CURRICULUM VITAE

Name	: **Dr. SANJEEV KUMAR** **Ph.D., MRSB**
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Current Position	: Assistant Professor
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RESEARCH SUMMARY

Dr. Sanjeev Kumar is a B-cell and systems immunologist with extensive experience in basic and translational research. His multidisciplinary research integrates B-cell immunology, single-cell and immune repertoire profiling, virology, structural biology, and vaccine science to understand the humoral, cellular, and molecular basis of human antiviral immunity, with particular emphasis on antibody evolution, breadth, protection, and antibody-mediated pathogenesis.

He has established a high-throughput scRNA-seq and single-B-cell cloning-based antibody discovery and characterization platform, through which he has discovered and characterized 400+ human monoclonal antibodies against HIV-1, Coronaviruses (SARS-CoV-2), Flaviviruses (Dengue, Zika, West Nile), and Influenza viruses. His work has contributed to multiple patent filings and high-impact peer-reviewed publications and has rationally designed subunit, nucleic acid, and self-assembled protein nanoparticle-based vaccine antigens.

His emerging research program applies multidisciplinary systems immunology platforms to understand how humoral, cellular, immune repertoires, viral factors, and antibody properties interact to shape protective and pathogenic immune responses. By integrating single-cell transcriptomics, BCR sequencing, CITE-seq, immune profiling, functional antibody assays, viral genomics, computational analysis, and structural biology, he aims to establish predictive principles of protective human antibody responses and translate them into next-generation vaccines and antibody therapeutics for emerging and re-emerging viruses.

He has extensive experience mentoring PhD, MBBS, and MD trainees, recruiting and training research personnel, and building collaborative multidisciplinary research programs.

RESEARCH INTERESTS & EXPERTISE

Molecular B-cell Immunology, Systems Immunology of Viral Infections, Antibody Discovery, Antibody and Protein Engineering, Vaccine Design, Neutralizing Antibodies, Infectious Diseases, Reverse Vaccinology 2.0, Translational Research, Single-cell Omics

EDUCATION

Doctor of Philosophy (PhD) in Biochemistry | AIIMS, New Delhi, India | August 2014 – September 2019

- *Thesis/Dissertation: Discovery of Fully Human Monoclonal Antibodies Using High-Throughput Antigen-Specific Single B-Cell Technology from HIV-1 Infected Children.*
  Supervisor: Prof. Kalpana Luthra

Master of Science (MSc) in Biochemistry | AIIMS, New Delhi, India | August 2012 – July 2014

- *Thesis/Dissertation: Generation and characterization of human recombinant single chain variable fragments (scFv) against envelope glycoprotein of subtype-C HIV-1 from pediatric patients.*
  Supervisor: Prof. Kalpana Luthra

Bachelor of Science (BSc) in Biochemistry | University of Delhi, India | September 2009 – May 2012

ACADEMIC APPOINTMENTS

Assistant Professor | Department of Biochemistry | AIIMS, New Delhi, India | July 2026 – Present

Assistant Professor / Group Leader | ICGEB-Emory Vaccine Program | ICGEB, New Delhi, India | November 2025 – July 2026.

Visiting Postdoctoral Fellow | Dr. Jens Wrammert Lab | Department of Pediatrics, Division of Infectious Diseases, Emory Vaccine Center, Emory University, Atlanta, GA, USA | September 2022 – October 2025.

DBT – Wellcome Trust India Alliance Early Career Fellow | ICGEB-Emory Vaccine Center | ICGEB, New Delhi, India | January 2020 – December 2024.

Research Associate | ICGEB-Emory Vaccine Center | ICGEB, New Delhi, India | November 2019 – December 2019.

HIV Research Trust Scholar | Dr. Dennis Burton and Dr. Bryan Briney lab | The Scripps Research Institute, La Jolla, California, USA | July 2019 – August 2019.

EMBO Fellow | Dr. Rogier W. Sanders lab | UMC, Amsterdam, The Netherlands | October 2018 – December 2018.

PUBLICATIONS

1. **Kumar S***, Scott CAP, Xu L, Moore K, Velden JV, Shih S, West RH, Gupta SL, Modhiran N, Suthar MS, Watterson D, Wrammert J. IgG3 Hinge Architecture Expands Dengue Virus Breadth of A Quaternary Epitope Dependent Zika Virus Cross-Neutralizing Antibody. ***bioRxiv [Preprint]***. 2026, Under Revision. https://doi.org/10.64898/2026.03.17.712406 **(*Co-corresponding author)**.
2. Leach A, Xu L, Malakar S, Pacenti M, Vogiatzis S, **Kumar S**, Vander Velden J, Wang M, Kendzel M, Zarnitsyna V, Hui S, Nguyen M, Nelson C, Ferrell T, Neufeldt C, Fremont D, Menachery V, Busch M, Norris P, Lanteri M, Barzon L, Wrammert J, Suthar M. Longitudinal dynamics and lineage cross-reactivity of the human antibody response to West Nile virus. ***mBio***. 2026, In-press.
3. **Kumar S**, Lai L, Ellis ML, Patel A, Joshi D, Velden JV, Faraj JZA, Wimalasena ST, Pallavi RR, Iriss J, Bechnak K, Edupuganti S, Rouphael N, Ortlund EA, Moreno A, Menachery VD, Zarnitsyna VI, Wrammert J, Suthar MS. Immunological imprinting shapes the cross-reactive antibody responses to the KP.2 and LP.8.1 vaccine doses. ***Journal of Virology*****.** 2026, In-press.
4. Gautam, S., Singh, S., Thakkar, V., Joshi, D., & **Kumar, S**. Human Antibody Isotypes, Subclasses, Allotypes and Fc Biology: Clinical Implications in Infectious Diseases, Autoimmunity, and Cancer. ***Pharmaceuticals***, (2026) 19(8), 1290. https://doi.org/10.3390/ph19081290
5. Singh, S., Gautam, S., Thakkar, V., **Kumar, S.***, & Joshi, D. Viral Vaccine Adjuvant Strategies for Shaping Durable Immunity Across the Human Lifespan. ***Vaccines,*** (2026) 14(6), 508. https://doi.org/10.3390/vaccines14060508 **(*Co-corresponding author)**.
6. Dixit K, Nayak K, Saini MK, Qamar S, Bajpai P, Reddy ES, Ameer S, Dhar Dubey V, Pervez M, Kohli S, Gottimukkala K, Gupta S, Khan N, Maheshwari D, Akhtar NSM, Chawla YM, Rai RC, Sagar R, Islamuddin M,

Khan WH, Mishra N, Patel AK, Sunil S, Lodha R, Jain V, Ray P, Murali-Krishna K, Saini K, **Kumar S*** and Chandele A. Shared germline-biased plasmablast clonotypes shape early neutralizing antibody responses during acute Chikungunya virus infection. ***Frontiers in Immunology***. 2026 17:1846926. https://doi.org/10.3389/fimmu.2026.1846926 **(*Co-corresponding author)**.

7. Singh S, **Kumar S**, and Kalpana Luthra. Recent Advances in HIV-1 Envelope Based Vaccine Designs for Guiding Broadly Neutralizing Antibody Response. ***Journal of Virology*****.** 2026 100:e02202-25. https://doi.org/10.1128/jvi.02202-25 (**Co-First author/Equal Contribution**).

8. **Kumar S**, Jain S, Wali B, Zarnitsyna V, Joshi D, Ellis ML, Lai L, Malik AA, Mcpherson TO, Godbole S, Patel A, Linderman S, Solis D, Sahoo MK, Bechnak K, Paredes I, Tanios R, Kazzi B, Dib SM, Litvack MB, Wimalasena ST, Ciric C, Rostad C, West RH, Teng IT, Wang D, Ortlund EA, Menachery VD, Edupuganti S, Kwong PD, Rouphael N, Pinsky BA, Douek DC, Moreno A, Wrammert J, Suthar MS. The XBB.1.5 COVID-19 vaccine elicits a durable antibody response to ancestral and XBB.1.5 SARS-CoV-2 spike proteins. ***Science Translational Medicine***. 2025 Sep 3;17(814):eadu8067. https://www.science.org/doi/10.1126/scitranslmed.adu8067

9. **Kumar, S.,** Del Moral Sanchez, I., Singh, S., Newby, M. L., Allen, J. D., Bijl, T. P. L., Vaghani, Y., Jing, L., Lodha, R., Ortlund, E. A., Crispin, M., Patel, A., Sanders, R. W., & Luthra, K. (2025). The design and immunogenicity of an HIV-1 clade C pediatric envelope glycoprotein stabilized by multiple platforms. ***Vaccines,*** 13(2), 110. https://doi.org/10.3390/vaccines13020110

10. Del Moral Sanchez, I., Wee, E. G., Lee, W. H., Allen, J. D., Torrents de la Peña, A., Rocha, R. F., Ferguson, J., Leon, A. N., Koekkoek, S., Schermer, E. E., Burger, J. A., **Kumar, S.,** Zwolsman, R., Brinkkemper, M., Aartse, A., Eggink, D., Han, J., Crispin, M., Ozorowski, G., ... Sanders, R. W. (2024). Triple tandem trimer immunogens for HIV-1 and influenza nucleic acid-based vaccines. ***NPJ Vaccines,*** 9, 74. https://doi.org/10.1038/s41541-024-00862-8

11. **Kumar, S.,** Bajpai, P., Joyce, C., Kabra, S. K., Lodha, R., Burton, D. R., Briney, B., & Luthra, K. (2024). B cell repertoire sequencing of HIV-1 pediatric elite-neutralizers identifies multiple broadly neutralizing antibody clonotypes. ***Frontiers in Immunology,*** 15, 1272493. https://doi.org/10.3389/fimmu.2024.1272493

12. Aggarwal, C., Ahmed, H., Sharma, P., Reddy, E. S., Nayak, K., Singla, M., Maheshwari, D., Chawla, Y. M., Panda, H., Rai, R. C., Gunisetty, S., Priyamvada, L., Bhaumik, S. K., Ahamed, S. F., Vivek, R., Bhatnagar, P., Singh, P., Kaur, M., Dixit, K., **Kumar, S.,** ... Kaja, M. K. (2024). Severe disease during both primary and secondary dengue virus infections in pediatric populations. ***Nature Medicine***, 30(3), 670–674. https://doi.org/10.1038/s41591-024-02798-x

13. Patel, A., **Kumar, S.,** Lai, L., Keen, M., Valanparambil, R., Chakravarthy, C., Laughlin, Z., Frank, F., Cheedarla, N., Verkerke, H. P., Neish, A. S., Roback, J. D., Davis, C. W., Wrammert, J., Sharma, A., Ahmed, R., Suthar, M. S., Murali-Krishna, K., Chandele, A., & Ortlund, E. A. (2023). Light chain of a public SARS-CoV-2 class-3 antibody modulates neutralization against Omicron. ***Cell Reports***, 42(9), 113150. https://doi.org/10.1016/j.celrep.2023.113150. (***Equal contribution/co-first author***)

14. **Kumar, S.,** Singh, S., Chatterjee, A., Bajpai, P., Sharma, S., Katpara, S., Lodha, R., Dutta, S., & Luthra, K. (2023). Recognition determinants of broad and potent HIV-1 neutralization by an affinity matured antibody from a pediatric elite-neutralizer. ***iScience,*** 26(9), 107579. https://doi.org/10.1016/j.isci.2023.107579

15. Gautam, S., Kumar, R., Kumar, U., **Kumar, S.,** Luthra, K., & Dada, R. (2023). Yoga maintains Th17/Treg cell homeostasis and reduces the rate of T-cell aging in rheumatoid arthritis: A randomized controlled trial. ***Scientific Reports,*** 13(1), 14924. https://doi.org/10.1038/s41598-023-42231-w

16. Patel, A., **Kumar, S.,** Lai, L., Chakravarthy, C., Valanparambil, R., Reddy, E. S., Gottimukkala, K., Bajpai, P., Raju, D. R., Edara, V. V., Davis-Gardner, M. E., Linderman, S., Dixit, K., Sharma, P., Mantus, G., Cheedarla, N., Verkerke, H. P., Frank, F., Neish, A. S., ... Ortlund, E. A. (2023). Molecular basis of SARS-CoV-2 Omicron variant evasion from shared neutralizing antibody response. ***Structure,*** 31(7), 801–811.e5. https://doi.org/10.1016/j.str.2023.04.010. (***Equal contribution/co-first author***)

17. **Kumar, S.,** Singh, S., & Luthra, K. (2023). An overview of human anti-HIV-1 neutralizing antibodies against diverse epitopes of HIV-1. ***ACS Omega,*** 8(8), 7252–7261. https://doi.org/10.1021/acsomega.2c07933

18. Parray, H. A., Narayanan, N., Garg, S., Rizvi, Z. A., Shrivastava, T., Kushwaha, S., Singh, J., Murugavelu, P., Anantharaj, A., Mehdi, F., Raj, N., Singh, S., Dandotiya, J., Lukose, A., Jamwal, D., Kumar, S., Chiranjivi, A., Dhyani, S., Mishra, N., **Kumar, S.,** ... Kumar, R. (2022). A broadly neutralizing monoclonal antibody overcomes the mutational landscape of emerging SARS-CoV-2 variants of concern. ***PLoS Pathogens*****,** 18(12), e1010994. https://doi.org/10.1371/journal.ppat.1010994

19. Chaturvedi, R., Mohan, M., **Kumar, S.,** Chandele, A., & Sharma, A. (2022). Profiles of host immune impairment in Plasmodium and SARS-CoV-2 infections. ***Heliyon*****,** 8, e11744. https://doi.org/10.1016/j.heliyon.2022.e11744

20. Chakraborti, S., Gill, J., Goswami, R., **Kumar, S.,** Chandele, A., & Sharma, A. (2022). Structural profiles of SARS-CoV-2 variants in India. ***Current Microbiology***, 80(1), Article 1. https://doi.org/10.1007/s00284-022-03094-y

21. **Kumar, S.,** Patel, A., Lai, L., Chakravarthy, C., Valanparambil, R., Davis-Gardner, M. E., Edara, V. V., Linderman, S., Reddy, E. S., Gottimukkala, K., Nayak, K., Bajpai, P., Singh, V., Frank, F., Cheedarla, N., Verkerke, H. P., Neish, A. S., Roback, J. D., Mantus, G., ... Chandele, A. (2022). Structural insights for neutralization of BA.1 and BA.2 Omicron variants by a broadly neutralizing SARS-CoV-2 antibody. ***Science Advances*****,** 8(40), eadd2032. https://doi.org/10.1126/sciadv.add2032

22. Bajpai, P., Singh, V., Chandele, A., & **Kumar, S.** (2022). Broadly neutralizing antibodies to SARS-CoV-2 provide novel insights into the neutralization of variants and other human coronaviruses. ***Frontiers in Cellular and Infection Microbiology***, 12, 928279. https://doi.org/10.3389/fcimb.2022.928279. (***Corresponding author***)

23. Del Moral-Sanchez, I., Russell, R. A., Schermer, E. E., Cottrell, C. A., Allen, J. D., Torrents de la Peña, A., LaBranche, C. C., **Kumar, S.,** Crispin, M., Ward, A. B., Montefiori, D. C., Sattentau, Q. J., Sliepen, K., & Sanders, R. W. (2022). High thermostability improves neutralizing antibody responses induced by native-like HIV-1 envelope trimers. ***NPJ Vaccines*****,** 7(1), 27. https://doi.org/10.1038/s41541-022-00446-4

24. Mishra, N., **Kumar, S.,** Singh, S., Bansal, T., Jain, N., Saluja, S., Kumar, R., Bhattacharyya, S., Palanichamy, J. K., Mir, R. A., Sinha, S., & Luthra, K. (2021). Cross-neutralization of SARS-CoV-2 by HIV-1 specific broadly neutralizing antibodies and polyclonal plasma. ***PLoS Pathogens*****,** 17(9), e1009958. https://doi.org/10.1371/journal.ppat.1009958

25. Aggarwal, C., Saini, K., Reddy, E. S., Singla, M., Nayak, K., Chawla, Y. M., Maheshwari, D., Singh, P., Sharma, P., Bhatnagar, P., **Kumar, S.,** Gottimukkala, K., Panda, H., Gunisetty, S., Davis, C. W., Kissick, H. T., Kabra, S. K., Lodha, R., Medigeshi, G. R., ... Chandele, A. (2021). Immunophenotyping and transcriptional profiling of human plasmablasts in dengue. ***Journal of Virology*****,** 95(23), e0061021. https://doi.org/10.1128/JVI.00610-21

26. **Kumar, S.,** Chandele, A., & Sharma, A. (2021). Current status of therapeutic monoclonal antibodies against SARS-CoV-2. ***PLoS Pathogens*****,** 17(9), e1009885. https://doi.org/10.1371/journal.ppat.1009885

27. Nayak, K., Gottimukkala, K., **Kumar, S.,** Reddy, E. S., Edara, V. V., Kauffman, R., Floyd, K., Mantus, G., Savargaonkar, D., Goel, P. K., Arora, S., Rahi, M., Davis, C. W., Linderman, S., Wrammert, J., Suthar, M. S., Ahmed, R., Sharma, A., Murali-Krishna, K., & Chandele, A. (2021). Characterization of neutralizing versus binding antibodies and memory B cells in COVID-19 recovered individuals from India. ***Virology*****,** 558, 13–21. https://doi.org/10.1016/j.virol.2021.02.002. (***Equal contribution/co-first author***)

28. **Kumar, S.,** Batra, H., Singh, S., Chawla, H., Singh, R., Katpara, S., Hussain, A. W., Das, B. K., Lodha, R., Kabra, S. K., & Luthra, K. (2020). Effect of combination antiretroviral therapy on HIV-1-specific antibody responses in subtype-C infected children. ***Journal of General Virology***, 101(12), 1289–1299. https://doi.org/10.1099/jgv.0.001480

29. Mishra, N., Sharma, S., Dobhal, A, **Kumar, S.,** Chawla, H., Singh, R., Makhdoomi, M. A., Das, B. K., Lodha, R., Kabra, S. K., & Luthra, K. (2020). Broadly neutralizing plasma antibodies effective against autologous circulating viruses in infants with multivariant HIV-1 infection. ***Nature Communications***, 11(1), 4409. https://doi.org/10.1038/s41467-020-18225-x

30. Mishra, N., Makhdoomi, M. A., Sharma, S., **Kumar, S.,** Dobhal, A., Kumar, D., Chawla, H., Singh, R., Kanga, U., Das, B. K., Lodha, R., Kabra, S. K., & Luthra, K. (2020). A rare mutation in an infant-derived HIV-1 envelope glycoprotein alters interprotomer stability and susceptibility to broadly neutralizing antibodies targeting the trimer apex. ***Journal of Virology***, 94(19), e00814-20. https://doi.org/10.1128/JVI.00814-20

31. Mishra, N., Makhdoomi, M. A., Sharma, S., **Kumar, S.,** Dobhal, A., Kumar, D., Chawla, H., Singh, R., Das, B. K., Lodha, R., Kabra, S. K., & Luthra, K. (2019). Viral characteristics associated with maintenance of elite neutralizing activity in chronically HIV-1 clade C-infected monozygotic pediatric twins. ***Journal of Virology*****,** 93(17), e00654-19. https://doi.org/10.1128/JVI.00654-19

32. **Kumar, S.,** Panda, H., Makhdoomi, M. A., Mishra, N., Safdari, H. A., Chawla, H., Aggarwal, H., Reddy, E. S., Lodha, R., Kabra, S. K., Chandele, A., Dutta, S., & Luthra, K. (2019). An HIV-1 broadly neutralizing antibody from a clade C-infected pediatric elite neutralizer potently neutralizes the contemporaneous and autologous evolving viruses. ***Journal of Virology***, 93(4), e01495-18. https://doi.org/10.1128/JVI.01495-18

33. Aggarwal, H., Khan, L., Chaudhary, O., **Kumar, S.,** Makhdoomi, M. A., Singh, R., Sharma, K., Mishra, N., Lodha, R., Srinivas, M., Das, B. K., Kabra, S. K., & Luthra, K. (2017). Alterations in B-cell compartment correlate with poor neutralization response and disease progression in HIV-1-infected children. ***Frontiers in Immunology***, 8, 1697. https://doi.org/10.3389/fimmu.2017.01697

34. **Kumar, S.,** Kumar, R., Khan, L., Makhdoomi, M. A., Thiruvengadam, R., Mohata, M., Agarwal, M., Lodha, R., Kabra, S. K., Sinha, S., & Luthra, K. (2017). CD4-binding site directed cross-neutralizing scFv monoclonals from HIV-1 subtype C infected Indian children. ***Frontiers in Immunology***, 8, 1568. https://doi.org/10.3389/fimmu.2017.01568

35. Makhdoomi, M. A., Khan, L., **Kumar, S.,** Aggarwal, H., Singh, R., Lodha, R., Singla, M., Das, B. K., Kabra, S. K., & Luthra, K. (2017). Evolution of cross-neutralizing antibodies and mapping epitope specificity in plasma of chronic HIV-1-infected antiretroviral therapy-naïve children from India. ***Journal of General Virology***, 98(7), 1879–1891. https://doi.org/10.1099/jgv.0.000824

36. Khan, L., Kumar, R., Thiruvengadam, R., Parray, H. A., Makhdoomi, M. A., **Kumar, S.,** Aggarwal, H., Mohata, M., Hussain, A. W., Das, R., Varadarajan, R., Bhattacharya, J., Vajpayee, M., Murugavel, K. G., Solomon, S., Sinha, S., & Luthra, K. (2017). Cross-neutralizing anti-HIV-1 human single chain variable fragments (scFvs) against CD4 binding site and N332 glycan identified from a recombinant phage library. ***Scientific Reports***, 7, 45163. https://doi.org/10.1038/srep45163

37. Chaudhary, O., **Kumar, S.,** Bala, M., Singh, J., Hazarika, A., & Luthra, K. (2015). Association of DC-SIGNR expression in peripheral blood mononuclear cells with DC-SIGNR genotypes in HIV-1 infection. ***Viral Immunology***, 28(8), 472–475. https://doi.org/10.1089/vim.2014.0148

38. Khan, L., Makhdoomi, M. A., **Kumar, S.,** Nair, A., Andrabi, R., Clark, B. E., Auyeung, K., Bhattacharya, J., Vajpayee, M., Wig, N., Pantophlet, R., & Luthra, K. (2015). Identification of CD4-binding site-dependent plasma neutralizing antibodies in an HIV-1 infected Indian individual. ***PLoS One***, 10(5), e0125575. https://doi.org/10.1371/journal.pone.0125575

COMPLETE LIST OF PUBLISHED WORKS / SOCIAL WEBPAGE LINKS

- https://orcid.org/0000-0002-8181-3999
- https://www.ncbi.nlm.nih.gov/myncbi/sanjeev.kumar.13/bibliography/public/
- https://scholar.google.co.in/citations?user=fwEpKhcAAAAJ&hl=en
- Scopus Author ID: 57301761100
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- https://www.researchgate.net/profile/Sanjeev-Kumar-98
- https://loop.frontiersin.org/people/467038/overview
- https://www.indiaalliance.org/fellow/dr-sanjeev-kumar
- https://twitter.com/SanjeevKumar_01

- www.linkedin.com/in/sanjeevkumarphd

BOOK CHAPTER

1. Gautam S, **Kumar S**, Dada R. Transcription Factor Analysis to Investigate Immunosenescence in Rheumatoid Arthritis Patients. Methods Mol Biol. 2025;2857:79-87. doi: 10.1007/978-1-0716- 4128-6_7. PMID: 39348056.

CONFERENCE ABSTRACT PUBLICATIONS

1. Mishra N, Sharma S, Dobhal A, Makhdoomi MA, **Kumar S,** Singh R, Das B, Lodha R, Kabra SK, Luthra K. Multivariant HIV-1 infection in infants with broadly neutralizing plasma antibodies: Implication for polyvalent vaccines. *Journal of The International AIDS Society*. Vol. 23, 5-5 (2020).
2. **Kumar S,** Kumar R, Makhdoomi MA. et al. A novel anti-CD4-binding site broadly neutralizing monoclonal single chain variable fragment (scFv) from HIV-1 clade-C chronically infected children. *AIDS Research and Human Retroviruses*. Vol. 34, No. S1. 125-125 (2018).
3. Makhdoomi MA, Nair A, **Kumar S**, et. al. Longitudinal analysis of early HIV-1-specific neutralizing activity and mapping epitope specificities in plasma of chronic HIV-1 clade C infected ART naïve children from India. *Journal of Virus Eradication*. Vol 2, Iss , Pp 27- (2016).
4. **Kumar S,** Kumar R, Makhdoomi MA, et al. Production of cross neutralizing single chain fragment variables (scFv) from HIV-1 infected Indian children. *BMC Infect Dis* 14 (Suppl 3), E25 (2014).
5. Chaudhary O, **Kumar S,** Makhdoomi MA, et al. Protective Role OF DC-SIGNR in HIV-1 Pathogenesis. *AIDS Research and Human Retroviruses*. Vol. 30, S1. A124-A124 (2014).
6. Chaudhary O, **Kumar S,** Aggarwal H, et al. DC SIGNR silencing reduces HIV-1 infection in Dendritic cells. *BMC Infect Dis* 14 (Suppl 3), O8 (2014).
7. Chaudhary O, **Kumar S,** Makhdoomi MA, et al. DC-SIGNR polymorphism and expression: correlation with dendritic cell count and subsets in Indian HIV-1 infected patients and injecting drug users. *AIDS Research and Human Retroviruses*. Vol. 29, No. 11. A95-A95 (2013).

CONFERENCE ABSTRACT PRESENTATIONS

1. **Kumar S** et. al. Mechanistic insights for neutralization and evasion of Omicron variants from SARS-CoV-2 neutralizing antibodies. Z5: B Cell Biology in the Context of Infectious Diseases, Autoimmunity and B Cell Cancers. Kesytone Symposia, Colorado, USA. 06 – 10, June 2023.
2. Singh S, **Kumar S**, et. al. Structure and Immunogenicity of native-like HIV-1 Clade-C envelope trimers from a pediatric elite-neutralizer across diverse platforms. IAS 2023, the 12th IAS Conference on HIV Science. Brisbane, Australia.
3. **Kumar S** et. al. The HIV-1 Indian subtype C chronically infected pediatric LTNPs demonstrated higher ADCC activity than progressors. X8: Functional Cures and the Eradication of HIV. Keystone Symposia Conference 2019, Whistler, British Columbia, Canada.
4. **Kumar S** et. al. A novel anti-HIV-1 CD4-binding site targeted broadly neutralizing scFv isolated from a recombinant phage library constructed from the PBMCs of Indian clade-C chronically infected children. FIMSA-2018 at Bangkok, Thailand.

5. **Kumar S** et. al. A Novel Anti-CD4-binding Site Broadly Neutralizing Monoclonal Single Chain Variable Fragment (scFv) from HIV-1 Clade-C Chronically Infected Children. HIVR4P-2018 conference, Madrid, Spain, 21-25 October 2018.
6. **Kumar S** et. al. A novel anti-HIV-1 broadly neutralizing scFv against the CD4- binding site epitope from Indian clade C chronically infected children. Young Scientists' Presentation in 7th Annual CME 2018 SGRH, New Delhi, India.
7. **Kumar S** et. al. A novel broadly neutralizing scFv targeting the CD4-binding site epitope of HIV-1 isolated from clade C chronically infected children. Young Scientists presentation session in international conference on Biopharma drug discovery-2018, Thapar University, Patiala, India.
8. **Kumar S** et. al. A human broadly neutralizing single chain variable fragment (scFv) against CD4- binding site from HIV-1 clade C chronically infected Indian children'. J6: Progress and Pathways Toward an Effective HIV Vaccine Keystone Symposia Conference 2018, Banff, Alberta, Canada.
9. **Kumar S** et. al. Construction and screening of human recombinant single chain variable fragment (scFv) phage library against envelope glycoprotein of subtype-C HIV-1 from paediatric patients. ACBICON-2013, Delhi, India.
10. **Kumar S** et. al. Generation and characterization of anti-CD4bs scFv from subtype-C HIV-1 infected Indian children'. IMMUNOCON-2013, Delhi, India
11. **Kumar S,** Kumar R, Makhdoomi MA, et al. Production of cross neutralizing single chain fragment variables (scFv) from HIV-1 infected Indian children. 2nd International Science Symposium on HIV & Infectious Diseases (HIV SCIENCE 2014), held in Chennai, India. 30 January – 01 February 2014.

PATENTS

1. Indian Patent Application [201811021940] Date of Filing: June 12, 2019 (Granted in 2024). Title: **A broadly neutralizing antibody**. Inventors: Kalpana Luthra, **Sanjeev Kumar**, Rakesh Lodha
2. Indian Patent Application [202111052088] Date of Filing: Nov 13, 2021. Title: **Human Monoclonal antibodies against SARS-CoV-2**. Inventors: Anmol Chandele, **Sanjeev Kumar**, Amit Sharma, Murali-Krishna Kaja
3. Indian Patent Application [202511007814] Date of Filing: Jan 30, 2025. Title: **Binding and Neutralizing Antibodies to Dengue or Zika Virus**. Inventors: **Sanjeev Kumar**, Anmol Chandele.
4. Indian Patent Application [202511007815] Date of Filing: Jan 30, 2025. Title: **Engineered DENV and ZIKV Dimeric Envelope Glycoproteins Based on Consensus Sequences**. Inventors: **Sanjeev Kumar**, Anmol Chandele
5. Indian Patent Application [202511007811] Date of Filing: Jan 30, 2025. Title: **Dengue and ZIKV Chimeric Vaccine Candidates**. Inventors: **Sanjeev Kumar**, Anmol Chandele

FELLOWSHIPS / GRANTS

1. **INSPIRE Faculty** Fellowship, by DST, India (Not Availed) in 2023. **(Principal Investigator)**
2. **DBT – Wellcome Trust India Alliance Early Career Fellowship**, in Biomedical Sciences. January 2020 – December 2024. *Grant Title: Harnessing The Power of High-throughput Human Monoclonal Antibodies for*

Rational Design and Development of Dengue Envelope Immunogens using Reverse Vaccinology 2.0. Amount INR 1.68 Crores or ~ $200,000. **(Principal Investigator)**

3. **Gates Foundation Grant:** *Grant Title: Immunological Landscapes in Persistent HPV Infections in India.* December 2024 – November 2026. Amount $770,000. **(Co-Investigator)**
4. **HIV Research Trust Scholarship**, by HIV Research Trust, UK, to learn and gain expertise in B cell repertoire deep sequencing and single-cell RNA-seq at Prof. Dennis R. Burton and Dr. Bryan Briney's lab, IAVI-NAC, The Scripps Research Institute, CA, USA. July 2019 – August 2019. *Project Title: Understanding the evolution of HIV-1 broadly neutralizing antibodies by Next-generation sequencing.* Amount $9,301.30.
5. **EMBO**-Short Term Fellowship, by EMBO, Germany, to learn and gain expertise in HIV-1 vaccine design at Prof. Rogier Sanders' lab, AMC, Amsterdam, The Netherlands. October 2018 – December 2018. *Project Title: "Design and development of stabilized native-like HIV-1 trimeric immunogen from Indian clade C envelopes isolated from a pediatric elite neutralizer".* Amount €7,995.30.
6. **Senior Research Fellowship** was awarded by the Indian Council of Medical Research (ICMR), New Delhi, India, in August 2019 (Not Availed). *Project Title: Generation and Characterization of native-like HIV-1 pre-fusion state trimeric immunogens from an Indian HIV-1C envelope.*

TEACHING & MENTORING EXPERIENCE

- Supervised postdocs and technical staff in the Wrammert lab, Emory University, USA
- Mentored two research assistants at ICGEB, New Delhi, as staff recruited to accomplish a research grant project funded by the India Alliance.
- Taught and mentored medical bachelor students, MBBS, and PhD graduate students at AIIMS, New Delhi, India, in molecular biology and immunological assays and techniques.

TEACHING / RESEARCH COURSES

- Successfully completed AIIMS-CMETi, Delhi course "**Scientific Writing for Publication**" August 2026.
- Successfully completed online workshop on **"Essentials of Evidence-based Medicine: Systematic Reviews, Meta-analysis and GRADE methodology"**, organized by the Technical Resource Center (TRC), Department of Health Research (DHR), AIIMS, New Delhi. August 2026.
- Successfully completed two months online course "**Mastering Medical Teaching**" from Stanford University, USA. October 2025.
- Participated in the GIAN Course "**Recent Advancements in Biophysical Techniques and Virology**" at IIT Roorkee. April 2018.

SCIENTIFIC WORKSHOPS

- Participated in the **DBT Genome Engineering workshop**, IISc, Bangalore

- Participated in **'Next Generation Sequencing (NGS) workshop 2017'** at CDRI, Lucknow, India.
- Flow cytometry training workshop on **"Vaccine design and development",** International AIDS vaccine initiative IAVI, NIRT, Chennai, India

INVITED TALKS / PRESENTATIONS

- Delivered an invited talk entitled *"Structural Basis of Antibody Escape and Broad Neutralization in Evolving SARS-CoV-2 Variants"* at the ViroGlobal 2026 conference organized by Manipal Institute of Virology and National Institute of Virology at Manipal, Karnataka, from 16-17 April 2026.
- Delivered an invited talk, '*Broadly Neutralizing Antibodies and Vaccine Candidates to HIV-1'*. World Vaccine Asia Conference, Singapore. 09 – 10, November, 2022.
- Delivered an invited talk, '*Isolation and characterization of ultrapotent SARS-CoV-2 neutralizing human monoclonal antibodies*. World Vaccine Asia Conference, 2021, Singapore
- Delivered an invited talk, *'Cross-neutralizing scFvs against HIV-1 envelope glycoprotein from clade C chronically infected Indian pediatric donors.* BioZest-2017 Festival, South Asian University, New Delhi, India, 2018.
- Delivered an invited talk, *'Basics of HIV-1 and immunological and molecular biological methods for the generation of anti-HIV-1 monoclonal antibodies.* Biospark-2015', Dept. of Biochemistry, Deshbandhu College, Delhi University.

AWARDS & HONORS

1. **Global Health Travel Award** by Bill and Melinda Gates Foundation to attend Keystone Symposia, Colorado, USA in 2023.
2. **Global Health Travel Award** by the Bill and Melinda Gates Foundation to attend the Keystone Symposia, Florence, Italy, in 2020.
3. Dr. Arun Fotedar Memorial **AIIMSONIANS Award-2019** for Best PhD paper publication in 2019.
4. **Sun Pharma Research Scholars Award**-2018 (Ranbaxy Award), for Biomedical research in 2018.
5. **FIMSA International Travel Award** to attend the FIMSA-2018 conference.
6. **Full Scholarship** to attend the HIVR4P-2018 conference in Madrid, Spain.
7. Prof. L.M. Srivastava **Gold Medal Award,** 1st Prize, for Best Oral presentation in 2018.
8. **Best Oral-Presentation Award 1 Prize** in the 'International Conference on Biopharma Drug Discovery' organized by Thapar University, Patiala, Punjab.
9. **DST International travel grant** to attend Keystone Symposia in 2018.
10. **Global Health Travel Award** from the Bill and Melinda Gates Foundation to attend Keystone Symposia in 2017.
11. Joginder Singh Duggal Memorial Award **Runner-up Prize in Quiz competition**-2014.
12. Qualified CSIR/UGC National Eligibility Test (NET), Human Resource Development India (HRD), in 2014.
13. Medal Award for securing **Rank 7 at the national level** in the 4th International Level Science Talent Examinations 2002-2003.
14. **Rank 1 at the school level** in the International Level Science Program 'SCIENCE 2000'.

TECHNICAL SKILLS

TECHNOLOGIES

- Reverse Vaccinology 2.0 (Viral envelope-based immunogen design and development)
- Antigen-specific single B cell sorting technology for high-throughput mAbs production
- Phage Display technology
- 10x Genomics and BD Rhapsody-based single-cell Omics, single-cell next-generation sequencing
- B cell receptor (BCR) Deep Sequencing
- Protein subunit vaccines, DNA vaccines, circular RNA vaccines, and Protein self-assembling nanoparticle vaccine design

MOLECULAR BIOLOGY, IMMUNOLOGY & TECHNICAL SKILLS

- Single-cell PCR and cloning
- Multicolor Flowcytometry
- ELISPOT assay
- ELISA
- Mesoscale Discovery assay (MSD)
- Surface plasmon resonance (SPR)
- Octet Bio-Layer Interferometry (BLI)
- Cell surface binding assay
- Expression of pseudo-virus clones
- FRNT-based live virus neutralization assay
- Pseudovirus-based neutralization assay
- Gene cloning and protein expression in mammalian and bacterial systems
- Protein purification from mammalian and bacterial cultures
- Animal Immunizations and raising of polyclonal antibody response in rabbits
- HIV-1 neutralization assays
- Competition and antibody depletion assays
- Epitope characterization of anti-HIV-1 polyclonal and monoclonal antibodies using recombinant proteins, overlapping peptides, and viral mutants
- Learned the basics of Negative staining EM, cryoEM

SOFTWARE / TOOLS

Familiar with Microsoft Office, GraphPad Prism, FlowJo, Zotero, EndNote, ClustalX, IMGT, Ig BLAST, PyMol, Bio-Edit, and Mega.

PROFESSIONAL MEMBERSHIPS

1. Member of the Royal Society of Biology (MRSB), UK.
2. Life member of the Indian Immunology Society (IIS).
3. Life member of the Association of Clinical Biochemists of India (ACBI).
4. Life member of the Indian Virological Society (IVS).
5. Life member of the Indian Academy of Biomedical Sciences (IABS).
6. Global Outreach member of the American Society of Microbiology (ASM).
7. Member of the International Society for Vaccines (ISV).

EDITOR / REVIEWER ROLE

1. Former Editor at Scientific Reports and Frontiers in Virology, Current Guest Editor for Vaccines (MDPI)
2. Reviewed for Nature Communications, Cell Reports, STAR Protocols, EMBO Molecular Medicine, Microbiology Spectrum, Review Commons, Frontiers in Immunology, Viruses (MDPI), Vaccines (MDPI), IJMS (MDPI), Epidemiologia (MDPI), Cancer Cell International

NEWS / PUBLIC ENGAGEMENT

- https://www.telegraphindia.com/india/indian-scientists-come-up-with-coronavirus-busting-antibody-effective-against-multiple-variants/cid/1891181
- https://www.nature.com/articles/d44151-022-00111-8
- https://indiaalliance.org/stories_of_science/monoclonal-antibody-against-coronavirus
- https://indiaalliance.org/stories_of_science/neautralising-therapeutics-to-covid-sanjeev-kumar
- https://www.youtube.com/watch?v=PZe7QfKacl8

PERSONAL DETAILS

Nationality: INDIAN