 150Q mutated huntingtin-expressing cells but exerts detrimental effects on neuronal survivability. *J Neurosci Res*. 93:1581-1591.
5. Jaiswal P, Mohanakumar KP, **Rajamma U**. (2015) Serotonin mediated immunoregulation and neural functions: Complicity in the aetiology of autism spectrum disorders. *Neurosci. Biobehav. Rev*. 55:413-431.

6. Jaiswal P, Guhathakurta S, Singh AS, Verma D, Pandey M, Varghese M, Sinha S, Ghosh S, Mohanakumar KP, **Rajamma U**. (2015) SLC6A4 markers modulate platelet 5-HT level and specific behaviors of autism: a study from an Indian population. *Prog Neuropsychopharmacol Biol Psychiatry*. 56: 196-206.
7. Chakraborty J, Pandey M, Navneet AK, Appukuttan TA, Varghese M, Sreetama SC, **Rajamma U**, Mohanakumar KP. (2014) Profilin-2 increased expression and its altered interaction with β -actin in the striatum of 3-nitropropionic acid-induced Huntington's disease in rats. *Neuroscience*. 281C: 216-228.
8. Saha T, Dutta S, **Rajamma U**, Sinha S, Mukhopadhyay K. (2014) A pilot study on the contribution of folate gene variants in the cognitive function of ADHD probands. *Neurochem Res*. 39: 2058-2067.
9. Chakraborty J, Nthenge-Ngumbau DN, **Rajamma U**, Mohanakumar KP. (2014) Melatonin protects against behavioural dysfunctions and dendritic spine damage in 3-nitropropionic acid-induced rat model of Huntington's disease. *Behav Brain Res*. 264: 91-104.
10. Karmakar A, Maitra S, Verma D, Chakraborti B, Goswami R, Ghosh P, Sinha S, Mohanakumar KP, **Usha R**, Mukhopadhyay K. (2014) Potential contribution of monoamine oxidase a gene variants in ADHD and behavioral co-morbidities: scenario in eastern Indian probands. *Neurochem Res*. 39: 843-852.
11. Chakraborty J, **Rajamma U**, Mohanakumar KP. (2014) A mitochondrial basis for Huntington's disease: therapeutic prospects. *Mol Cell Biochem*. 389: 277-291.
12. Verma D, Chakraborti B, Karmakar A, Bandyopadhyay T, Singh AS, Sinha S, Chatterjee A, Ghosh S, Mohanakumar KP, Mukhopadhyay K, **Rajamma U**. (2013) Sexual dimorphic effect in the genetic association of MAOA markers with autism spectrum disorder. *Prog Neuropsychopharmacol Biol Psychiatr*. 50C: 11-20.
13. Chakraborty J, Singh R, Dutta D, Naskar A, **Rajamma U**, Mohanakumar KP. (2014) Quercetin Improves Behavioral Deficiencies, Restores Astrocytes and Microglia, and Reduces Serotonin Metabolism in 3-Nitropropionic Acid-Induced Rat Model of Huntington's Disease. *CNS Neurosci Ther.*; 20: 10-19.
14. Singh AS, Chandra R, Guhathakurta S, Sinha S, Chatterjee A, Ahmed S, Ghosh S, **Rajamma U**. (2013) Genetic association and gene-gene interaction analyses suggest likely involvement of *ITGB3* and *TPH2* with autism spectrum disorder (ASD) in the Indian population. *Prog Neuropsychopharmacol Biol Psychiatry*. 2013; 45: 131-143.
15. Karuppagounder SS, Madathil SK, Pandey M, Haobam R, **Rajamma U**, Mohanakumar KP. (2013) Quercetin up-regulates mitochondrial complex-I activity to protect against programmed cell death in rotenone model of Parkinson's disease in rats. *Neuroscience*. 236:136-148.
16. Madathil KS, Karuppagounder SS, Haobam R, Varghese M, **Rajamma U**, Mohanakumar KP. (2013) Nitric oxide synthase inhibitors protect against rotenone-induced, oxidative stress mediated parkinsonism in rats. *Neurochem Int*. 62:674-683.
17. Choudhury PR, Lahiri S, **Rajamma U**. (2012) Glutamate mediated signaling in the pathophysiology of autism spectrum disorders. *Pharmacol Biochem Behav*. 100:841-849.
18. Dutta S, Shaw J, Chatterjee A, Sarkar K, **Usha R**, Chatterjee A, Sinha S, Mukhopadhyay K. (2011) Importance of gene variants and co-factors of folate metabolic pathway in the etiology of idiopathic intellectual disability. *Nutr Neurosci*. 14:202-209.
19. Dutta S, Gangopadhyay PK, Sinha S, Chatterjee A, Ghosh S, **Rajamma U**. (2011) An association analysis of reelin gene (RELN) polymorphisms with childhood epilepsy in eastern Indian population from West Bengal. *Cell Mol Neurobiol*. 31:45-56.

Publications in peer reviewed, non-indexed journals: 6

Book chapters: 2

Invited Talks Delivered: 9

Research supports from Govt. of India agencies

A. Ongoing Projects (2+2)

- | | |
|-----------------------|---|
| 1. Funding agency: | Indian Council of Medical Research (ICMR), Govt. of India |
| Role: | Principal-Investigator |
| Amount Sanctioned: | Rs. 27.7 Lakhs |
| Period: | 3 Years, Feb 2015 – Jan 2018 |
| Title of the project: | Association of Monoamine Transporter Genes with Autism: Special Reference to Equilibrative Nucleoside Transporter 4 (ENT4 or SLC29A4) and Vesicular Monoamine Transporter-2 (VMAT-2 or SLC18A2) genes |

1. Funding agency: Indian Council of Medical Research (ICMR), Govt. of India
Role: Principal-Investigator (2)
Amount Sanctioned: Rs. 57 Lakhs
Period: 3 Years, Feb 2015 - Jan 2018
Title of the project: Exploratory investigation on the role of folate system in childhood onset neurodevelopmental disorders.

Individual Mentor-based Graduate Students Fellowship Grants: 2

B. Completed Projects (6+10)

1. Funding agency: Department of Biotechnology (DBT), Govt. of India
Role: Principal Investigator (2)
Amount Sanctioned: Rs. 76.82 Lakhs
Period: May 2012 – Nov 2015
Title of the project: Analysis of OPRM1 and DAT1 as possible candidate genes for drug addiction: A population based association study in the Indian population from Manipur.

2. Funding agency: Department of Biotechnology (DBT), Govt. of India
Role: Principal-Investigator (3)
Amount Sanctioned: Rs. 71.12 Lakhs
Period: Dec 2011 – Nov 2014 (3 Years)
Title of the project: Mitochondrial involvement in the pathophysiology of neurodevelopmental disorders, ADHD and ASD

3. Funding agency: Department of Biotechnology (DBT), Govt. of India
Role: Co-Investigator
Period: May 2008 – May 2010
Title of the project: Screening for mental retardation (MR) and investigation on the role of folate metabolism system gene polymorphisms in the etiology of MR

4. Funding agency: Department of Biotechnology (DBT), Govt. of India
Role: Co-Investigator
Period: June'04 - May'07
Title of the project: Mental retardation: awareness generation among rural women, screening for early detection and genetic counseling

5. Funding agency: Department of Science & Technology (DST), Govt. of India
Role: Principal Investigator
Amount: Rs. 7.8 Lakhs
Period: Feb'03 - Feb'06
Title of the project: Regulation of apoptosis in 3-nitropropionic acid induced rat model of Huntington's disease to define molecular pathways involved in striatal neurodegeneration

6. Funding agency: Council of Scientific and Industrial Research (CSIR), Govt. of India
Role: Principal Investigator
Amount: Rs. 15.6 lakhs
Period: Aug'03-July'06
Title of the project: Polymorphisms in reelin and serotonin transporter loci: A genetic correlation with autism

Individual Mentor-based Graduate/Postgraduate Students Fellowship Projects: 10

I certify that the information provided above are correct and true to the best of my knowledge and understanding.

26th January 2017
Kolkata

(Usha Rajamma)