




Faculty Details proforma for DU Web-site

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cc: director@ducc.du.ac.in)

Title	Prof.	First Name	Vinod	Last Name	Kumar	Photograph
Designation		Professor				
Address		Department of Zoology, Lab 217/ 218 University of Delhi (North Campus) Delhi – 110 007 India				
Phone No Office		011-27667985 Ext 212, 218				
		Residence		011-27666807		
		Mobile		09818875429		
Email Web-Page		drvkumar11@gmail.com				
Educational Qualifications						
Degree		Institution			Year	
Ph.D.		Ph.D. (Zoology), Banaras Hindu University			1981	
Career Profile						
Organization/ Institution		Designation		Duration		Role
University of Delhi, Delhi (University of Lucknow, Lucknow)		Professor Of ZOOLOGY		01 Januray 2000-Contd. (1 Jan 2000 – 15 April 2009 at Univ. of Lucknow)		Teaching and Research
Areas of Interest / Specialization						
<ol style="list-style-type: none"> 1. Physiology (Chronobiology/ Physiology of seasonal reproduction and migration/ Behavioral Neuroscience) 2. Endocrinology (Comparative Endocrinology/ Neuroendocrinology) 3. Avian Behaviour and Life history studies 						
Subjects Taught						
Physiology, Animal Behaviour, Chronobiology, Comparative Endocrinology, Endocrinology and Reproductive Physiology, Regulatory and Behavioral Neuroscience. Have taught both at undergraduate and post-graduate levels since 1983 in five different Indian universities and in one United State university (Texas A & M University).						
Research Guidance						
<ol style="list-style-type: none"> 1. Doctoral Thesis awarded – 15 2. Doctoral Thesis work under supervision- 08 3. Awarded M.Phil dissertations – 13 						
Publications Profile						

1. Books/ Journal (Authored/Edited)

- 2017 Biological Timekeeping: Clocks, Rhythm and Behaviour (edited; Springer-Verlag)
2017 Biological Rhythm Research, Special volume, Guest editor (Taylor-Francis, UK)
2014 Indian J. Exp. Biology, special volume, Guest editor (CSIR Publications, New Delhi)
2002 Biological Rhythms (edited; Narosa Publ. House, New Delhi/Springer-Verlag)
1996 Animal Behaviour (Himalaya Publishing House, Bombay)

2. Research papers published in Refereed/Peer Reviewed Journals (last 5 years)

A. Sharma, D. Singh, S. Das and **V. Kumar** (2018) Hypothalamic and liver transcriptome from two critical life-history stages in a migratory songbird. *Experimental Physiology* doi: 10.1113/EP086831

I. Mishra, D. Singh and **V. Kumar** (2018) Temporal expression of c-fos and genes coding for neuropeptides and enzymes of amino acid and amine neurotransmitter biosynthesis in retina, pineal and hypothalamus of a migratory songbird: Evidence for circadian rhythm dependent seasonal responses. *Neuroscience* 371:309-324.

S. K. T. Taufique, A. Prabhat and **V. Kumar** (2018) Constant light environment suppresses maturation and reduces complexity of new born neuron processes in the hippocampus and caudal nidopallium of a diurnal corvid: Implication for impairment of the learning and cognitive performance. *Neurobiology of Learning and Memory* 147: 120-127.

N. Agarawal, I. Mishra, S. Rani and **V. Kumar** (2018) Temporal Expression of Clock Genes in Central and Peripheral Tissues of Spotted Munia under Varying Light Conditions: Evidence for Circadian Regulation of Daily Physiology in a Non-photoperiodic Circannual Songbird species. *Chronobiology International* doi: 10.1080/07420528.2017.1422742

V. Kumar and I. Mishra (2017). Circannual rhythms. *Encyclopaedia of Reproduction*, 2nd Edition. Chapter # 76 (in Press).

N. Agarawal, I. Mishra, R. Komal, S. Rani and **V. Kumar** (2017) Circannual testis and moult cycles persist under photoperiods that disrupt circadian activity and clock gene cycles in spotted munia. *Journal of Experimental Biology* 220: 4162-4168.

N. A. Jha and **V. Kumar** (2017) Effect of no-night light environment on behaviour, learning performance and personality in zebra finches. *Animal Behaviour* (in press)

T. J. Stevenson and **V. Kumar** (2017) Neural control of daily and seasonal timing of songbird migration. *Journal of Comparative Physiology A* DOI: 10.1007/s00359-017-1193-5

I. Mishra and **V. Kumar** (2017) Circadian basis of seasonal timing in higher vertebrates. *Biological Rhythm Research* 10.1080/09291016.2017.1345447.

A. Yadav, R. Kumar, J. Tiwari, **V. Kumar** and S. Rani (2017) Sleep in birds: Lying on the continuum of activity and rest. *Biological Rhythm Research*. DOI 10.1080/09291016.2017.1346850

I. Mishra, D. Singh and **V. Kumar** (2017) Seasonal alterations 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

N. J. Gupta, **V. Kumar** and S. Panda. A camera-phone based study reveals erratic eating pattern and disrupted daily eating-fasting cycle among adults in India. *PLoS One* 12(3): e0172852. doi:10.1371/journal.pone.0172852

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

N. A. Jha and **V. Kumar** (2017) Female conspecifics restore rhythmic singing behaviour in arrhythmic zebra finches. *Journal*

of *Biosciences* 42: 139-147.

I. Mishra, S. K. Bhardwaj, S. Malik and **V. Kumar** (2017) Concurrent hypothalamic gene expression under acute and chronic long days: Implications for initiation and maintenance of photoperiodic response in migratory songbirds. *Molecular and Cellular Endocrinology* 439: 81-94.

S. K. T. Taufique and **V. Kumar** (2016) Differential activation and tyrosine hydroxylase distribution in the hippocampal, pallial and midbrain brain regions in response to cognitive performance in Indian house crows exposed to abrupt light environment. *Behavioural Brain Research* 314: 21-29.

N. A. Jha and **V. Kumar** (2016) Protein rich food does not affect singing behavior and song quality in adult zebra finches, *Taeniopygia guttata*. *Current Science* (in press)

D. Singh, N. Trivedi, S. Malik, S. Rani and **V. Kumar** (2016) Timed food availability affects circadian behavior but not the neuropeptide Y expression in Indian weaverbirds exposed to atypical light environment. *Physiology & Behavior* 161: 81-89.

Surbhi, A. Rastogi, S. Malik, S. Rani and **V. Kumar** (2016) Seasonal neuronal plasticity in song-control and auditory forebrain areas in subtropical non-migratory and Paelearctic-Indian migratory male songbirds. *Journal of Comparative Neurology* doi: 10.1002/cne.24000

O. P. Singh, S. Kumar, U. Singh, **V. Kumar**, R. Lechan and P. Singru (2016) Cocaine-and amphetamine regulated transcript peptide (CART) in the brain of zebra finch, *Taeniopygia guttata*: Organization, interaction with neuropeptide Y, and response to changes in energy status. *Journal of Comparative Neurology* doi: 10.1002/cne.24004.

Surbhi, A. Rastogi, S. Malik, S. Rani and **V. Kumar** (2016) Changes in brain peptides associated with reproduction and energy homeostasis in photosensitive and photorefractory migratory redheaded buntings. *General and Comparative Endocrinology* 230-231: 67-75.

I. Mishra, D. Singh and **V. Kumar** (2016) Daily expression of genes coding for neurotransmitters in central and peripheral tissues of redheaded bunting: implication for circadian regulation of physiology in songbirds. *Chronobiology International* 33: 280-292.

A. K. Trivedi, J. Kumar, S. Rani, **V. Kumar** (2016) Pinealectomy abolishes circadian behavior and interferes with circadian clock gene oscillations in brain and liver but not retina in a migratory songbird. *Physiology & Behavior* 156: 156-163.

S. K. T. Taufique, N. A. Jha and **V. Kumar** (2016) Circadian rhythm determines the timing of activity, and ingestive and grooming behaviours in Indian house crows, *Corvus splendens*. *Current Science* 110: 897-901.

A. Rastogi, Surbhi, S. Malik, S. Rani and **V. Kumar** (2016) Annual life-history dependent differences in the seasonal change in neural activity of the olfactory system between non-migratory and migratory songbirds. *Behavioural Brain Research* 296:233-239.

D. Singh, A. K. Trivedi, S. Rani, S. Panda and **V. Kumar** (2015) Circadian timing in central and peripheral tissues in a migratory songbird: Dependence on annual life-history states. *The FASEB Journal* doi:10.1096/fj.15-275339.

G. Majumdar, G. Yadav, S. Rani and **V. Kumar** (2015) Bird eyes distinguish summer from winter: Retinal response to acute photoperiod change in the night-migratory redheaded bunting. *Journal of Chemical Neuroanatomy* (in press).

G. Majumdar, S. Rani and **V. 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.

Surbhi, A. Rastogi, S. Rani and **V. Kumar** (2015) Seasonal plasticity in the peptide neuronal systems: Potential roles of GnRH, GnIH, NPY and VIP in regulation of reproductive axis in subtropical Indian weaver birds. *Journal of Neuroendocrinology*

27(5): 357-369.

G. Majumdar, A. K. Trivedi, N. J. Gupta and **V. Kumar** (2015) Circadian synchronization determines critical day length for seasonal responses. *Physiology and Behavior* 47: 282-290.

A. K. Trivedi, J. Kumar, S. Rani and **V. Kumar** (2015) Adaptation of oxidative phosphorylation to photoperiod-induced seasonal metabolic states in migratory songbirds. *Comparative Biochemistry Physiology A Mol Integr Physiol* 184C: 34-40.

S. Malik, J. Singh, A. K. Trivedi, S. Singh, S. Rani and **V. Kumar** (2015) Nocturnal melatonin levels decode daily light environment and reflect seasonal states in night-migratory blackheaded bunting (*Emberiza melanocephala*) *Photochemistry and Photobiological Sciences* 14, 963-971.

G. Yadav, S. Malik, S. Rani and **V. Kumar** (2015) Role of light wavelengths in synchronization of circadian physiology in songbirds. *Physiology and Behavior* 140:164-171.

A. K. Trivedi, J. Kumar, S. Rani and **V. Kumar** (2014) Annual life history-dependent gene expression in the hypothalamus and liver of a migratory songbird: Insights into the molecular regulation of seasonal metabolism. *Journal of Biological Rhythms* 29:332-345.

P. Budki, S. Malik, S. Rani and **V. Kumar** (2014). Circadian rhythms are not involved in the regulation of circannual reproductive cycles in a sub-tropical bird, the spotted munia. *Journal of Experimental Biology* 217:2569-2579.

Surbhi, Y. Kumari, S. Rani, K. Tsutsui and **V. Kumar** (2014) Duration of melatonin regulates seasonal plasticity in subtropical Indian weaver bird, *Ploceus philippinus*. *General and Comparative Endocrinology* DOI: 10.1016/j.ygcen.2014.06.004.

Surbhi and **V. Kumar** (2014) Avian photoreceptors and their role in the regulation of daily and seasonal physiology. *General and Comparative Endocrinology* (in press). DOI: 10.1016/j.ygcen.2014.06.001

A. Srivastava, N. Trivedi, S. Malik, S. Rani and **V. Kumar** (2014) Molecular basis of photoperiodic control of reproductive cycle in a subtropical songbird, the Indian weaver bird (*Ploceus philippinus*). *General and Comparative Endocrinology* DOI: 10.1016/j.ygcen. 2014.08.012.

S. Srivastava, S. Rani and **V. Kumar** (2014) Photoperiodic induction of pre-migratory phenotype in a migratory songbird: Identification of metabolic proteins in flight muscles. *Journal of Comparative Physiology B*. 10.1007/s00360-014-0827-y.

G. Majumdar, G. Yadav, S. Rani and **V. Kumar** (2014). A photoperiodic molecular response in migratory redheaded bunting exposed to a single long day. *General and Comparative Endocrinology* 204:104-113.

S. Malik, S. Singh, S. Rani and **V. Kumar** (2014). Life at a different pace: Annual itineraries are conserved in seasonal songbirds. *Journal of Biosciences* 39: 485-491.

S. Malik, P. Budki, S. Rani and **V. Kumar** (2014). Optimization of circadian adaptation to physical enrichment: Effects on activity behavior in a subtropical songbird. *Journal of Ornithology* 155: 283-290.

S. Rani and **V. Kumar** (2014) Photoperiodic regulation of seasonal reproduction in higher vertebrates. *Indian Journal of Experimental Biology* 52: 413-419.

S. Malik, G. Yadav, S. Rani and **V. Kumar** (2014) Light wavelength dependent circadian and seasonal responses in blackheaded bunting. *Indian Journal of Experimental Biology* 52: 448-459.

A. K. Trivedi and **V. Kumar** (2014) Melatonin: An internal signal for daily and seasonal timing. *Indian Journal of Experimental Biology* 52:425-437.

I. Mishra, A. K. Trivedi and **V. Kumar** (2014) Daily behavior can differ between colour morphs of the same species: A study

on circadian activity behavior of grey and pied zebra finches. **Indian Journal of Experimental Biology** 52:516-520.

A. K. Trivedi, S. Rani and V. Kumar (2014) Circadian adaptation to seasons: Effects on activity behavior in subtropical house sparrow, *Passer domesticus*, **Biological Rhythm Research** 45: 465-475.

S. Rani and V. Kumar (2013). Avian circannual systems: persistence and sex differences. **General and Comparative Endocrinology**. 190: 61-67.

N. J. Gupta and V. Kumar (2013). Testes play a role in termination but not in initiation of the spring migration in the night-migratory blackheaded bunting. **Animal Biology** 63:321-329.

D. Singh, S. Rani and V. Kumar (2013). Daily expression of six clock genes in central and peripheral tissues of a night-migratory songbird: Evidence for tissue specific circadian timing. **Chronobiology International** 30: 1208-1217.

D. Singh, Y. Kumari, A. Rastogi, S. Rani and V. Kumar (2013). Neuropeptide Y mRNA and peptide in the night-migratory redheaded bunting brain. **Cell and Tissue Research** 354: 551-562.

A. Rastogi, Y. Kumari, S. Rani and V. Kumar (2013). Neural correlates of migration: Activation of putative hypothalamic clock(s) in and out of migratory state in the night-migratory blackheaded bunting (*Emberiza melanocephala*). **PLoS One** 8(10), e70065

P. Budki, S. Rani and V. Kumar (2012). Persistence of Circannual Rhythms under Constant Periodic and Aperiodic Light Conditions: Sex Differences and Relationship with the External Environment. **J. Exp. Biol.** 215:3754-3785.

J. Singh, A. Rastogi, S. Rani and V. Kumar (2012). Food Availability Affects Circadian Clock-Controlled Activity and Zugunruhe in the Night Migratory Male Blackheaded Bunting (*Emberiza melanocephala*). **Chronobiology International** 29: 15-25.

J. Singh, A. Rastogi, S. Rani and V. Kumar (2012) Functional similarity in relation to the external environment between circadian behavioral and melatonin rhythms in the subtropical Indian weaver bird. **Hormones and Behavior** 61: 527-534.

J. Singh, P. Budki, S. Rani and V. Kumar (2012) Temperature alters the photoperiodically controlled phenologies linked with migration and reproduction in a night-migratory songbird. **Proceeding of Royal Society B**. 279: 509-515.

3. Research papers published in Refereed/Peer Reviewed Conferences/ book chapters (last 5 years)

V. Kumar (2017) Introduction: Special issue on Rhythms, Calendar and Biological Processes. *Biological Rhythm Research*. DOI10.1080/09291016.2017.1345423

A. K. Trivedi, D. Singh, A. S. Dixit and V. Kumar (2017) Pineal gland, melatonin and timekeeping in nonmammalian vertebrates: Avian Perspective. In: Biological Timekeeping: Clocks, Rhythms and Behaviour (Ed. Vinod Kumar). Springer Nature (Springer India), New Delhi. pp. 521-541.

S. Rani, S. Singh, S. Malik and V. Kumar (2017) Insights into the regulation of spring migration in songbirds. In: Biological Timekeeping: Clocks, Rhythms and Behaviour (Ed. Vinod Kumar). Springer Nature (Springer India), New Delhi. pp. 625-642.

V. M. Cassone and V. Kumar (2014) Circadian Rhythms. In: **Sturkie's Avian Physiology**. Sixth Edition (Ed. C. G. Scanes). Elsevier (Academic Press), Amsterdam. pp. 811-828.

Conference Organization/ Presentations (in the last three years)

List against each head (If applicable)

1. *Organization of a Conference (last 5 years)*

2017 IndoUS workshop, and International Symposium on Biological Timing and Health Issues in the 21st Century.

	Feb 21-24, 2017
2012	27 th International Congress on Chronobiology, October 03-07, 2012
2. Participation as invited symposium speaker/Paper/Poster Presenter (outside India, last 5 years)	
2017	Asia Chronobiology Forum, June 2017, Hohhot, China
2017	International Symposium on Biological Timing and Health Issues in the 21 st Century, Delhi
2016	International conference on Chronobiology, China
2015	Cold Spring Harbor Asia Symposium on Biological Rhythms, China
2015	EBRS/ WCC Chronobiology conference, Manchester
2015	Neuropeptides and Neurotransmitters: Role of Physiology and Pathophysiology, Bhubaneswar, India
2014	26 th International Congress in Ornithology, Tokyo, Japan
2014	28 th International Congress on Chronobiology, Bucharest, Romania
2012	International Symposium of Avian Endocrinology, Gifu, Japan, June.
2012	Society for Integrative and Comparative Biology, S. Carolina, USA
* In addition, have participated and delivered invited talks in several national symposia/ conferences	
Research Projects (Major Grants/Research Collaboration)	
Current projects	
2016-2019	Mechanism of food-induced effects on reproduction and metabolism: A study on Zebra finches; funded by SERB
2013-2018	Anticipation in genes: Molecular, physiological and behavioral correlates of response of circannual clocks to seasons in night-migratory song birds. Funded by DBT
Completed projects	
2014-2017	IndoUS Joint Center on Biological Timing
2007-2014	Avian circadian seasonal systems: from behaviour to molecules – from IRHPA Center for Excellence grant by DST
2011-2014	Circadian brain photoreceptors in birds: Localization and functional evaluation – from CSIR
2011-2014	Neurobiology and Understanding the Circadian System Linkage of Cognitive Performance in an Avian Model System – from DST
2012-2014	Mechanism of adaptation in vertebrates- from DST.
2007-2010	Immunohistochemical study of seasonal system in birds – from CSIR
2005-2009	Role of food in regulation of circadian and seasonal responses in birds- from DST (Co-PI)
2002-2005	An immunohistochemical study of the photoperiodic transduction in birds – from CSIR
2000-2002	DST- DAAD International Collaboration project with Max-Planck Institute of Biological Rhythm Res, Germany
1999-2002	Role of melatonin in avian circadian system (SERC major project) – from DST
1999-2002	Sensitivity of circadian entrainment pathway in the bunting (<i>Emberiza</i> sp.) – from CSIR
1996-1999	Spectral sensitivity of photoreceptors mediating photoperiodic entrainment and induction in the blackheaded bunting – from CSIR
1992-1995	Light relations of circadian rhythms in the migratory blackheaded bunting, <i>Emberiza melanocephala</i> - from CSIR
1989-1992	Strategies of endogenous programming in palaeartic-Indian migratory birds – from UGC
1988-1991	Properties of biological clocks underlying photoperiodic phenomena in birds – from DST
1989-1990	Photoperiodic control of timing of gonadal regression (refractoriness) in birds – from UGC
Awards and Distinctions	
Awards	
2010	Platinum Jubilee Lecture award from Indian Science Congress Association.
2008	Vijay-Usha Sodha Scientific Research Prize, University of Lucknow
2006	P. Govindarajulu Gold Medal, Society for Reproductive Biology & Comparative Endocrinology, India
2000	Young Investigator Award, Gordon Research Conference in Pineal Cell Biology (Oxford, U.K.)
1986	Young Scientist Award from Indian Science Congress Association
International Fellowships/ Visits abroad (excludes conferences)	
2018 January Salk Institute for Biological Studies and University of California, San Diego	
2015 July Salk Institute for Biological Studies and University of California, San Diego	
2007 June-July: JSPS Visiting Fellow, Nagoya University, Japan.	
2005 February: Visitor, Max Planck Institute for Ornithology, Andechs, Germany.	
2003 Jan - 2004 August: Visiting Professor, Department of Biology, Texas A & M University, Texas, USA.	
2002 May - 2002 June: Max-Planck Gesellschaft, Germany, Visiting Fellow	

2001 June - 2001 August: Max-Planck Gesellschaft, Germany, Visiting Fellow
2000 May - 2000 August: Max-Planck Gesellschaft, Germany, Visiting Fellow
1999 May - 1999 August: Max-Planck Gesellschaft, Germany, Visiting Fellow
1997 March - 1998 February: Max-Planck Gesellschaft, Germany, Postdoctoral Fellow.
1995 March - 1996 March: CIDA-NSERC< Canada, Associateship
1992 March - 1993 March: European Economic Community (EC) Postdoctoral Fellow.
1991 Feb - 1991 December: Indian National Science Academy - The Royal Society UK Exchange Fellow.

Distinctions (honours)

2017 Editorial Board, Current Science
2014-16 Leader and Principal Investigator, IndoUS Center for Biological Timing
2013-16 Chairman, SERB School in Avian Biology, New Delhi.
2011-15 Member, Editorial Board, Journal of Integrative and Comparative Biology
2011 - Foreign member, German Ornithological Society.
2010 Convener, Symposium on Biological clocks in birds: from behaviour to molecules, International Ornithological Congress, Campos Do Jordao, SP, Brazil
2010-14 Director, SERC School in Chronobiology III: Clocks, Rhythms and Behavior
2010- Member, Committee of Representatives, Intl. Ornithological Congress.
2008 Chair, Symposium on Biological clocks and seasonal reproduction and migration Fourth International Conference in Africa for Comparative Physiology & Biochemistry, Kenya
2008 Co-Chair, Symposium on Biorhythms, 9th International Symposium on Avian Endocrinology, Leuven, Belgium
2008 Faculty, Multinational School in Chronobiology
2002-10 Faculty, SERC School of Chronobiology II: Clocks, Rhythms and Behaviour
2007 Member, Editorial Board, General and Comparative Endocrinology (USA/UK)
2007-14 Convener and Principal Investigator, DST-IRHPA Center for Excellence in Biological Rhythm Research, DST, N. Delhi
2007-11 Faculty SERC School in Neuroscience (A DST activity for 5 years)
2007-11 Faculty SERC School of Herpetology (A DST activity for 5 years)
2006 Chair, Symposium on Circadian rhythms and photoperiodism, International Ornithological Congress, Hamburg
2006 Member, Scientific Committee of the International Ornithological Congress, Hamburg
2004 Co-Chair, session on Melatonin, clock genes and seasonality, International Avian Endocrinology Meeting, Arizona
2001 Fellowship in Reproduction and Endocrinology (FRE)
2000 Member, Local Organizing Committee, VII International Symposium on Avian Endocrinology
1999 Lecturer, Erasmus School of Chronobiology, Ferrara, Italy

Association With Professional Bodies

1. *Reviewing*

Peer review of research grant proposals

Dept. of Science and Technology; Council of Scientific and Industrial Research, National Science Foundation, USA
Science and Engineering Research Board, Israel Science Foundation.

Peer review of scientific journals

Cell and Tissue Research; Comparative Biochemistry and Physiology; Chronobiology International; General and Comparative Endocrinology; Hormones and Behaviour; Indian Journal of Experimental Biology; Journal of Circadian Rhythms, Journal of Comparative Physiology; Naturwissenschaften; Plos One; Microscopy and Microanalysis. Frontiers in Neuroendocrinology. Journal of Biological Rhythms

2. *Committees and Boards:* Member Program Advisory Committee on Animal Sciences (2004-11); Member, Committee of DST-NCSTC programs; Member, National Planning Committee and Director SERC/ SERB Schools in Chronobiology, Member, National Planning Committee of SERC/SERB Schools in Neuroscience and Herpetology; Member of Board of Studies and Research Degree committees of different State, Central and Private Universities

3. *Membership of professional Societies held*

International Society of Chronobiology; Society for Integrative comparative Biology, Society for Research in Biological Rhythms (SRBR); Indian Society for Chronobiology; German Ornithological Society; Society for Reproductive Biology and Comparative Endocrinology; The Ethological Society of India; Zoological Society of India; Indian Science Congress Association

4. *Office Bearer: Secretary, Indian Society for Chronobiology; 2004-16; President, Indian Society for Chronobiology; 2017-21* Member, Executive Committee, International Society of Avian Endocrinology. Board member, International Society for Chronobiology; Member, Asia Chronobiology Forum.

Signature of Faculty Member