

Devraj Singh  
Postdoctoral Fellow  
(Environmental Resilience Grand challenge)  
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### **Education**

- 2010-14      PhD, Zoology, University of Delhi    Thesis: Molecular Analysis of timekeeping in Passerine finch. Under the supervision of Prof. Vinod Kumar, Department of Zoology, Delhi University, India.
- 2007-10      Junior research fellow, DST-IRHPA UNIT, Zoology, University of Lucknow, India
- 2005-07      Master of Science, Zoology Department, University of Lucknow, India
- 2003-05      Bachelor of Science, Zoology Department, University of Lucknow, India

### **Award / recognitions received**

- 2016      Travelling support grant from Company of Biologist (UK), to visit Prof Scott V Edwards lab, Harvard University (2500 GBP).
- 2016      Travel support from Science and Engineering research board, Department of science and technology (DST, SERB) to attend "11th International Symposium on Avian Endocrinology" (Niagara-on-the-Lake, ON, Canada. October 11-14, 2016).
- 2016      CICS-INSA travel support to attend "11th International Symposium on Avian Endocrinology" (Niagara-on-the-Lake, ON, Canada. October 11-14, 2016).
- 2015      Young Scientist award by Science and Engineering research board, Department of science and technology (DST, SERB) to pursue independent project and establish as an independent researcher (Project no. YSS/2015/001682).
- 2014      Society for Research on Biological Rhythms (SRBR) Montana, USA Research Merit Award 2014.
- 2011      SHASTRI Indo-Canadian Institute "travel subsidy grant award" 2011.
- 2009      Best participant award in SERC School in Chronobiology 2009, organized by Department of Zoology, North-Eastern Hill University, Shillong, India.
- 2006      First rank in M.Sc. previous year (2006), awarded by Prof. K.N. Bahl Memorial Society, Department of Zoology, University of Lucknow, India.

## Research Publications

Mishra I, **Singh D**, Kumar V. (2017). Daily levels and rhythms in circulating corticosterone and insulin are altered with photostimulated seasonal states in night-migratory blackheaded buntings. *Hormones and Behavior*, 94: 114-123.

Mishra I, **Singh D** and Kumar V. (2017) Seasonal alteration in the daily rhythms in hypothalamic expression of genes involved in the photoperiodic transduction and neurosteroid-dependent processes in migratory blackheaded buntings. *Journal of neuroendocrinology*. doi:10.1111/jne.12469.

**Singh D** and Kumar V. (2017) Extra-hypothalamic brain clocks in songbirds: Photoperiodic state dependent clock gene oscillations in night-migratory blackheaded buntings, *Emberiza melnocephala*. *Journal of photochemistry and photobiology B: Biology*. 169:13-20.

Kumar R, **Singh D**, Rani S and Malik S. (2016) Seasonal trend in movement directions at dawn and dusk: a study on crow and white herons. *Biological Rhythm Research* (<http://dx.doi.org/10.1080/09291016.2016.1164282>).

**Singh D**, Trivedi N, Malik S, Rani S and Kumar V. (2016) Timed food availability affects circadian behavior but not the neuropeptide Y expression in Indian weaverbirds exposed to atypical light-dark and constant dim light environment. *Physiology and Behaviour*. DOI: 10.1016/j.physbeh.2016.04.017

Mishra I\*, **Singh D**\* and Kumar V. (2016) Daily Expression of Genes Coding for Neurotransmitters in Central and Peripheral Tissues of Redheaded Buntings: Implication for Circadian Regulation of Physiology in Songbirds. *Chronobiology International* (DOI:10.3109/07420528.2016.1139587). [\* equal contribution]

**Singh D.**, Trivedi A K., Rani S., Panda S. and Kumar V. (2015) Circadian timing in central and peripheral tissues in a migratory songbird: Dependence on annual life-history states. *FASEB Journal* (FASEB J. pii: fj.15-275339. [Epub ahead of print] PMID: 26103987.

**Singh D., Rani S. & Kumar V. (2013)** Daily expression of six clock genes in central and peripheral tissues of the night- migratory redheaded bunting: Evidence for tissue specific circadian clocks. *Chronobiology International* (DOI: 10.3109/07420528.2013.810632).

**Singh D., Kumari Y., Rastogi A., Rani S. & Kumar V. (2013)** Neuropeptide Y mRNA and peptide in brain of the night-migratory redheaded bunting. *Cell and Tissue Research* (DOI 10.1007/s00441-013-1667-x).

### **Book Chapter**

Trivedi AK, **Singh D**, Dixit AS and Kumar V. (2017) Pineal gland, melatonin and timekeeping in non-mammalian vertebrates: Avian perspective. *Biological Timekeeping: Clocks, Rhythms and Behaviour*. Book Chapter, Springer publication. DOI 10.1007/978-81-322-3688-7

### **Presentations (Talk)**

**D. Singh, V. Kumar.** *De novo* RNA Sequencing of hypothalamus and liver reveals the changes in seasonal adaptive mechanisms in a night-migratory blackheaded bunting. XXVI National Symposium on Chronobiology 2016. 2<sup>nd</sup> and 3<sup>rd</sup> June, University of Mysore, India. (**Presenting author**)

**D. Singh, A. Sharma, V. Kumar.** Daily changes in clock gene oscillations in extra-hypothalamic brain regions of night-migratory blackheaded buntings. XXVI National Symposium on Chronobiology 2016. 2<sup>nd</sup> and 3<sup>rd</sup> June, University of Mysore, India.

**D. Singh, Khyati, S. Yadav, R. Sagar, V. Kumar, R. K. Seth.** Effect of sub-lethal radiation on diurnal expression of clock genes in reproductive tissues of noctuid pest, *Spodoptera litura* (Fabricius) (Lepidoptera: Noctuidae). XXVI National Symposium on Chronobiology 2016. 2<sup>nd</sup> and 3<sup>rd</sup> June, University of Mysore, India.

**D. Singh, A. K. Trivedi, V. Kumar.** Seasonal Life-History Dependent Circadian Timing in Migratory Songbirds. Cold Spring Harbor Asia Symposium on Biological Rhythms 2015 October 26-30 China.

**D. Singh, S. Rani, V. Kumar.** Circadian and metabolic changes associated with seasonal physiological states in migratory songbirds (*Emberiza melanocephala*). Society for research on biological rhythms (SRBR) 2014. 14<sup>th</sup> – 19<sup>th</sup> June, Montana, USA. **(Presenting author)**

**D. Singh, A. K. Trivedi, S. Rani, V. Kumar.** Circadian Clock genes in different physiological states of Palearctic-Indian migrant blackheaded bunting (*Emberiza melanocephala*). International Congress on Chronobiology (Focal Theme: Biological clocks and Health issues in the 21<sup>st</sup> century) & 24<sup>th</sup> Conference of the Indian Society for chronobiology, department of Zoology, University of Delhi, India. 3<sup>rd</sup> -7<sup>th</sup> October 2012. **(Presenting author)**

**D. Singh, S. Srivastava, A. Srivastava, S. Rani, V. Kumar.** Partial cloning of photoperiod regulated genes and their expression during photosensitive and photorefractory life history stages in the migratory black headed bunting (*Emberiza brunicep*). XXI National Symposium on Chronobiology from 02-04 february 2010. Jamshedpur Co-operative College, Jamshedpur. **(Presenting author)**

**D. Singh, S. Rani, V. Kumar.** Differential expression of Dio2 under short days and long days in migratory Redheaded bunting (*Emberiza bruniceps*). DST and UGC sponsored symposium on Animal Biodiversity: Physiological aspect of environment strategies 19<sup>th</sup> and 20<sup>th</sup> Feb 2010. MMH College Ghaziabad. **(Presenting author)**

**D. Singh, N. Trivedi, S. Malik, S. Rani, V. Kumar.** Restricted Feeding as a Synchronizer of the Circadian Activity Rhythms. XXII National Symposium on Chronobiology (March 15-17, 2011). Kurukshetra University. **(Presenting author)**

**D. Singh, S. Rani, V. Kumar.** Rhythmic Expression of Timekeeping Genes in a Night Migratory Song bird. XXIII National Symposium on Chronobiology and Seminar on Diversity and Physiology of Desert fauna (March 1-3 2012) JNV University, Jodhpur. **(Presenting author)**

### **Presentations (Poster)**

I. Mishra, **D. Singh, S. K. Bhardwaj, V. Kumar.** Seasonality in daily rhythms of Neurotransmitters in a migratory songbird. Cold Spring Harbor Asia Symposium on Biological Rhythms 2015 October 26-30 China.

I. Mishra, **D. Singh**, S. Rani, V. Kumar. Circadian rhythm of neurotransmitters and neuromodulators in central and peripheral tissues of a migratory song bird. 26<sup>th</sup> International Ornithological Congress (August 17 - 24 2014) , Tokyo , Japan .

**D. Singh**, Y. Kumari, S. Rani, V. Kumar. Cloning & Characterization of selected timekeeping genes in a migratory songbird, the redheaded bunting (*Emberiza bruniceps*). Symposium of circadian rhythms research in Canada. Douglas Mental Health Institute/McGill, Montreal, Quebec, Canada. June 2-3, 2011. **(Presenting author)**

**D. Singh**. Temporal expression of clock genes in redheaded bunting (*Emberiza bruniceps*). 5<sup>th</sup> Euclock & 19<sup>th</sup> European Ph.D. School for Chronobiology, held in Bangalore, India from October 2 -9, 2010. **(Presenting author)**

**D. Singh**, J. Singh, S. Srivastava, S. Rani, V. Kumar. Involvement of Type 2 Deiodinase (Dio2) and Type 3 Deiodinase (Dio3) in Photoperiodic Regulation of Seasonal Responses in Migratory Blackheaded bunting (*Emberiza melanocephala*). International conference on novel updates in reproductive biology and comparative endocrinology and the 27<sup>th</sup> Annual meeting of the Society for reproductive biology and comparative endocrinology (SRBCE- XXVII). University of Hyderabad. India. January 19-21, 2009. **(Presenting author)**

### **Journal reviewer**

Plos One

The Auk: Ornithological Advances

Peer J

### **Grant reviewer**

SERB-DST - Extra Mural Research Funding, Young Investigator Startup grant

### **Society Memberships**

Annual member, Society for Research on Biological Rhythms (SRBR)

Annual member, Canadian Society for Chronobiology

Annual member, Indian Science Congress Association

Life member, Indian Society for Chronobiology