

Manoj Kumar, Ph.D
Assistant Professor
Department of Microbiology and Immunology
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Date March 21, 2023

Contact Information

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Foreign Languages: Hindi (Working knowledge)

Education

1995 - 1998 B.Sc., Biotechnology, Vinoba Bhawe University, Hazaribag, India
1998 - 2002 M.Sc., Biotechnology, Lalit Narayan Mithila University, Darbhanga, India.
2002 - 2009 Ph.D. in Neuroscience, National Brain Research Centre, Gurgaon, Haryana, India.

Post Graduate Education and Training

2009 - 2012 Postdoctoral Fellow, INSERM, U1141, Hopital Robert Debre, 48 Bd Serurier, 75019 Paris, France
2012 - 2019 Postdoctoral Fellow, Institute of Cell Engineering, Johns Hopkins University School of Medicine, Baltimore, MD 21205, USA
2019 – 2021 Postdoctoral Fellow, Department of Microbiology and Immunology University of Maryland School of Medicine, Baltimore, MD 21201

Employment History

Academic Appointments

2021- Present Research Associate, Department of Microbiology and Immunology University of Maryland School of Medicine, Baltimore, MD 21201

Professional Society Memberships

2006-2018: International Society for Stem cell Research (ISSCR)

2017-2018: Member of Sigma Xi

Honors and Awards

2002 Junior Research Fellowship (JRF) Council of Scientific and Industrial Research, Government of India .

2004 Senior Research Fellowship (JRF) Council of Scientific and Industrial Research, Government of India .

2006 New York Stem Cell Foundation (NYSCF) ISSCR Travel Award, Toronto, Ontario.

2007 International Society for Stem Cell Research (ISSCR) Travel Award, Cairns, Australia.

Administrative Service

Institutional Service

2022 **Member, School of Medicine Council**

Local and National Service

Editorial Board Appointment

2018- Present Frontiers in Cellular Neuroscience

Ad Hoc manuscript reviewer of journal

2012 Tumor Biology (1x/year)

2014 - 2018 Plos One (1x/year)

2015 - 2018 Scientific Report (1x/years)

2017 Clinical Proteomics (1x/years)

2018 Journal of Clinical Investigation (1/years)

2018 Frontier of Neuroscience (1x/years)

2018 Stem Cells and Therapy (1x/years)

Teaching Service

I have been involved in teaching and guiding undergraduate and graduate students.

I got an opportunity to share my skills and teach four undergraduate/graduate students in Johns Hopkins (Dawson's Lab). Under my supervision, they learned molecular biology, cell culture skills and knowledge. The list of student with whom I have shared my skill and knowledge in are:

2013-2015 Khadijah Crawford (undergraduate student)

2015-2016 Elena López Ortega (graduate student)

2014-2016 Aanisha Jhaldiyal (Master student)

2015-2018 Jesús Acevedo (Baccalaureate student)

Grant Support

Active Grants:

- 07/01/2021-06/30/2023 (Co-Inv 40%)PI: Ricardo A. Feldman, UMSOM
New Therapeutic Targets for Prevention and Treatment of
GBA1-Associated Parkinson's Disease
Maryland Stem Cells Research Fund
Annual Direct costs: \$ 150,000
Total Direct costs: \$300,000
I am involved in executing experiments and generating data
- 06/01/2022-05/31/2024 (Co-Inv 40%)PI: Ricardo A. Feldman, UMSOM
The role of acid ceramidase in GBA1-associated PD
The Michael J. Fox Foundation for Parkinson's Research
Annual Direct costs: \$ 130,000
Total Direct costs: 260,000
I am involved in executing experiments and generating data

Completed Awards:

- 2014-2016 (Post-doctoral fellowship, 100%)
Human dopaminergic neuronal loss due to Parkin
insufficiency: Relevance to Parkinson's disease
Maryland Stem Cells Research Fund
Annual Direct costs: \$ 55,000
Total Direct costs: 110,000

Peer-reviewed journal articles

1. Bagchi B, **Kumar M**, Mani S. *CMV promotor activity during ES cell differentiation: potential insight into embryonic stem cell differentiation*. Cell Biol Int. 2006 Jun;30(6):505-13.
2. **Kumar M**, Bagchi B, Gupta SK, Meena AS, Gressens P, Mani S. *Neurospheres derived from human embryoid bodies treated with retinoic Acid show an increase in nestin and ngn2 expression that correlates with the proportion of tyrosine hydroxylase-positive cells*. Stem Cells Dev. 2007 Aug;16(4):667-81.
3. **Kumar M**, Kaushalya SK, Gressens P, Maiti S, Mani S. *Optimized derivation and functional characterization of 5-HT neurons from human embryonic stem cells*. Stem Cells Dev. 2009 May;18(4):615-27.
4. Dupuis N, Lebon S, **Kumar M**, Drunat S, Graul-Neumann LM, Gressens P, El Ghouzzi V. *A novel RAB33B mutation in Smith-McCort dysplasia*. Hum Mutat. 2013 Feb;34(2):283-6.
5. Srivastava R, **Kumar M**, Peineau S, Csaba Z, Mani S, Gressens P, El Ghouzzi V. *Conditional induction of Math1 specifies embryonic stem cells to cerebellar granule neuron lineage and promotes differentiation into mature granule neurons*. Stem Cells. 2013 Apr;31(4):652-65.
6. Martin I, Kim JW, Lee BD, Kang HC, Xu JC, Jia H, Stankowski J, Kim MS, Zhong J, **Kumar M**, Andrabi SA, Xiong Y, Dickson DW, Wszolek ZK, Pandey A, Dawson TM, Dawson VL. *Ribosomal protein s15 phosphorylation mediates LRRK2 neurodegeneration in Parkinson's disease*. Cell. 2014 Apr 10;157(2):472-485.
7. **Kumar M**, Csaba Z, Peineau S, Srivastava R, Rasika S, Mani S, Gressens P, El Ghouzzi V. *Endogenous cerebellar neurogenesis in adult mice with progressive ataxia*. Ann Clin Transl Neurol. 2014 Dec;1(12):968-81.

8. Dupuis N, Fafouri A, Bayot A, **Kumar M**, Lecharpentier T, Ball G, Edwards D, Bernard V, Dournaud P, Drunat S, Vermelle-Andrzejewski M, Vilain C, Abramowicz M, Désir J, Bonaventure J, Gareil N, Boncompain G, Csaba Z, Perez F, Passemard S, Gressens P, El Ghouzzi V. *Dymeclin deficiency causes postnatal microcephaly, hypomyelination and reticulum-to-Golgi trafficking defects in mice and humans*. Hum Mol Genet. 2015 May 15;24(10):2771-83.
9. Brahmachari S, Ge P, Lee SH, Kim D, Karuppagounder SS, **Kumar M**, Mao X, Shin JH, Lee Y, Pletnikova O, Troncoso JC, Dawson VL, Dawson TM, Ko HS. *Activation of tyrosine kinase c-Abl contributes to α -synuclein-induced neurodegeneration*. J Clin Invest. 2016 Aug 1;126(8):2970-88.
10. Karuppagounder SS, Xiong Y, Lee Y, Lawless MC, Kim D, Nordquist E, Martin I, Ge P, Brahmachari S, Jhaldiyal A, **Kumar M**, Andrabi SA, Dawson TM, Dawson VL. *LRRK2 G2019S transgenic mice display increased susceptibility to 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)-mediated neurotoxicity*. J Chem Neuroanat. 2016 Oct;76(Pt B):90-97.
11. Liddel SA, Guttenplan KA, Clarke LE, Bennett FC, Bohlen CJ, Schirmer L, Bennett ML, Münch AE, Chung WS, Peterson TC, Wilton DK, Frouin A, Napier BA, Panicker N, **Kumar M**, Buckwalter MS, Rowitch DH, Dawson VL, Dawson TM, Stevens B, Barres BA. *Neurotoxic reactive astrocytes are induced by activated microglia*. Nature. 2017 Jan 26;541(7638):481-487.
12. McCall MN, Kim MS, Adil M, Patil AH, Lu Y, Mitchell CJ, Leal-Rojas P, Xu J, **Kumar M**, Dawson VL, Dawson TM, Baras AS, Rosenberg AZ, Arking DE, Burns KH, Pandey A, Halushka MK. *Toward the human cellular microRNAome*. Genome Res. 2017 Oct;27(10):1769-1781.
13. Yun SP, Kam TI, Panicker N, Kim S, Oh Y, Park JS, Kwon SH, Park YJ, Karuppagounder SS, Park H, Kim S, Oh N, Kim NA, Lee S, Brahmachari S, Mao X, Lee JH, **Kumar M**, An D, Kang SU, Lee Y, Lee KC, Na DH, Kim D, Lee SH, Roschke VV, Liddel SA, Mari Z, Barres BA, Dawson VL, Lee S, Dawson TM, Ko HS. *Block of A1 astrocyte conversion by microglia is neuroprotective in models of Parkinson's disease*. Nat Med. 2018 Jul;24(7):931-938.
14. Brahmachari S, Lee S, Kim S, Yuan C, Karuppagounder SS, Ge P, Shi R, Kim EJ, Liu A, Kim D, Quintin S, Jiang H, **Kumar M**, Yun SP, Kam TI, Mao X, Lee Y, Swing DA, Tessarollo L, Ko HS, Dawson VL, Dawson TM. *Parkin interacting substrate zinc finger protein 746 is a pathological mediator in Parkinson's disease*. Brain. 2019 Aug 1;142(8):2380-2401.
15. **Kumar M**, Acevedo-Cintrón J, Jhaldiyal A, Wang H, Andrabi SA, Eacker S, Karuppagounder SS, Brahmachari S, Chen R, Kim H, Ko HS, Dawson VL, Dawson TM. *Defects in Mitochondrial Biogenesis Drive Mitochondrial Alterations in PARKIN-Deficient Human Dopamine Neurons*. Stem Cell Reports. 2020 Sep 8;15(3):629-645.
16. Kim JW, Yin X, Jhaldiyal A, Khan MR, Martin I, Xie Z, Perez-Rosello T, **Kumar M**, Abalde-Atristain L, Xu J, Chen L, Eacker SM, Surmeier DJ, Ingolia NT, Dawson TM, Dawson VL. *Defects in mRNA Translation in LRRK2-Mutant hiPSC-Derived Dopaminergic Neurons Lead to Dysregulated Calcium Homeostasis*. Cell Stem Cell. 2020 Oct 1;27(4):633-645
17. Jo A, Lee Y, Kam TI, Kang SU, Neifert S, Karuppagounder SS, Khang R, Kang H, Park H, Chou SC, Oh S, Jiang H, Swing DA, Ham S, Pirooznia S, Umanah GKE, Mao X, **Kumar M**, Ko HS, Kang HC, Lee BD, Lee YI, Andrabi SA, Park CH, Lee JY, Kim H, Kim H, Kim H, Cho JW, Paek SH, Na CH, Tessarollo L, Dawson VL, Dawson TM, Shin JH. *PARIS farnesylation prevents neurodegeneration in models of Parkinson's disease*. Sci Transl Med. 2021 Jul 28;13(604):eaax8891.

18. Pirooznia SK, Wang H, Panicker N, **Kumar M**, Neifert S, Dar MA, Lau E, Kang BG, Redding-Ochoa J, Troncoso JC, Dawson VL, Dawson TM. Deubiquitinase *CYLD* acts as a negative regulator of dopamine neuron survival in Parkinson's disease. *Sci Adv.* 2022 Apr;8(13):eabh1824.
19. Panicker N, Kam TI, Wang H, Neifert S, Chou SC, **Kumar M**, Brahmachari S, Jhaldiyal A, Hinkle JT, Akkentli F, Mao X, Xu E, Karuppagounder SS, Hsu ET, Kang SU, Pletnikova O, Troncoso J, Dawson VL, Dawson TM. *Neuronal NLRP3 is a parkin substrate that drives neurodegeneration in Parkinson's disease.* *Neuron.* 2022 Aug 3;110(15):2422-2437.e9
20. Karuppagounder SS, Wang H, Kelly T, Rush R, Nguyen R, Bisen S, Yamashita Y, Sloan N, Dang B, Sigmon A, Lee HW, Marino Lee S, Watkins L, Kim E, Brahmachari S, **Kumar M**, Werner MH, Dawson TM, Dawson VL. The c-Abl inhibitor IKT-148009 suppresses neurodegeneration in mouse models of heritable and sporadic Parkinson's disease. *Sci Transl Med.* 2023 Jan 18;15(679):eabp9352. doi: 10.1126/scitranslmed.abp9352. Epub 2023 Jan 18.
21. **Kumar M**, Srikanth MP, Deleidi M, Hallett PJ, Isacson O, Feldman RA. Acid ceramidase involved in pathogenic cascade leading to accumulation of α -synuclein in iPSC model of GBA1-associated Parkinson's disease. *Hum Mol Genet.* 2023 Feb 8;ddad025. doi: 10.1093/hmg/ddad025.

Major Invited Speeches

National

1. **Kumar M**, Eacker S, Andrabi S, Dawson VL & Dawson TM: Generation of Isogenic Parkin and Control Pluripotent Stem Cells, The 7th Annual Maryland Stem Cell Research Symposium, Silver Spring, Maryland, USA, December 2014.

International

1. **Kumar M**, Acevedo-Cintrón J, Jhaldiyal A, Wang H, Andrabi SA, Eacker S, Karuppagounder SS, Brahmachari S, Chen R, Kim H, Ko HS, Dawson VL, Dawson TM: Mitochondrial defects in Parkinson's disease, Centre for Stem Cell Research, CMC, Vellore, India, September 2017.
2. **Kumar M**, Acevedo-Cintrón J, Jhaldiyal A, Wang H, Andrabi SA, Eacker S, Karuppagounder SS, Brahmachari S, Chen R, Kim H, Ko HS, Dawson VL, Dawson TM: Mitochondrial defects in Parkinson's disease, Department of Biochemistry, University of Delhi, South campus, India, October 2017.