Dr. Subhadip Paul

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RESEARCH INTERESTS: Computational Neuroscience/ Computational Brain-Imaging

1. Investigation of the organization principles of the structural and functional networks of the human brain in health and diseases using computational modeling of large-scale brain-imaging signals.

2. Development of multi-modal brain-imaging data analysis methods/tools for diagnosis of brain diseases.

3. Understanding the genetic signatures underlying structural and functional phenotypes of the human brain.

4. How the the structural and functional brain network organization are related to human behaviors?

RESEARCH EXPERIENCES/ WORK EXPERIENCES

Assistant Professor
School of Biological Sciences/ Department of Sports Sciences/
Scientist, JIVAN – Centre for Biological Sciences
Ramakrishna Mission Vivekananda Education and Research Institute (RKMVERI)
P.O. Belur Math, West Bengal, India
2021- Current

Post-doctoral Fellow
The Mind Research Network (Formerly MIND Institute), USA
2019 – 2021

Newton International Fellow (Post-doctoral)
Institute of Psychiatry, Psychology & Neuroscience
King's College London, United Kingdom.
2016 – 2018.

Research Fellow (Post-PhD)
National Neuroimaging Facility, National Brain Research Centre (NBRC),
Manesar, Gurgaon, India.
2015- 2016

Visiting Research Fellow (Pre-Ph.D)
7 Tesla MRI Team, Image Sciences Institute,
University Medical Centre, Utrecht University,
The Netherlands 2008- 2009

Research Fellow (Pre-Ph.D)
Department of Biomedical Engineering, University of Modena and Reggio Emilia,
Modena, Italy
2007- 2008

EDUCATION

Ph.D (Computational Neuroscience) 2015
National Brain Research Centre (Department of Biotechnology Institute, Govt. of India), Gurgaon, India

*Thesis Title***:** Higher order Diffusion Tensor Imaging and Stochastic Perturbation Response in Brain Tumour.
Thesis Advisor: Professor Prasun K. Roy (Now at IIT-BHU, Varanasi, India)

M.Sc in Physics (Specialization: *Biophysics*):
Department of Physics, University of Pune, Pune, India

Bachelor of Science (Honours in Physics):
Scottish Church College, University of Calcutta, Calcutta, India

Higher Secondary Examination (10+2 / XII):
West Bengal Council of Higher Secondary Education, West Bengal, India

Secondary Examination (10 / X):
West Bengal Board of Secondary Education, West Bengal, India

RESEARCH FUNDING / GRANT

Principal Investigator/ Award holder: **Dr. Subhadip Paul**

Awarded GBP 99,000 (approximately Rs. 99.12 lakh) by the **Newton Fund (UK)** and the **Academy of Medical Sciences (UK)** for the study of "Investigating the role of altered brain network dynamics and connectivity in Schizophrenia" (2016 – 2018). **Co- PI:** Prof. Sagnik Bhattacharyya, King's College London, UK.

FELLOWSHIPS / AWARDS / HONOURS/ SCHOLARSHIPS

1. **Newton International Fellowship** from the **Newton Fund (UK)** and **the Academy of Medical Sciences (UK)** to perform post-doctoral research at King's College London (2016-2018) (selected).

2. **Research Fellowship** from the **Ministry of University Studies and Research (Republic of Italy)** to perform research for one year at University of Modena, Italy (2007-2008) (selected).

3. **Research Fellowship** from the **Utrecht University (The Netherlands)** to perform research at Image Sciences Institute, University Medical Centre, Utrecht University, The Netherlands (2008) (selected).

4. One of the publications (Subhadip Paul et al, J. Neural Engineering 2019) was selected as **one of the featured articles in the journal during 2018-2019**.

5. **Travel Grant** from the **International Brain Research Organization (IBRO)** and **the Society for Neuroscience (SFN)** to present at Society for Neuroscience annual meeting (2014) (selected).

6. **Travel Award** from the Scholarship Committee, Stochastic Resonance 2008, **University of Perugia, Italy** (2008) (selected).

7. **International travel grant** from **Department of Biotechnology, Government of India** to present at Society for Neuroscience annual meeting (2012) (selected)

8. **National Scholarship** from **Ministry of Human Resource Development (MHRD)**, Government of India for **securing rank** in the state Secondary Examination (1996-1998) (selected).

9. **Certificate of appreciation** from the District Council, **Government of West Bengal** for securing rank in the district in Secondary Examination (1996) (selected).

10. Received **National Scholarship** at the Secondary stage based on merit in National Scholarship Examination of **Government of West Bengal, India** (1993-1996) (selected).

INTERNATIONAL PATENTS

Prasun K. Roy, **Subhadip Paul**. Technique to enhance the clinical efficiency of radiotherapy and radiosurgery using perturbative beaming and tissue-specific radiobiology.

1. **U.S. Patent:** US8804906 B2 **(Status: patent granted/issued)**

2. Canadian Patent: CA2778337C **(Status: patent granted/issued)**

INTERNATIONAL PUBLICATIONS (Refereed)

1. Subhadip Paul, Arora A, Midha R, Vu D, Roy PK, Belmonte MK. Autistic traits and individual brain differences: Functional network efficiency reflects attentional and social impairments, structural nodal efficiencies index systemising and theory-of-mind skills. *Molecular Autism*, 12 (1) 2021.

2. Subhadip Paul, S**.** Bhattacharyya. Cannabis use related working memory deficit is mediated by lower left hippocampus volume. *Addiction Biology*, 26 (4) 2021, e12984.

3. Vikas Pareek, **Subhadip Paul**, Prasun Kumar Roy. Corpus callosum remodeling in glioma: constancy of fiber density and anisotropy in MRI. *Canadian Journal of Neurological Sciences*, 1-5 2021.

4. Velayudhan L, Francis S, Dury R, **Subhadip Paul**, Bestwn S, Gowland P, Bhattacharyya S. Hippocampal functional connectivity in Alzheimer's disease: a resting state 7T fMRI study. *International Psychogeriatrics*, 33 (1) 95-96, 2021.

5. Subhadip Paul, Satyam Mukherjee, Sagnik, Bhattacharyya. Network organization of co-opetitive genetic influences on morphologies of the human cerebral cortex. *Journal of Neural Engineering*, 16 (2) 026028-38 2019. (**Selected as one of the featured articles published in this journal during 2018-19**)

6. J. M Maurer, **Subhadip Paul**, Nathaniel Anderson, P. Nyalakanti, Kent A. Kiehl. Youth with elevated psychopathic traits exhibit structural integrity deficits in the uncinate fasciculus. *Neuroimage: Clinical*, 26 102236, 2020.

7. Subhadip Paul, Sagnik Bhattacharyya. Does thinner right entorhinal cortex underlie genetic liability to cannabis use? *Psychological Medicine*, 48 (16) 2766-2775, 2018.

8. V. Pareek, **Subhadip Paul**, V. P. S. Rallabandi, Prasun K. Roy. Patterning of corpus callosum integrity in glioma observed by MRI: effect of 2D bi-axial lamellar brain architecture. *Journal of Neuro-Oncology* (144) 1, 165-177 2019.

9. Otte WM, van Diessen E, **Subhadip Paul**, Ramaswamy R, Subramanyam RVP, Stam CJ, Roy Prasun Kumar. Aging alterations in whole-brain networks during adulthood mapped with the minimum spanning tree indices: the interplay of density, connectivity cost and life-time trajectory. *Neuroimage*, 109 (1) 171-189, 2015.

10. Subhadip Paul, Prasun Kumar Roy. Strategy for stochastic dose-rate induced enhanced elimination of malignant tumour without dose escalation. *Mathematical Medicine and Biology*, 33(3) 319-328, 2016.

11. Subhadip Paul, Prasun Kumar Roy. The consequence of day-to-day stochastic dose deviation from the planned dose in fractionated radiation therapy. *Mathematical Biosciences & Engineering*, 13(1) 159-170, 2016.

12. Subhadip Paul, Prasun Kumar Roy. The effect of stochastic fluctuation in radiation dose-rate on cell survival following fractionated radiation therapy. *Physics in Medicine & Biology*, 57(6) 1561-1573, 2012.

Manuscripts under revision at peer-reviewed international journals

1. **Subhadip Paul**, J. M Maurer, N. Anderson, Andrew Mayer, Vince Calhoun, Kent A. Kiehl. Machine learning of diffusion tensor imaging detects traumatic brain injury in the incarcerated adult male offenders.

2. J. M Maurer, **Subhadip Paul**, B. Edwards, N. Anderson, P. Nyalakanti, C. Haranski, J. Decety, Kent A. Kiehl. Reduced uncinate fasciculus structural integrity in incarcerated adult females with elevated psychopathic traits.

3. Vikas Pareek, **Subhadip Paul**, Prasun Kumar Roy. Alterations of Trans-callosal fiber integrity and its connectivity in high grade gliomas: Whole Brain and Hemisphere Specific Analyses.

4. J. M Maurer, **Subhadip Paul**, N. Anderson, G. Clarke, P. Nyalakanti, Kent A. Kiehl. The relationship between self-report youth psychopathy measures and structural integrity in the uncinate fasciculus.

Presentations/ Abstracts in International Conferences

1. Subhadip Paul, A. Arora, R. Midha, D. Vu, P. K. Roy and M. Belmonte. Autistic traits are both distributed and localised within structural and functional brain networks. International Society for Autism Research, Montreal, Canada, 2019

2. M. K. Belmonte, D. Vu, **Subhadip Paul**, A. Arora, R. Midha, P. K. Roy. Individual variations in autistic traits are reflected in brain network topologies: behavioural, psychometric and neuroimaging assays. *Experimental Psychology Society Meeting*, Leicester, UK. 2018.

3. **Subhadip Paul** and Sagnik Bhattacharyya. Genetic liability of right entorhinal cortex to cannabis use. *Winter Science Meeting of Academy of Medical Sciences,* London, UK, 2017.

4. S. Sen, **Subhadip Paul**, P. Parisar, P. Raghunathan, S. Kumaran, S. Iyenger. A three-dimensional stereotaxic MRI brain atlas of house crow (*Corvus splendens*). *Society for Neuroscience Annual Meeting,* San Diego, USA, 2016.

5. **Subhadip Paul,** V. S. Mehta, P. K. Roy. Alteration of small world anatomical networks in the patients with brain lesions. *Society for Neuroscience Annual Meeting,* Washington DC, USA, 2014.

6. **Subhadip Paul,** K. Durgaprasad, J. Vadlamudi, S. Kondra, S. Rallabandi and P. K. Roy. Construction of Indian MRI brain template. *Society for Neuroscience Annual Meeting,* New Orleans, USA, 2012.

7. **Subhadip Paul,** V. S. Mehta and P. K. Roy. Higher rank diffusion tensor imaging of brain tumours. *Annual Meeting of the Organization on Human Brain Mapping,* Quebec City, Canada, 2011.

8. **Subhadip Paul** and Prasun K. Roy. Correlated noise induced modification of DNA single strand break by environmental radiation. Stochastic Resonance 2008 (1998SR2008), Perugia, Italy, 2008.

9. Vani Kashyap, Tanuj Gulati, **Subhadip Paul**, Prasun Roy. Stochastic approach to diagnostic characterization of MRI using fractal morphometry: An initial study. *Neuroscience Research*. Kyoto, Japan, 55S, S72, 2006.

Presentations/ Abstracts in National Conferences

1. **Subhadip Paul**, Daniel Polders, Veer S. Mehta, Pater Luijten, Hans Hoogduin and P. K. Roy. Tumourigenic field model of neoplastic growth. *Indian Academy of Neurosciences Annual Meeting*, New Delhi, 2011.

2. **Subhadip Paul**, Veer Singh Mehta and Prasun K. Roy. In vivo non-invasive characterization of brain tumour tissue using higher (fourth) order DTI. *Indian Academy of Neurosciences Annual Meeting*, Jaipur, 2009.

3. **Subhadip Paul** and Prasun K. Roy. Diffusion tensor imaging and its application to brain tumor margin delineation. *National Workshop cum Training Programme on Advanced Numerical Techniques and Applications*, BHU (Varanasi), 2009.

4. **Subhadip Paul,** Kanad Basu and Prasun K. Roy. Radiation therapy planning of brain tumours using stochastic perturbation. *NBRC International Conference*, New Delhi, 2006.

MENTORING OF M.Sc. STUDENTS AT KING'S COLLEGE LONDON

M.Sc. students: Sana Bestwn, Camille Meze, Dominic Burrows.

RESEARCH SKILLS

Mathematical/Computational modelling of large-scale multi-modal neuro-imaging signals, Quantitative genetic analyses under twin study design, Heritability estimation of complex phenotypes, Tensor valued data analyses, Advanced graph theory, structural, functional neuroimaging and behavioral data analyses, Machine learning for data classification, Stochastic dynamical modeling of biological systems, Multi-variate statistical analyses and Neuroscience.

Programming skill: I have extensive experiences of developing computational tools for analyzing large-scale neuroimaging datasets.

INVOLVEMENT WITH INDUSTRY

I participated in a collaborative research between **Philips Healthcare**, India and **National Brain Research Centre**, India to develop a novel brain imaging method.

AD HOC REVIEWER

Psychological Medicine, Journal of Physics: Complexity, Biomedical Physics and Engineering Express.

CONTACT DETAILS

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AD HOC REVIEWER

Psychological Medicine, Journal of Physics: Complexity, Biomedical Physics and Engineering Express.

PERSONAL DETAILS

Nationality: Indian (by birth), Gender: Male. DOB: 26th November, 1980.

Address for communication:

Dr. Subhadip Paul, The Mind Research Network, 1101 Yale Blvd NE, Albuquerque, New Mexico 87106, U.S.A. Mobile phone number: +1-505-721-0984, emails: **subhadippaul@gmail.com**, subpaul@mrn.org

Permanent address:
Subhadip Paul, C/O Madhab Chandra Paul, Opposite UCO Bank, Falakata Road, Madhyapara, Dhupguri, P.O. Bairatiguri, Dist. Jalpaiguri, West Bengal, PIN 735210, India.