Dr. Lokendra Kumar Sharma (PhD)
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Responsibilities:

- **Patient care services (laboratory):** Biochemical and Molecular Diagnostics
- **Teaching and Training:** Post-graduate and PhD
- **Research:**Mitochondrial Biology of Human Diseases, Cancer, Oxidative stress, Mitochondrial diseases and Aging

Research: Dr. Sharma's laboratory is focused on understanding the mitochondrial mechanisms in human diseases including cancer, aging and mitochondrial disorders. His research work contributed in the understanding the critical role of mitochondrial alterations including changes in complex I functions andfree radical signaling in tumor proliferation and metastasis, and thus tumor mitochondria could be targeted for novel therapeutic interventions. His research also highlighted the rescue approaches for reversing the diseases phenotype through complex I recovery by genetic methods and mitochondrial targeted molecules in cellular and animal models of cancer. Similarly, research on maternally inherited mitochondrial diseases indicated that compromised mitophagy is a major event in inducing mitochondrial defects and may contribute in developing clinical manifestations of these childhood diseases. Activating cellular recycling machinery and clearing damaged mitochondria in these cases could provide a viable approach to restore normal functions and to treat such devastating diseases.

Given the fact that mitochondrial bioenergetics and metabolism are crucial for human health, changes in mitochondrial functionality could be used as reliable early predictive markers for disease progression and can also be used to target mitochondria for developing mitochondrial medicine for treatment regime.Therefore, current research is focused in the following specific areas:

1. Role of mitochondrial alterations and metabolism in carcinogenesis (Breast/glioma/CRC).
2. Development of mitochondrial based predictive markers for disease diagnostics.
3. Targeting mitochondria for developing effective therapeutic approaches.

Funding Support (as Principal Investigator):

1. ICMR-Extramural Research Grant - 2020-2023 (Ongoing).
2. SGPGI Intramural Research Grants- 2019-2021, 2021-2023 (Ongoing)
3. SERB-DST-Core Research Grant- 2019-2022 (Ongoing)
4. DST Young Scientist Grant- 2014-2017- Competed
5. UGC-Start up grant. 2015-2017-Competed

Peer-reviewed Publications (Total=31):
(https://www.ncbi.nlm.nih.gov/myncbi/121H6JIM8fAkR/bibliography/public/)

(Cumulative IF>150,Citations>1500, h-index-17, i10-index-19)

Representative publications (Cancer, aging and neuro-degeneration)

1. Srivastava A, Srivastava P, Mathur S, Abbas S, Rai NK, Tiwari S, Tiwari M, **Sharma LK***.Lipid metabolism and mitochondria: Cross talk in cancer. (Accepted in Current Drug Targets,2021)
2. Rai NK, Panjwani G, Ghosh AK, Haque R, **Sharma LK***, Analysis of mitochondrial DNA copy number variation in blood and tissue samples of metastatic breast cancer patients (A pilot study). Biochemistry and Biophysics Reports 26 (2021) 100931.(*Corresponding Author).
3. Abbas S, Singh SK, Saxena AK, Tiwari S, **Sharma LK*,**Tiwari M*. Role of autophagy in regulation of glioma stem cells population during therapeutic stress. J. Stem Cells & Regenerative Med. 2020 Vol. 16 (2): p80-89. doi:10.46582/jsrm.1602012.(*Corresponding Authors).
4. Rai NK, Mathur S, Singh SK, Tiwari M, Singh VK, Haque R, Tiwari S and Sharma LK: Differential regulation of mitochondrial complex I and oxidative stress based on metastatic potential of colorectal cancer cells. Oncol Lett 20: 313, 2020 (*Corresponding Author).
5. Singh SK, Abbas S, Saxena AK, Tiwari S, **Sharma LK*,**Tiwari M*. Critical role of 3-dimensional tumorspheres size on experimental outcome. Biotechniques. 2020 Oct 1. doi: 10.2144/btn-2020-0081. (*Corresponding Authors).
6. **Sharma LK***, Tiwari M, Rai N, Bai Y*. Mitophagy activation rescues Leber's Hereditary Optic Neuropathy associated mitochondrial dysfunction and improves cell survival (Hum Mol Genet. 2019 Feb 1;28(3):422-433). (*Corresponding Authors).
7. Idowu AJ,**Kumar SL,** Yidong B, Russel R. Melatonin modulates neuronal mitochondria function during normal ageing in mice. Niger J Physiol Sci. 2017 Dec 30;32(2):145-152. (PMID: 29485634).
8. Edmunds LR, Otero PA, **Sharma L**, D'Souza S, Dolezal JM, David S, Lu J, Lamm L, Basantani M, Zhang P, Sipula IJ, Li L, Zeng X, Ding Y, Ding F, Beck ME, Vockley J, Monga SP, Kershaw EE, O'Doherty RM, Kratz LE, Yates NA, Goetzman EP, Scott D, Duncan AW, Prochownik EV. Abnormal Lipid Processing but Normal Long-Term Repopulation Potential of myc-/- Hepatocytes. Oncotarget. 2016 May 24;7(21):30379-95 (PMID: 27105497)(eISSN: 1949-2553).
9. Mishur RJ, Khan M, Munkácsy E, Sharma L, Bokov A, Beam H, Radetskaya O, Borror M, Lane R, Bai Y, Rea SL. Mitochondrial metabolites extend lifespan. Aging Cell. 2016 Apr;15(2):336-48.] (PMID: 26729005) (ISSN: 1474-9726).
10. Tiwari M, **Sharma LK,** Vanegas D, Callaway DA, Bai Y, Lechleiter JD, Herman B. A Non Apoptotic Role For Caspase-2: Modulation of Autophagy. Autophagy. 2014 Jun;10(6):1054-70. doi: 10.4161/auto.28528. PMID:24879153. (eISSN: 1554-8635)