

Dr. GAURAV MAJUMDAR

Assistant Professor
Department of Zoology
Central University of Allahabad
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Date of Birth: 7th August 1984

Research Skills

Molecular biology and histological methods, Mutant generation in Mycobacterium, Protein expression and characterization, Real time PCR, In-situ Hybridization, Transcriptomics, Basic MRI scanning and data, processing (3D, fMRI), Manganese enhanced Magnetic Resonance Imaging (MEMRI), Extensive working experience in BSL3 setup, Expertise in Small animal handling with FELASA C certification

Ph.D. (2015): "Molecular basis of photoperiodic induction of seasonal responses in migratory Redheaded bunting, *Emberiza bruniceps*". **University of Delhi**, India

Diploma (2017): Laboratory Animal Sciences, University of Antwerp, Belgium

Education and Positions held:

- 1) 2021 April-Present: Senior Research Assistant, University of Glasgow, UK
- 2) 2018 Oct-2021 March: FWO Postdoctoral fellow in University of Antwerp, Belgium
- 3) 2016-2018: BELSPO Postdoctoral fellow in University of Antwerp, Belgium
- 4) 2015-2016: Postdoctoral fellow in University of Capetown, South Africa.
- 5) 2010-2015: Ph.D. in Zoology from University of Delhi, India.
- 6) 2005-2007: Master of Science (Major in Zoology, Environmental Physiology), University of Calcutta. A+ (4.97/ 6.00).
- 7) 2002-2005: Bachelor of Science (Major in Zoology), University of Calcutta

Fellowships and Project awards received:

- 1) 2009-2014: Research Fellowship (Govt. of India): **Independent fellowship For Ph.D.**
- 2) BELSPO Non-EU postdoctoral fellowship (2015): **Independent project fellowship, Govt. Of Belgium (Fellowship for 18 months + 1500 EUR research funding)**
- 3) KP-BOF (2017): **Research fund for independent project (7500 EUR)**
- 4) BOF "Umbrella fellowship" (2018): **Independent Post-Doctoral fellowship**
- 5) FWO (2018-2021): **Independent project fellowship, Govt. Of Belgium (Fellowship for 3 years + 12000 EUR research funding)**

Area of Research

1) CDRI (Govt of India): Molecular mechanism involved in survival of *M. tuberculosis*. The project involved studying PONA1 gene to test mycobacterial survival in beta lactam rich environment

2) University of Delhi: Mechanism of adaptations to seasonal changes in an avian species. The Ph.D project studied an array of gene expression which are involved in metabolic and neurological adaptation to changing seasons. Neurogenesis and its relation to metabolic adaptation was also explored.

3) University of Cape town: Aerobiology of *M. tuberculosis*. The project was designed to develop new methods to detect mycobacterium in sampled air. FACS, fluorescent and electron microscopy along with microbiological based methods were probed. *A novel method to obtain whole genome mutations in virulent mycobacterium was developed.*

4) University of Antwerp: Role of light on neuroplasticity. Along with extensive RNAseq analysis, novel MRI based methods (MEMRI, fMRI) is being developed and used to detect neuroplastic changes in developing brain specifically to study the role of light in influencing neuroplasticity.

5) University of Glasgow: Molecular and neuronal changes associated with seasonality with special focus on detection of environmental light.

Scientific Societies/ Journal editorial board

- 1) Life member: Indian Society for Chronobiology
- 2) Yearly member: European Society for Molecular Imaging
- 3) Yearly member: British society for Neuroendocrinology (BSN)
- 4) Co-editor: Journal of Experimental Zoology A: special issue; seasonality in birds and mammals

Research manuscripts

Published:

- 1) Jasmien Orije, Sander R. Raymaekers, Gaurav Majumdar et al., (2022). Unravelling the role of thyroid hormones in seasonal neuroplasticity in European Starlings (*Sturnus vulgaris*). *In press*. Frontiers in Neuroscience
- 2) Timothy A Liddle, Tyler J Stevenson, **Gaurav Majumdar** (2022). Photoperiodic regulation of avian physiology: from external coincidence to seasonal reproduction. *In press*. Journal of Experimental Zoology Part A.
- 3) Tyler J Stevenson, Timothy A Liddle, Calum Stewart, Christopher J Marshall, **Gaurav Majumdar** (2022). Neural programming of seasonal physiology in birds and mammals: a modular perspective. *Hormones and Behavior*. 142; 105153
- 4) **Gaurav Majumdar**, Garima Yadav, Shaile Malik, Sangeeta Rani, Jacques Balthazart, Vinod Kumar (2021). Hypothalamic plasticity in response to changes in photoperiod and food quality: an adaptation to support pre-migratory fattening in songbirds? *European Journal of Neuroscience*. 53:430–448
- 5) Jolien Diddens, Louis Coussement, Carolina Frankl-Vilches, **Gaurav Majumdar**, Sandra Steyaert, Sita Minke Ter Haar, et al., (2021). DNA methylation regulates transcription factor specific neurodevelopmental but not sexually dimorphic gene expression dynamics in zebra finch telencephalon. *Frontiers in Cell and Developmental Biology*. Volume 9, article 5835555
- 6) Lore M Peeters; Monica Van den Berg; Rukun Hinz; **Gaurav Majumdar**; Isabel Pintelon; Georgios A Keliris (2020). Cholinergic modulation of the default mode like network in rats. *iScience*. 23:9; 101455
- 7) Garima Yadav*, **Gaurav Majumdar***, S. Namram Singh (2020). A histological view of the thin avian skin. *Acta Zoologica*; 00:1–8 ***Equal contribution**
- 8) **Gaurav Majumdar**, Garima Yadav, Julie Hamaide et al., (2020). Molecular correlates of hypothalamic development in songbird ontogeny in comparison with the telencephalon. *The FASEB Journal*. 2020; 34: 4997– 5015
- 9) **Gaurav Majumdar**, Rendani Mbau, Vinayak Singh, Digby F. Warner, Marte Singsås Dragset, and Raju Mukherjee (2016). Genome-wide transposon mutagenesis in *Mycobacterium tuberculosis* and *Mycobacterium smegmatis*. Book chapter in “*In Vitro Mutagenesis: Methods and Protocols*”. *Methods in Mol. Biol.* Springer Publications, volume 1498. *Book Chapter on Originally Developed protocol*.
- 10) **Gaurav Majumdar**, Garima Yadav, Sangeeta Rani, Vinod Kumar (2015). Bird eyes distinguish summer from winter: Retinal response to acute photoperiod change in night-migratory redheaded bunting. *Journal of Chemical Neuroanatomy*, 68; 55-60.
- 11) **Gaurav Majumdar**, Amit k Trivedi, Neelu J Gupta, Vinod Kumar (2015). Circadian synchronization determines critical day length for seasonal responses. *Physiology and Behaviour*, 147; 282-290

- 12) **Gaurav Majumdar**, Sangeeta Rani, Vinod Kumar (2015). Hypothalamic gene switches control transitions between seasonal life history states in a night migratory photoperiodic songbird. *Molecular and Cellular Endocrinology*, 399; 110-121.
- 13) **Gaurav Majumdar**, Garima Yadav, Sangeeta Rani, Vinod Kumar (2014) A photoperiodic molecular response in migratory redheaded bunting exposed to a single long day. *General and Comparative Endocrinology*, 204;104-113. *Cover page article for August 2014 issue.*

Preprints/ Under Revision:

- 1) **Gaurav Majumdar**, Garima Yadav, S. Namram Singh (2021). Photoperiodic physiology of summer breeding birds and a search for the role of eye. *To be resubmitted (1st revision)* in *Journal of Zoology*.
- 2) **Gaurav Majumdar**, Tyler J Stevenson, Lisbeth Van Ruijssevelt, Johan Van Audekerke, Annemie Van Der Linden. (2022). 'Time-of-day' dependent contextual female response to male songs is lateralized in songbirds. *Under revision in Journal of Biological Rhythms*

In preparation:

- 1) **Gaurav Majumdar**, Subhajit Das, Garima Yadav, Wim Vanden Berghe, Annemie Van Der Linden (2022) Ontogenic expression of non-visual opsins in zebra finch telencephalon. *To be communicated*
- 2) Garima Yadav*, **Gaurav Majumdar***, Elisabeth Jonckers, Johan Van Audekerke, Annemie Van Der Linden (2022). Retinal Manganese based MRI: Functional in-vivo method to study visual system in songbirds. *Under preparation *Equal contribution*
- 3) **Gaurav Majumdar**, Garima Yadav, Daan Verhaege, Roos Vandenbroucke, Annemie Van Der Linden (2022). PV-OTX2-PNN based regulation of critical period of song learning in song bird ontogeny. *Under preparation **

Journal cover page

Majumdar et al., p 104-113. *General and Comparative Endocrinology*, August 2014.

Major abstract of papers presented in Conferences/Symposia (last 4 years):

- 1) **Gaurav Majumdar**, Timothy Liddle, Tyler Stevenson 2021. Molecular programs of avian photoperiodism. Invited Talk, Annual Seasonality Symposium, Glasgow UK.
- 2) **Gaurav Majumdar**, Tyler J Stevenson 2021. Opsins and birds. The clock club, Uni of York
- 3) **Gaurav Majumdar**, Subhajit das, Gizem Nalbant, Tyler Stevenson, Wim Vanden Berghe, Annemie Van Der Linden. 2021. GPCR expression during songbird brain development reveals ontogeny dependent expression of non-visual opsins in telencephalon. BSN-SNE 2021, Bordeaux, France.
- 4) **Gaurav Majumdar**, Subhajit das, Gizem Nalbant, Tyler Stevenson, Wim Vanden Berghe, Annemie Van Der Linden. 2021. GPCR expression during songbird brain development reveals ontogeny dependent expression of non-visual opsins in telencephalon. ICC 2021, Bangalore, India. *Best Poster award.*
- 5) **Gaurav Majumdar***, Garima Yadav*, Daan Verhaege2*, Roos Vandenbroucke, Annemie Van Der Linden. 2020. Does OTX2 regulates the critical period of song learning in songbirds? FENS 2020, Glasgow
- 6) **Gaurav Majumdar**, Garima Yadav, Sangeeta Rani, Vinod Kumar. Hypothalamic neurogenesis in a migratory bird: An adaptive mechanism. fTALES (Neuroplasticity and neuromodulation at different scales). 6th June 2019. University of Antwerp