Brief Curriculum vitae

Sunil K.Arora, Ph.D., MAMS

Current Placement: Professor,
& Affiliation Dept. of Immunopathology,

Head, Dept. of Translational & Regenerative Medicine
Postgraduate Institute of Medical Education & Research,
Chandigarh-160012, INDIA

Education: Ph.D. (Immunopathology) 1987
PGIMER, Chandigarh, India

M.Sc. (Hons. School) Biochemistry, 1980
Panjab University, Chandigarh, India

Google-scholar link: https://scholar.google.com/citations?user=dteDnjAAAAAJ&hl=en
Citations: 3759; h-index: 30; i10 index: 76

Honour: Membership of the **National Academy of Medical Sciences** (India)- Elected Feb 2004

Affiliations:

May 1991 – May 1993
POST-DOCTORAL FELLOW-Dept. of Medicine, Div. of Infectious Diseases, Univ. of Texas Health Science Centre at San Antonio, Texas, USA

June 1993 – June 1999
ASSISTANT PROFESSOR-Dept. of Immunopathology, PGIMER, Chandigarh, India

July 1999 – June 2003
ASSOCIATE PROFESSOR-Dept. of Immunopathology, PGIMER, Chandigarh, India

July 2003 – June 2008
ADDITIONAL PROFESSOR-Dept. of Immunopathology, PGIMER, Chandigarh, India

July 2008- continuing
PROFESSOR-Dept. of Immunopathology, PGIMER, Chandigarh

Awards/Honours:

YOUNG-INVESTIGATOR AWARD:	Indo-US collaborative Contraceptive Development and Reproductive Immunology project Awarded by the USAID-DBT 1991
VISITING SCIENTIST:	University College of London (UCL), London, UK. Jan 2001 to May 2001.
VISITING PROFESSOR:	Allex Mowat Immunopathology Laboratory, King's College London (KCL), London, UK. May 2004 to July 2004
VISITING GUEST FACULTY	Laboratory for Clinical and Biological Studies (LCBS), University of Miami-School of Medicine, Miami, FL, USA Aug.2007 to Jan. 2008
VISITING GUEST PROFESSOR	Department of Clinical Immunology and Rheumatology, Hanover Medical School, Hanover, Germany May/June 2008 & Nov. 1st to 14th 2009

FOGARTY AITRP FELLOW	Department of Pathology, VA Medical Center, New York University School of Medicine (NYUSoM), New York, USA. June-July 2012.
SENIOR SCIENTIST ORATION AWARD	Senior Scientist Oration Award for the year 2018 by the Indian Immunology Society conferred on 1st Nov. 2018 in the Annual Conference of Indian Immunology Society (IMMUNOCON-2018) at THSTI, Faridabad.

Membership of academic bodies:

Member of the **National Academy of Medical Sciences** (India)-
Admitted Feb 2004

Member –Technical Resource Group for Lab Services
National AIDS Control Organization (NACO-Govt. of India)- 2018 onwards

Member- Technical Expert Committee- Immunodiagnostic Kit Laboratories
National Institute of Biologicals (NIB), Noida- 2017 onwards

Chairman-IAEC
Institute Animal Ethics Committee (PGIMER, Chandigarh)- 2017 onwards

Member, Institute Committee for Stem Cell Research- Sept. 2011 onwards
Member, Institute Research Review Committee- 2008 onwards

Member of Advisory Board
Biosciences Research Institute, Bangalore- Aug, 2009
International Journal of Immunology Research-July 2013

President (2018-2021)
Indian Immunology Society

President (2019-2021)
The Cytometry Society (India)

Vice-President (2019 –2022)
Federation of Immunological Societies of Asia-Oceania (FIMSA)

Member Editorial Board

1. Recent patents in antiviral drugs
2. Gastroenterology and Hepatology Research journal
3. Global J Breast Cancer Research
4. International J Immunology
5. Current AIDS Research

Editor
Expert Reviews on Immunology Vaccines and Informatics (Aug. 2014 onwards)

Research Interests:

1. Identification and evaluating the protective efficacy of novel prophylactic and therapeutic vaccine candidate antigens of *Leishmania donovani* using epitope mapping and molecular techniques.
2. Evaluating immunomodulatory and regenerative potential of mesenchymal stem cells in bone degenerative disorders like RA and osteoporosis
3. Evaluating the role of Cancer Stem cells in aggressive behaviour of breast cancer
4. Evaluating molecular mechanisms leading to cellular immune and dendritic cell defects in chronic viral infections; mainly HIV and HCV.

5. Evaluating the molecular mechanisms related to *Mycobacterium tuberculosis* mediated genetic and phenotypic diversity of HIV-1 in co-infected host..
6. Molecular evaluation of various growth factors effecting the metastasis of breast carcinoma and hepatocellular carcinoma

Research Projects:

Sl.No	TITLE OF THE PROJECT	DURATION	AGENCY
1	Cloning the gene(s) of Leishmania donovani expressing antigen(s) having protective potential'	1999-03	DBT
2.	Typing of Human Papilloma Virus in skin tags and oral lichen planus by RFLP-PCR (PI)	2002-04	PGI
3.	Study of Cell mediated Immune response in patients with Hepatitis E Infection (PI)	2003-04	PGI
4.	Development of Multiplex PCR for the detection of six organisms in ocular fluids (Co-PI)	2003-06 completed	DST
5.	Immunomodulatory effects of Mw vaccine in patients with M.tuberculosis: a multi centric clinical trial. (PI)	2004-10 completed	DBT
6.	Protective efficacy of recombinant antigens of Leishmania donovani using various adjuvant (PI)	2005-08 completed	DBT
7.	Genotypic analysis of mutations in pol-gene of HIV-1 in treatment-naïve patients PI Dr Sunil K.Arora	2006-08 completed	ICMR
8.	Mechanisms involved in downregulation of effector cell activity in tuberculosis and HIV co-infections, PI: Dr Sunil K. Arora	2007-11 completed	DBT 39.28 lac
9	To evaluate the role of innate immune responses in HIv infection (Indo-German collaborative) PIs: Dr Sunil K.Arora	2008-11 completed	ICMR-48.93 lac
10.	Evaluate the maturation defects in chronic viral hepatitis	May 2012- Apr. 15 Completed	DST 34.91 lac
11.	Role of β1 integrins in the Leishmania macrophage interaction in the experimental visceral leishmaniasis	2011-13 Completed	DST
12.	Analysis of innate immune genes and identification of novel signature SNPs associated with immunological/virological discordance in HIV-1 infection	Mar 2012- Feb 2015. Completed	DBT 83.50 lac
13.	Elucidating the molecular mechanisms of DC dysfunction in non-responders to antiviral therapy in individuals infected with HCV Genotype	Apr. 2012 – Mar 2015 Completed	CSIR 21.28 Lac
14.	To evaluate the role of negative regulatory factors in the functional impairment of dendritic cells during HIV-1 infection	Nov. 2012- Oct.2015 Completed	ICMR 11.83 lac
15.	Assessing the anti-HIV properties of some novel mannose-binding lectins (MBLs) from Indian subcontinent	Apr.2015 - Mar 2018 Completed	ICMR 38.15 Lac
16	To evaluate the role of M. tuberculosis in functional modulation of the host intrinsic anti-viral factors influencing the HIV disease progression among HIV-TB co-infected individuals	3 years (approved June 2019 but not started yet)	ICMR 53.48 Lakhs

Submissions: GenBank data Base:

Three novel gene sequences from *Leishmania donovani* submitted to genBank database. Definitions—

1. *Leishmania donovani* ribosomal P-1 like protein mRNA- homologous to Eukaryotic Initiation factor (eIF-4A) (accession number *AY161269*)
2. *Leishmania donovani* acidic ribosomal protein P0 gene (accession number *AY180912*)
3. *Leishmania donovani* novel gene having no similarity to any of existing sequences in gene data bank. (accession number: AY377788)

Patents (US patent granted Mar 2009)
US Patent Granted: No. US 7,504,494 82 granted Mar 17, 2009 for invention related to a multiplex PCR assay capable of screening or detecting the relevant microbial organism specific to *Mycobacterium tuberculosis, Toxoplasma gondii,* pathogenically important fungii and cytomegalo virus (CMV) in a clinical sample.

Submissions*: (submitted for Indian & US patent)*

1. Patent for Multiplex PCR for detection of *M. tuberculosis*, *Toxoplasma gondii* and clinically important fungi
2. Patent for multiplex PCR for detection of Cytomegalo virus, Herpese simplex virus and Verisolla zoster virus
3. A new Leishmania donovani specific PCR based diagnostic test for kala azar.

Publications:

Papers:	172
Reviews in journals:	7
Chapters in books:	15
Editorials:	2
Invited/Guest Lectures Delivered:	195

Selected publications:

1. Identification of major antigens of Leishmania donovani promastigotes using kala azar sera. Arora SK and Sehgal S. Med Microbiol Immunol 1988; 178:81-88.
2. Receptor mediated drug-delivery of macrophages: a novel chemotherapeutic approach against leishmaniasis. Mukhopadhyaya A, Chaudhri G, Arora SK, Sehgal S and Basu SK. Science 1989; 244:705-707.
3. Use of in vitro method to assess different brands of anti-leishmania drugs. Arora SK, Sinha R and Sehgal S. Med Microbiol Immunol 1991; 180:21-27.
4. Detection of leishmania antigen in kala azar patients using monoclonal antibodies. Sinha R, Arora SK, Datta U and Sehgal S. Med Microbiol 1992; 36:391-400.
5. Use of monoclonal antibodies for the detection of leishmania antigens in kala azar patients. Sinha R, Sehgal S, Datta U and Arora SK. Microbiol Immunol 1992; 32:391-400.
6. Comparative evaluation of the anti-heat shock protein antibodies in SLE and healthy controls. Arora SK, Singh G and Sehgal S. Scand J Rheumatol. 1995; 24:160-163.
7. Lack of serological specificity of recombinant leishmania hsp70. Arora SK, Melby PC and Sehgal S. Immunol Cell Biol 1995; 73:446-451.
8. Recombinant heat shock protein is recognised from individuals with prior L.donovani infection. Arora SK, Sehgal S, Tryon VV and Melby PC. Immunol Infect Dis 1995; 5:282-286.
9. Genetic polymorphism in leishmania isolates using restriction enzyme length polymorphism of kDNA and cDNA probes. Kapoor GS, Arora SK and Sehgal S. Med Microbiol Immunol 1998; 186:209-214.
10. Heterogeneity in the heat shock protein gene of leishmania isolates. Arora SK, Singh G and Sehgal S. Immunol Cell Biol 1998; 76:186-189.
11. Recognition of Leishmania donovani by CD4+ T-cells of naïve healthy uninfected individual, Pal N and Arora SK. Submitted to J PARASIT DIS, 2004; 28:11-16.
12. Recombinant antigens of Leishmania donovani inducing IFN-g release from Leishmania specific cell line, Arora SK, Pal NS & S.Mujtaba. EXP PARASIT 2005; 109:163-170.
13. Frequency of drug-resistance mutation coexisting with wild type in treatment-naïve patients in India. Sachdeva N, Sehgal S and Arora SK. eJ INT AIDS SOC, Medscape General Medicine 2005: 7(3).
14. An epitope-specific PCR test for diagnosis Leishmania donovani infections. Arora SK, Gupta S, Sachdeva N. TRANS R SOC TROP MED HYG 2007; 102(1):41-45.

15. Drug-resistance associated genotypic alterations in pol-gene of HIV isolates from ART-naïve individuals in North India. Arora SK, Gupta S, Toor JS, Singla A. AIDS RES HUM RETROVIRUSES 2008; 24(2):125-30.
16. Increased frequency of intra-tumoral CD4+ CD25+ Treg cells in hepatocellular carcinoma. Thakur S, Singla A, Rajwanshi A, Chawla Y and Arora SK. J HEPATOLOGY 2008; 48: Supplement 2, S136.
17. Vaccination with a novel recombinant Leishmania antigen along with MPL provides partial protection against L. donovani challenge in experimental model of visceral leishmaniasis. Bhardwaj S, Vasishta RK and Arora SK. EXP PARASITOL 2009; 121:29–37.
18. Synthesis and Antileishmanial activity of Piperoyl-Amino Acid Conjugates. Inder Pal Singh, Shreyans K Jain, Amandeep Kaur, Sukhvinder Singh, Rajendra Kumar, Prabha Garg, Shyam S Sharma and Arora SK. EUR J MED CHEM. 2010;45:3439-3445.
19. Efficacy of Leishmania donovani ribosomal P1 gene as potential DNA vaccine in experimental visceral leishmaniasis. Masih S, Arora SK and Vasishta RK. EXP PARASITOL 2011; 129: 55-64.
20. HBV specific T-cell responses in hepatitis B. Rana D, Menachery J, Chawla YK, Duseja A, Dhiman RK, Arora SK. TROP GASTRO 2011; 32(4): 273-278.
21. Prediction of drug-resistance in HIV-1 Subtype C based on protease sequences from ART naïve and first line therapy failures in North India using genotypic and docking analysis. Toor JS, Verma R, Gupta P, Garg P, Sharma A and Arora SK. ANTIVIRAL RESEARCH 2011; 92:213-18.
22. Functional reconstitution of defective myeloid Dendritic Cells in chronic Hepatitis C infection on successful anti-viral treatment. Rana D, Chawla Y, Duseja A, Dhiman RK, Arora SK. LIVER INTERNATIONAL 2012; 32(7): 1128-37. doi: 10.1111/j.1478-3231.2011.02754.x.
23. Maturation defective myeloid Dendritic Cells in Non-alcoholic fatty liver disease patients release inflammatory cytokines in response to endotoxin. Rana D, Chawla Y, Duseja A, Dhiman RK, Arora SK. HEPATOL INTNL 2012; 7(2):562-569. DOI 10.1007/s12072-012-9371-6.
24. Prediction of NRTI drug resistance in HIV-1 subtype C among first line antiretroviral-experienced virological failure patients from North India using genotypic and docking analysis. Toor JS, Kumar R, Garag P, Sharma A, Arora SK. J AIDS CLIN RES 2012, S5: 005. doi:10.4172/2155-6113.S5-005.
25. Differential expression of Rac-1, CxCR4 and CCR5 on CD4 T-cells at different stages of HIV-1 disease relate to its progression in therapy-naïve individuals. Toor JS, Sharma A, Kamboj SS and Arora SK. J AIDS CLIN RES. 2013; 4:207. doi:10.4172/2155-6113.1000207.
26. Viral proteins mediate upregulation of negative regulatory factors causing downmodulated dendritic cell functions in chronic hepatitis C virus infection. Rana D, Chawla YK, Duseja A, Dhiman RK and Arora SK. EUR MED J –HEPATOLOGY 2013;1:68-76
27. Success of Antiviral Therapy in Chronic Hepatitis-C Infection Relates to Functional Status of myeloid Dendritic Cells Rana D, Chawla YK and Arora SK. Invited review submitted to Special issue, 'Translational Research in Health and Disease' in IND J MED RES. 2013; 138(5): 766-778.
28. High producer haplotype (CAG) of -863C/A, -308G/A and -238G/A polymorphisms in the promoter region of TNF-α gene associate with enhanced apoptosis of lymphocytes in HIV-1 subtype C infected individuals from North India. Singh S, Sharma A, Arora SK. PLOS ONE. 2014, 9(5): e98020. doi:10.1371/journal.pone.0098020.
29. Mycobacterium tuberculosis modulates the gene interactions to activate the HIV replication and faster disease progression in a co-infected host. Toor JS, Singh S, Sharma A, Arora SK. PLOS ONE 2014; 9(9): e106815.
30. Functional Impairment of Myeloid Dendritic Cells during Advanced Stage of HIV-1 Infection: Role of Factors Regulating Cytokine Signaling. Sachdeva M, Sharma A and Arora SK. Plos One 2015; 10(10: e0140852. DOI:10.1371/journal.pone.0140852.

31. Combination of low producer AA-genotypes in IFN-c and IL-10 genes makes a high risk genetic variant for HIV disease progression. Singh S, Sharma A, and Arora SK. Cytokine 2015; 77:135-44.
32. Leishmania recombinant antigen modulates macrophage effector function facilitating early clearance of intracellular parasites. Ratna A; Arora SK. Trans Roy Soc Trop Med Hyg 2016 110 (10): 610-619. doi: 10.1093/trstmh/trw068.
33. Increased expression of negative regulators of cytokine signaling during chronic HIV disease cause functionally exhausted state of Dendritic cells. Sachdeva M, Sharma A and Arora SK. Cytokine 91:118-123; 2017.
34. Manα1-2Man binding anti-HIV lectins enhance the exposure of V2i and V3 crown neutralization epitopes on the V1V2 and V3 hypervariable loops of HIV-1 Envelope. Jan M, Upadhyay C, Sharma A, Hioe CE, Arora SK. AIDS Research and Human Retroviruses- 2017 Sep;33(9):941-945. doi: 10.1089/AID.2016.0262.
35. Innate sensing of HIV-1 by DC-SIGN on Dendritic Cells: degradation and presentation vs. transmission of virus to T cells is determined by glycan composition of viral envelope. Jan M & Arora SK. AIDS Res Human Retrovir. 2017 Jul 27. doi: 10.1089/aid.2016.0290. [Epub ahead of print].
36. a(1–6)-Fucosylated Complex Glycan-Binding Lentil Lectin Enhances In Vitro HIV-1 Infection and DC-SIGN-Mediated Viral Capture and Transmission to CD4 Cells. Jan M, Tomar S, Arora SK. AIDS Res Hum Retro. 2018; 34:641-44. DOI: 10.1089/aid.2018.0045.
37. Heterogeneity in the glycan composition on the surface of HIV-1 envelope determines the sensitivity to lectins. Jan M, Upadhyay C, Sharma A, Hioe CE, Arora SK. PLoS One, 2018 Mar 26;13(3): e0194498. doi: 10.1371/journal.pone.0194498. eCollection 2018.
38. Emerging strains of HIV-1 subtype C acquire multiple NF-ƙB binding sites in the LTR in co-infected individuals. Mehta G and Arora SK. Eur. J. Immunol 2019; 49, S3, (1236). P1558.
39. Signature genes associated with Immunological Non-responsiveness to Anti-retroviral therapy in HIV-1 infection. Singh S, Toor JS, Sharma A and Arora SK. Plos One 2020; 15(6): e0234270: 1-17. doi.org/10.1371/journal.pone.0234270 J.
40. Human Umbilical Cord derived Mesenchymal Stem Cells induce tissue repair and regeneration in collagen-induced arthritis in rats. Vohra M, Sharma A, Bagga R, Arora SK. J Clin Trans Res. 2020; 7(1): 6-19.
41. Human Immunodeficiency virus-1 (HIV-1) subtype-C genetically diversify to acquire higher replication competence in human host with co-morbidities. Mehta G, Sharma A, Arora SK. AIDS Res Hum Retroviruses. 2021 Jan 7. doi: 10.1089/AID.2020.0118. Online ahead of print.
42. Acquisition of additional NFκB binding sites in LTR of genetically evolving HIV-1 subtype C viral species in host with co-morbidities. Mehta G, Sharma A, Arora SK. AIDS Res Hum Retroviruses. 2021 Jan 13. doi: 10.1089/AID.2020.0195. Online ahead of print
43. A T-Cell Epitope-Based Multi-Epitope Vaccine Designed Using Human HLA Specific T Cell Epitopes Induces a Near-Sterile Immunity against Experimental Visceral Leishmaniasis in Hamsters. Arya A, Arora SK. Vaccines 2021, 9, 1058. https://doi.org/10.3390/vaccines9101058.
44. Evaluation of breast cancer stem cells in human primary breast carcinoma and their role in aggressive behavior of the disease. Dhanota N, Bal A, Singh G, Arora SK. Journal of Clinical and Translational Research. Published sept. 29, 2021; 7(5): 1-14. 10.18053/Jctres/07.202105.00.