

## Curriculum Vitae

### DHANANANAJAY KUMAR



**LAB ADDRESS:** Associate Professor  
Laboratory of Integrative Physiology,  
Department of Zoology,  
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New Delhi, Pin-110045  
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### EDUCATION & TRAINING

2001-2004 Bachelor of Science (BS), Biosciences (First Div.)  
Jamia Milia Islamia, New Delhi, India

2004-2006 Master of Science (MS), Biosciences (First Div.)  
Jamia Milia Islamia, New Delhi, India

2007-2014 PhD in Biosciences, Department of  
Zoology, Banaras Hindu University,  
Varanasi, UP, India

### RESEARCH GRANTS as PI

| Sl. no | Position  | Funding body   | Amount      |
|--------|---|--|-------------|
| 1      | <b>Cognitive Science Research Initiative-Post Doctoral Fellow (CSRI-PDF) (PI)</b> | Department of Science and Technology, New Delhi, Govt. of India<br>(From: 04.06.2019 to 03.12.2021)          | 24.86 lakhs |
| 2      | <b>SERB Fast-Track Young Scientist Fellow (PI)</b>                                | Science and Engineering Research Board (SERB), New Delhi, Govt. of India<br>(From: 01.03.2016 to 24.04.2019) | 30.8 lakhs  |

### POST-DOCTORAL APPOINTMENTS

2022- 2023 Post-Doctoral Fellow  
Laboratory of Integrative Physiology,  
Migal Galilee Research Institute, Kriyat Shmon, Israel

**CENTRAL UNIVERSITY OF JAMMU, INDIA**

|            |  |
|------------|--|
| 2019- 2021 | Principal Investigator (CSRI-PDF, DST)<br>Department of Pharmaceutical Engineering &<br>Technology, IIT-BHU, Varanasi, UP-221005, India                |
| 2016-2019  | Principal Investigator (Young Scientist Fellow, SERB)<br>Department of Pharmaceutical Engineering &<br>Technology, IIT-BHU, Varanasi, UP-221005, India |
| 2014-2016  | Post-Doctoral Fellow<br>GROW Laboratory, Narayan<br>Nethralaya Foundation, Bangalore,<br>Karnataka, India  |
| 2014-2014  | Senior Research Fellow (Extended)<br>Department of Zoology Banaras Hindu University, Varanasi, India   |

## AWARDS & HONORS

|      |  |
|------|--|
| 2011 | Best Poster award in “XXII National Symposium on Chronobiology”,<br>Organized by Department of Zoology, Kurukshetra University, Kurukshetra,<br>Haryana, India   |
| 2010 | Oral presentation award in international conference on “Radiation,<br>environment and human health, ICREH - 2010”, Nehru Gram Bharati<br>University, Allahabad, UP, India. (19-21, November 2010)                  |
| 2010 | Selected among top best Four Posters in International School “5th Euclock<br>and 19th European PhD School for Chronobiology”, held in Jawaharlal Nehru<br>Center for Advance Scientific Research, Bangalore, India |
| 2011 | <b>Senior Research Fellowship</b> (SRF) by Indian Council of Medical Research,<br>New Delhi, India (From: 05.08.2011 to 04.08.2014)  |
| 2009 | <b>Senior Research Fellow</b> (SRF) in Project Funded by Council of Scientific of<br>Industrial Research (CSIR), New Delhi, India, (From: 20.08.2009 to<br>31.12.2010)   |
| 2007 | <b>Junior Research Fellow</b> (JRF) in Project Funded by Council of Scientific of<br>Industrial Research (CSIR), New Delhi, India, (From: 27.06. 2007 to August<br>2009)   |
| 2007 | Graduate Aptitude Test for Engineering (GATE 2007), Indian Institute of<br>Technology, India   |
| 2007 | Council of Scientific of Industrial Research-University Grant Commission<br>(CSIR-UGC) “National Eligibility Test” Examination   |

**RESEARCH PUBLICATIONS**

1. Prabha Rajput, **Dhanananajay Kumar** and Sairam Krishnamurthy (2023). Chronic exposure to dim artificial light disrupts the daily rhythm in mitochondrial respiration in mice suprachiasmatic nuclei. **Chronobiology International**, **40**, 938-951 ISSN: 0742-0528. <https://doi.org/10.1080/07420528.2023.2236708>; **IF: 3.749**.
2. Megha Das, Tarun Minocha, **Dhanananajay Kumar**, Nitesh Kumar Mishra, Chandana Haldar and Sanjeev Kumar Yadav (2022). Continuous Exposure to Artificial Light Disrupts Central and Peripheral Reproductive Clocks Leading to Altered Uterine Physiology and Reduced Pregnancy Success in Mice. **Photochemical & Photobiological Sciences**. <https://doi.org/10.1007/s43630-022-00210-6>; **IF: 3.982**.
3. Nishtala, Krishnatej, Trailokyanath Panigrahi, Rohit Shetty, **Dhanananajay Kumar**, Pooja Khamar, Rajiv R. Mohan, Vrushali Deshpande, and Arkasubhra Ghosh (2022). Quantitative proteomics reveals molecular network driving stromal cell differentiation: Implications for corneal wound healing. *International Journal of Molecular Sciences* 23(5): 2572. <https://doi.org/10.3390/ijms23052572>; **IF: 5.923**.
4. Raj Naresh Gopal, **Dhanananajay Kumar**, Vinay Kumar Singh, Atanu Kumar Pati and Bechan Lal (2021). Sexual dimorphism in ultradian and 24h rhythms in plasma levels of growth hormone in Indian walking catfish, *Clarias batrachus*. **Chronobiology International**, 38; 320-327. ISSN: 0742-0528 (print), 1525-6073 (electronic); **IF: 3.749**.
5. **Dhanananajay Kumar**, Sanjeev Soni, Noga Kronfeld-Schor and M. Singaravel (2020). Wheel-running activity rhythms and masking responses in the diurnal palm squirrel, *Funambulus pennantii*. **Chronobiology International**. 37 :12; 1693-1708. ISSN: 0742-0528 **IF: 3.749**.
6. Sanjeev Soni, **Dhanananajay Kumar** and M. Singaravel (2020). Phase and differential dose responses of circadian clock to exogenous melatonin in a diurnal rodent, *Funambulus pennantii*. **Chronobiology International**. 37 (5); 641-651. ISSN: 0742-0528 **IF: 3.749**.
7. Rajeev C, **Dhanananajay Kumar**, Pryioneel Basu and Muniyandi Singaravel (2017). Risperidone resets the circadian clock in mice. **Biological Rhythm Research**; 45; 447-454. ISSN: 1744-4179 (Online); **IF: 1.362 (Equal contribution)**.
8. **Dhanananajay Kumar** and Muniyandi Singaravel (2014). Phase and Period Response curve to short light pulses in a wild diurnal rodent, *Funambulus pennanti*. **Chronobiology International**, 31; 320-327. ISSN: 0742-0528 (print), 1525-6073 (electronic); **IF 3.749**.
9. **Dhanananajay Kumar**, Pryioneel Basu and Muniyandi Singaravel (2014). Variations in the rate and direction of re-entrainment to acute simulated jet-lag in the diurnal north Indian palm squirrel. **Biological Rhythm Research**; 45; 447-454. ISSN: 0929-1016 (Print), 1744-4179 (Online); Impact factor: **1.362**
10. Perumal Subramanian, Murugesan Jayakumar, Muniyandi Singaravel, **Dhanananajay Kumar**, Priyoneel Basu, Jaime Jacqueline Jayapalan, Onn Haji Hashimc. (2015). Fisetin, a dietary flavonoid, attenuates hyperammonemia and improves circadian locomotor deficits,

- redox balance, and astrocytic markers in rats. **Journal of Functional Foods** Vol 12; 409–419, 2015, ISSN: 1756-4646; Impact factor: **5.6**
11. Pryioneel Basu, **Dhanananajay Kumar** and Muniyandi Singaravel (2014). Slow and fast orthodromic and antidromic variants in acute 9-h jet-lagged pygmy field mice. **Indian Journal of Experimental Biology**. 52; 1-4. ISSN: 0019-5189 (Print), 0975-1009 (Online); IF: **1.165**.
  12. Rushad Shroff, Rohit Shetty, **Dhanananajay Kumar**, Shivraj Kumar and Arkasubhra Ghosh. (2015). Corneal lenticules as an ex-vivo model to study keratocyte biology. **Acta Ophthalmologica**, Vol 93, Issue Supplement S255, October 2015. IF: **3.032**.
  13. Smilin Bell Aseervatham, J. M. Sasikumar, **Dhanananajay Kumar** (2012). Studies on in vitro free radical scavenging activity of *Bixa orellana* l. Bark extract. **Int J Pharm Pharm Sci**, Vol 4, Issue 2, 719-726: ISSN: 0975-1491; IF: **0.55**.
  14. Luci Kaveri, **Dhanananajay Kumar**, Rohit Shetty and Arkasubhra Ghosh (2016). Smile lenticule as an ex-vivo biological model; (Proceedings); 74th AIOC.
  15. **Dhanananajay Kumar**, Pankaj Paliwal, Sanjeev Kumar Soni, Vivek Kumar, M. Singaravel and Sairam Krishnamurthy (2018). Circadian disruption due to chronic jet-lag/ shift-work cause cognitive deficit in mice; (Proceedings); International Conference on Trends in Biochemical and Biomedical Research: Advances and Challenges.
  16. **Dhanananajay Kumar** and Muniyandi Singaravel (2021). Stability of accuracy and precision in circadian locomotor activity rhythm in diurnal *Funumbulas pennantii*. (**Revision**).
  17. Prabha Rajput, **Dhanananajay Kumar**, Anamika and Sairam Krishnamurthy (2023). Melatonin and N-acetylcysteine ameliorates mitochondrial bioenergetics as a result of chronic dim light induce circadian disruption in mice suprachiasmatic nuclei (**submitted**).
  18. Neeraj Kumar, **Dhanananajay Kumar**, and Sairam Krishnamurthy (2023). Severe hypertension due to chronic exposure to deoxycorticosterone acetate affects the circadian clock and sleep rhythms in rat. (**submitted**).

## BOOK CHAPTERS

1. Deepti Chopra, **Dhanananajay Kumar**, Divya Dubey, Jyoti Singh, Ajeet Kumar Srivastav, and Kailash Chand Gupta (2019). UV-R and Vitamin D Synthesis. In Skin aging & cancer: Ambient UV-R Exposure, Chapter 7; Springer Singapore, Springer Nature Singapore Pte Ltd; ISSN 9811325405.
2. Saroj Kumar Amar, **Dhanananajay Kumar** (2019). Chemiexcitation of Melanin Melanoma Development Long After UVA Exposure, In Skin aging & cancer: Ambient UV-R Exposure, Chapter 8, Springer Singapore, Springer Nature Singapore Pte Ltd; ISSN 9811325405.

**MANSUSCRIPT UNDER COMMUNICATION**

1. **Dhanananajay Kumar** and Muniyandi Singaravel. Short wavelengths of light accelerates rate of re-entrainment to simulated jet-lag shift work in diurnal palm squirrel. *Chronobiology International*.
2. **Dhanananajay Kumar**, Santosh Kumar Patnaik, A R Vijay Kumar, Thirumurthy Velpandian and Muniyandi Singaravel. Short wavelength of light evokes phase shifts and modulates circadian rhythms of plasma melatonin in a diurnal rodent, *Funambulus pennanti*. *Journal of Photobiology and Photochemistry: B*.

**ABSTRACT PUBLISHED IN INTERNATIONAL/NATIONAL SYMPOSIA**

1. International Abstract Published: **15**
2. National Abstract Published: **14**

**MEMBERSHIP OF PROFESSIONAL BODIES**

1. Indian Society for Chronobiology, Life member, date of membership: 01.11.2012.
2. Indian Photobiology Society, Jadavpur, Kolkata, Life member, date of membership: 14.08.2012.

**TRAINING COURSE/WORKSHOP ATTENDED**

1. International school/workshop: **5**
2. National school/workshop: **6**

**PROFESSIONAL TRAINING**

|  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Electroretinogram (ERG) recording in squirrels and rats</li> <li>• Cell culture of isolated cells</li> <li>• Western Blot</li> <li>• Immunohistochemistry</li> <li>• Reverse Transcriptase Reaction (RT-PCR)</li> <li>• Eye and brain dissection in rodents (Squirrel, rat &amp; mice, hamster)</li> <li>• Animal handling (squirrel, rat, mice and hamster)</li> <li>• HPLC, LCMS/MS</li> <li>• Microscopy</li> <li>• Oxytherm (for functioning of ETC complex)</li> </ul> | <ul style="list-style-type: none"> <li>• Chronobiology analysis software (Clock lab, Lafayette Instruments &amp; Cosinor Analysis software)</li> <li>• Real Time PCR (RT-PCR)</li> <li>• Pharmacokinetics</li> <li>• Transcardial perfusion in animals</li> <li>• Statistical software (SPSS 17, Graphpad Prism 6, Statistica 10, Origin 8.1)</li> <li>• Referencing software (Endnote X7)</li> <li>• Machine handling like Cryo-cut, Microtome, Vibrotome.</li> <li>• Behavioral mazes, EEG , ECG recording in rodents</li> <li>• Blood flow in rodents</li> </ul> |
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**PERSONAL STATEMENT**

I have worked as a post-doctoral fellow in recognized national and international research laboratories for nearly 8.6 years in the field of circadian rhythm, metabolism, neuropharmacology and visual neuroscience. During my PhD, I discovered the phase re-setting and electrophysiology characteristic of short wavelengths of light in a

diurnal model, palm squirrel. Thereafter, for my postdoctoral work in GROW laboratory, we established corneal lenticule as an ex-vivo model to study the effect of various drugs during corneal disorders. We looked into the role of various inflammatory and fibrotic markers during corneal wound. Further, we studied quantitative tear proteomics to evaluate biomarkers of inflammation and fibrosis during early onset of corneal disorder and distinct molecular changes during in vitro corneal stromal cell differentiation. At GROW lab and at AIIMS, I got chance to worked with a collaborative team of basic scientists, pharmacologist and veterinary ophthalmologists, toxicologists, and immunologists studying corneal fibrosis, gene therapy, limbal stem cell and vision research projects. I have been actively engaged in circadian rhythm and vision research in collaboration with AIIMS, Narayan Nethralya and IIT BHU, India. I am having experience in the field of **Mammalian Circadian rhythm, Vision Biology, Cognitive Neuroscience, Mitochondrial Bioenergetics & Energy Homeostasis and Corneal Wound healing** and novel therapy development research, and have published 16 peer-reviewed international journal articles and 29 scientific abstracts in National and International conferences, have co-authored book chapters, and received multiple awards from National and International organizations. As a PI I have completed **two grants from funding bodies like DST and SERB, New Delhi**, India. I have also worked on the role of ayurvedic metabolites during dysregulated circadian clock, and decoded circadian rhythm linked interventional approaches to regulate cognition and to reinstate circadian homeostasis. To answers this, we are trying to use chrono-pharmacological and epigenetic approaches to treat various disorders like cognitive deficits, obesity and jet-lag shift work, hypertension etc. I am interested in decoding the mechanisms for circadian disruption induced various metabolic and neurological disorders, and also to design a chrono-pharmacological and eco-friendly lighting schedule approach to alleviate dysregulated clock which ultimately regulate physiological, behavioral metabolic and neurological output in living organisms.

(Dr. Dhanananajay Kumar)