

Satish Kumar, Ph.D.

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Education & Training

- 2003 Doctor of Philosophy [Ph.D.]
Department of Anthropology, University of Delhi, Delhi
Dissertation: "Genetic Structure of the Scheduled Tribes of Rajasthan"
- 1996 Masters of Science [M.Sc.]
Anthropology, Specialization Physical/Biological Anthropology
Department of Anthropology, University of Delhi, Delhi
- 1994 Bachelors of Science [B.Sc.]
Botany (Honours), Zoology and Chemistry
University of Delhi, Delhi

Research Focus

Dr. Kumar's research focuses on the development and application of induced pluripotent stem cell (iPSC) based methodologies and cell models to identify genetic and environmental determinants of human disease risk. He has developed an efficient iPSC reprogramming methodology for cryopreserved lymphoblastoid (immortalized B lymphocytes) cell lines (LCLs). This cost effective and highly successful reprogramming methodology has potential to have a huge impact in the field because numerous sample repositories worldwide have banked LCLs that could be used for iPSC generation. Dr. Kumar's laboratory has generated more than 300 validated iPSC lines using one such LCLs repository maintained at the Department of Human Genetics and STDIOI for its longitudinal Mexican American Family Study. The generated iPSCs and the protocols that Dr. Kumar has developed are being used in in-vitro modeling of disease related phenotypes in genetic studies of neurodegenerative and neuropsychiatric disorders, metabolic disorders including type 2 diabetes, cardiovascular disease, obesity, and fatty liver disease and more recently in understanding individual variation in cellular response to SARS-CoV-2 infection.

In a recent NIH funded project, Dr. Kumar has developed iPSC reprogramming and differentiation methodologies for *Monodelphis domestica*. The generated iPSCs are the first integration free and the second ever reprogrammed from a marsupial species. *M. domestica* is a well-established laboratory animal that is used as an experimental model in many basic, comparative, and biomedical research applications.

Apart from his current endeavor in developing iPSC methodology, Dr. Kumar has had major role in several large-scale, NIH and industry funded, human genetics projects, aimed at identifying genes influencing human complex diseases. He also has a strong interest in human phylogenetics, mitochondrial DNA variation and mitochondrial retrograde regulation - a process that is likely to have far-reaching implications in development, aging, disease, and environmental adaptation.

Publications

Original publications in peer-reviewed Journals

Kumar S, Kushwaha KPS, Rao MB, Bhasin MK (1999). Serogenetic characterization of the Bhil Tribe of Rajasthan. *The Anthropologist.*, 1(1): 57-60. *Free article: <http://krepublishers.com/02-Journals/T-Anth/Anth-01-0-000-000-1999-Web/ANTH-01-01-001-99-Abst-PDF/ANTH-01-01-057-99-Text.pdf>*

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Saviour P, **Kumar S**, Kiran U, Ravuri RR, Rao VR, Ramachandra NB (2008). Allelic variants of *DYX1C1* are not associated with dyslexia in India. *Indian J. Hum. Genet.*, 14(3):99-102. Epub 2008/09/01. doi: 10.4103/0971-6866.45002. PubMed PMID: 20300304; PMCID: PMC2840802.

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South Asian corridor. PLoS One., 4(10):e7447. Epub 2009/10/14. doi:

10.1371/journal.pone.0007447. PubMed PMID: 19823670; PMCID: PMC2757894.

Gupta V, Khadgawat R, Ng HK, **Kumar S**, Aggarwal A, Rao VR, Sachdeva MP (2010). A validation study of type 2 diabetes-related variants of the TCF7L2, HHEX, KCNJ11, and ADIPOQ genes in one endogamous ethnic group of north India. *Ann. Hum. Genet.*, 74(4):361-8. Epub 2010/07/06. doi: 10.1111/j.1469-1809.2010.00580.x. PubMed PMID: 20597906.

Gupta V, Khadgawat R, Ng HK, **Kumar S**, Rao VR, Sachdeva MP (2010). Population structure of Aggarwals of north India as revealed by molecular markers. *Genet. Test Mol. Biomarkers.*, 14(6):781-5. Epub 2010/10/29. doi: 10.1089/gtmb.2010.0095. PubMed PMID: 20979565; PMCID: PMC3490109.

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Gopi Chand M, Srinath J, Rao RS, Lakkakula BV, **Kumar S**, Rao VR (2011). Association between the M268T polymorphism in the angiotensinogen gene and essential hypertension in a South Indian population. *Biochem. Genet.*, 49(7-8):474-82. Epub 2011/02/12. doi: 10.1007/s10528-011-9423-y. PubMed PMID: 21312059.

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