

Arun Chauhan, Ph.D.
Assistant Research Professor
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(US Permanent Resident)

SUMMARY OF QUALIFICATIONS

- Wide-ranging experience in Immunology, Oncology, Molecular Biology and infectious disease with strong expertise in disease Model.
- Experience in immune cell isolation, innate cell purification, co-culture assays, cytokine (ELISA, CBA) and cell proliferation, Cytotoxic assay.
- Extensive experience in molecular biology techniques such as, RT-PCR, western blot, Nucleic acid Extraction, Quantitative PCR, DNA footprinting assay, and recombinant DNA technology).
- Strong expertise in cell based immunological assays (ELISPOT), Reporter assay, transplantation, multiparametric flow cytometry, FACS, Intracellular Cytokine staining.
- Experience in mammalian primary cell Culture, & primary human lymphocyte (T cells, B cells, DCs and macrophages) from blood, si/shRNA transfection, CRISPR/Cas9.
- Successfully initiated, managed and completed multiple projects simultaneously and published research in peer-reviewed journals.
- Competent to work independently and in team-based projects as evident from more than 20 publications.
- Ability to critically analyze and troubleshoot data, interpret results and effectively present findings in meetings.
- Excellent organizational, and written, oral and interpersonal communication skills.

PROFILE

Interdisciplinary immunology, Molecular, Epigenetics-scientist with an in-depth expertise in *in vitro* and *in vivo* cell-based assays (murine and human), involving macrophages, Neutrophils and T-cells. Development of murine models to investigate the role of macrophage plasticity and T-cell functionality in Sjogren's Syndrome and Pneumonic Sepsis (2° Infection) in fate mapping mice. Proven expertise in genome molecular biology (RNA-Seq, ChIP Seq, ATAC seq & short capped RNA-seq). Proven ability to complete projects in time-bound manner. Highly motivated and driven researcher with strong communication, interpersonal and organizational skills. Capable of working independently and as part of a team, designing and executing experiments. Trained and mentored junior scientific staff.

PROFESSIONAL EXPERIENCE

Aug 2018-present **Assistant Research Professor**, University of North Dakota, Grand forks, ND, USA. Using ex vivo and in vitro cell based systems and molecular biology tools (Next Generation Sequencing), current investigations are aimed at identification and characterization of novel interventional targets in inflammatory diseases, Sjogren's Syndrome and pneumonic sepsis with neutralizing antibody.

Jan 2013- Aug 2018 **Post-Doctoral Fellow**, University of North Dakota, Grand Forks, ND USA.

- Developed preclinical animal models of peritonitis, sepsis and Co-infection model (LysM cre/Td tomato red mouse line).
- Performing lead role in studies of macrophage plasticity via Epigenetics, intracellular cytokine staining: Multicolor flow cytometry and Cell sorting.
- Optimized and developed standard operating procedures for basic immunological and molecular biology assay (Tissue culture, Transfection, ELISA, Cytotoxic T Lymphocyte assay, Western blot, immune-precipitation, ELISPOT, Calcium Signaling, Primary human immune cell co-culture, Immune cell differentiation, HPLC, Confocal Microscopy).
- Tested the translational significance of mouse models of acute lung infection in clinical setting involving human patients from Systemic Inflammatory Response Syndrome.
- Performed CHIP Seq, RNA seq, ATAC seq and short capped RNA seq from macrophages and neutrophils in murine and human Sepsis.
- Overcame limitation of Genome wide analysis at Chip seq and scRNA libraries in Macrophages and Neutrophils (gene ontology, target identification, Kegg pathways).
- Managed several projects from conception of idea, to study design, to experiments and writing of manuscripts.
- Working with expert team of bioinformatics and immunologists in a highly collaborative environment.
- Strong communication skills and highly collaborative nature as demonstrated by establishing and managing collaborations with several academic institutions and CROs on multiple projects to develop and maximize research goals for our disease model platform.

October 2008-September 2012 **PhD**, Aligarh Muslim University, Aligarh, India

- Developed Nano-particle based drug delivery system in vaccine studies against prophylactic treatment of opportunistic fungal pathogen.
- Worked on Escheriosome mediated cytosolic delivery of Candida albicans cytosolic proteins induces enhanced cytotoxic T lymphocyte response and protective immunity.
- Established Vaccine potential of cytosolic proteins loaded fibrin microspheres of Cryptococcus neoformans in BALB/c mice.
- Established Role of nanoparticle in cancer detection and treatment.
- Performed Escheriosome mediated cytosolic delivery of Plk1 specific siRNA: Potential in treatment of liver cancer.
- Fungus-mediated biological synthesis of gold nanoparticles: potential in detection of liver cancer.

RESEARCH EXPERTISE

Experience using cellular and molecular techniques to study cell biology in inflammatory, Pneumonic Sepsis and auto-immune diseases. Specific technical expertise includes:

- Experienced in multi-parameter flow cytometry and data analysis (FlowJo), Cell Sorting.
- Magnetic cell sorting using Miltenyi AutoMACS and stem cell kits (Human Blood and murine tissue samples).
- Cell-based immunoassays: Cytotoxic T Lymphocyte, Primary Cell Culture (Macrophage, DCs, T-cell etc), Cell Viability, ELISA, Proliferation, Phagocytosis, tissue histology, immunostaining, Cytokine beads array (CBA), CFSE Proliferation, Intracellular cytokine staining, Cell Phenotyping, primary human immune cell co-culture, immune cell differentiation, MLR.

- Establish and optimized DNA foot-print, RNA seq, CHIP seq and Short capped RNA libraries (Nucleoplasm vs Chromatin), DNA footprint, ATAC seq in Macrophage, Neutrophils DCs and T cell.
- Expertise in molecular biology and biochemistry techniques such as qPCR, Western blot, CHIP seq Library, RNA seq Library, immunoprecipitation.
- Advanced course “Genome wide analysis on RNA seq, Chip Seq and Short capped RNA seq” at University of North Dakota, Grand Forks, ND, USA.
- Competent with data analysis, Flow Jo, NIH Image software, PRISM, SIGMA PLOT, EndNote and MS Office package.

EDUCATION

Ph.D., Biotechnology, 2012
Aligarh Muslim University, Aligarh, India

Master of Science (MS), Microbiology, 2005
HNB Garhwal University, India

Bachelor of Science (BS), Biology, 2003
Maharishi Dayanand University, Rothak, India

TRAINING:

- Course on “Targeted Quantitative Proteomics”, National Proteomics Resource, Oklahoma INBRE.
- Advanced course “Genome wide analysis on RNA seq, Chip Seq and Short capped RNA seq” at University of North Dakota, Grand Forks, ND, USA.
- Trained to make CHIP seq Libraries, and short capped RNA seq Libraries from Nucleus and Fractionation component (Nucleoplasm and Chromatin).

Publications:

1. **Arun Chauhan**, Yuyang Sun, Pramod Sukumaran, Freddie O. QuenumZangbede, Brij B Singh, Bibhuti B Mishra. M1 macrophage polarization is dependent on TRPC1-mediated calcium entry. **iScience (Cell Press)**. 2018 Sep 20;8:85-102.
2. Khan, A.A., Alanazi, A.M., Jabeen, M. **Arun Chauhan**, M A Ansari. Therapeutic potential of functionalized siRNA nanoparticles on regression of liver cancer in experimental mice. **Sci Rep (Nature)** **9**, 15825 (2019)
3. Fredice Quenum Zangbede, **Arun Chauhan**, Jyotika Sharma, Mishra Bibhuti. Galectin-3 in M2 macrophages plays a protective role in resolution of neuropathology in brain parasitic infection by regulating neutrophil turnover. **Journal of Neuroscience** 25 July 2018, 38 (30) 6737-6750
4. **Chauhan, Arun**; Quenumzangbe, Fredice; Abbas, Ata; Bradley, David; Nechaev, Sergei; Singh, Brij; Sharma, Jyotika; Mishra, Bibhuti. Epigenetic modulation of microglial inflammatory gene loci in helminth induced immune suppression: Implications for immune regulation in neurocysticercosis. **ASN Neuro**. 2015 Jul 6;7(4).
5. **Chauhan A**, Sun Y, Sukumaran P, Sharma J, Singh BB, Mishra BB. Inhibition of store-operated calcium entry in microglia by helminth factors: implications for immune suppression in neurocysticercosis. **J Neuroinflammation**. 2014 Dec 24;11:210. doi: 10.1186/s12974-014-0210-7.

6. **Chauhan A**, Sun Y, Pani B, Quenumzangbe F, Sharma J, Singh BB, Mishra BB. Helminth induced suppression of macrophage activation is correlated with inhibition of calcium channel activity. **PLoS One**. 2014 Jul 11;9(7):e101023. doi: 10.1371/journal.pone.0101023. eCollection 2014.
7. **Chauhan A***, Khan N, Pooja C, Khan AA, Swaleha Z, Mohammad O and Abida M. Xenogenic Gama-irradiated Pathogen Harboring Macrophage Based Vaccine: Prophylactic Potential against Intracellular Pathogen *C. neoformans*. **J Vaccines Vaccin** 7:316. doi: 10.4172/2157-7560.1000316, 2016. (* as a corresponding author).
8. B Bhushan, SK Tomar, **A Chauhan**. Techno-functional differentiation of two vitamin B12 producing *Lactobacillus plantarum* strains: an elucidation for diverse future use. *Applied microbiology and biotechnology* 101 (2), 697-709.
9. **Arun Chauhan**, Swaleha Zubair, Ahamd Nadeem, Sajid Ali Ansari, Mohammad Yunus Ansari, Owais Mohammad. Escheriosome mediated cytosolic delivery of Plk1 specific siRNA: Potential in treatment of liver cancer in Balb/c mice. **Future Nanomedicine**, 2014, Vol. 9, No. 407-420, (doi: 10.2217/nnm.13.21).
10. **Arun Chauhan**, Swaleha Zubair, Asif Sherwani and Mohammad Owais. *Aloe vera* induced biomimetic assemblage of nucleobase into nanosized particles. **Plos One**, 2012; 7(3):e32049. Epub 2012 Mar 5.
11. **Chauhan A**, Zubair S, Tufail S, Sherwani A, Sajid M, Raman SC, Amir A, Owais M. Fungus-mediated biological synthesis of gold nanoparticles: potential in detection of liver cancer. **International Journal of Nanomedicine**. 2011; 6:2305–2319.
12. **Chauhan A**, Swaleha Z, Ahmad N, Farazuddin M, Vasco A, Abida M, Mohammad O. Escheriosome mediated cytosolic delivery of *Candida albicans* cytosolic proteins induces enhanced cytotoxic T lymphocyte response and protective immunity. **Vaccine**. 2011; 29(33): 5424-5433.
13. **Arun C**, Zubair S, Qamar Z, Saba T, Asif S, Sajid M and Owais M. Biomimetic assemblage of nucleobase 5-fluorouracil into nano-size three-dimensional particles. **Nature Precedings**: hdl:10101/npre.2011.6182.1 :3 Aug 2011.
14. Singla AK, Gurram RK, **Chauhan A**, Khatri N, Vohra RM, Jolly RS, Agrewala JN. Caerulomycin A suppresses immunity by inhibiting T cell activity. **PLoS One**. 2014 Oct 6;9(10):e107051. doi: 10.1371/journal.pone.0107051. eCollection 2014.
15. Singla AK, Gurram RK, **Chauhan A**, Khatri N, Vohra RM, Jolly RS, Agrewala JN. Caerulomycin A [corrected] A: a potent novel immunosuppressive agent. **Transplantation**. 2014 May 15;97(9):e57-9.
16. Azmat Ali Khan, Amer M Alanazi, Mumtaz Jabeen, Khalid Pervez, Rizwan Wahab, Ali Saber Abdelhameed, **Arun Chauhan**. Biophysical Interactions of Novel Oleic Acid Conjugate and its Anticancer Potential in HeLa Cells. **J Fluoresc**. 2015 May;25(3):519-25. doi: 10.1007/s10895-015-1512-6. Epub 2015 Feb 1.
17. Azmat Ali Khan, Mumtaz Jabeen, **Arun Chauhan**, Mohammad Owais. Vaccine potential of cytosolic proteins loaded fibrin microspheres of *Cryptococcus neoformans* in BALB/c mice. **Journal of Drug Targeting**. June 2012, Vol. 20, No. 5, Pages 453-46. (doi:10.3109/1061186X.2012.685474).
18. Khan AA, Alanazi AM, Jabeen M, **Chauhan A**, Abdelhameed AS. Design, synthesis and in vitro anticancer evaluation of a stearic acid-based ester conjugate. **Anticancer Res**. 2013 Jun;33(6):2517-24.
19. Farazuddin, M., **Chauhan, A.**, Owais, M. (2011) Amoxicillin bearing micro-particles: potential in treatment of *Listeria monocytogenes* infection in Swiss albino mice **Bio-Science Reports** 31(4): 265-72.
20. Arif K, Ejaj A, Maroof A, Azmat AK, **Arun C**, Fatima N, Gatoo MA, Owais M. Protective effect of liposomal formulation of tuftsin (a naturally occurring tetrapeptide) against cyclophosphamide-

induced genotoxicity and oxidative stress in mice. **Indian J Biochem Biophys.** 2009 Feb;46(1):45-52.

Manuscript Communicated

21. Arun Chauhan*, Kai Gao*, Abbas Ata, Jyotika Sharma, Junguk Hurr, and Bibhuti B Mishra. Acquired Promoter-proximal enrichment controls induction of M1- functional phenotype in macrophages (**Nature Immunology**).
22. Arun Chauhan, Jitendra K. Tripathi, Atul Sharma, Yuyang Sun, Pramod Sukumran, Brij B. Singh, Bibhuti, B. Mishra and Jyotika Sharma. Helminth derived factors inhibit neutrophil extracellular trap formation and inflammation in bacterial peritonitis. (**Scientific reports**) Submission ID 6a4685e7-24b5-4ee9-a519-02acc8ad0534.

Manuscript in Preparation

23. Quenum Zangbede, F.O., **Chauhan, A.**, Walth, C., Sharma, J., Mishra, B.B., Galectin-7 regulates infiltration of alternatively activated macrophages into the central nervous system during brain parasitic infection.
24. Chauhan, P.*, Quenum Zangbede, F.O.*, Sun, Y., Sukumaran, P.K., Mahmoud, A., **Chauhan, A.**, Sharma, J., Singh, B.B., and Mishra, B.B., Galectin-3 plays a protective role in mouse model of alum-induced Sjögren's syndrome by regulating ectopic lymphoid follicles.
25. Chauhan, P., **Chauhan, A.**, Quenum Zangbede, F.O., Sun, Y., Sukumaran, P.K., Mahmoud, A., Sharma, J., Singh, B.B., and Mishra, B.B., Galectin-9 inhibits salivary gland inflammation and pathology in mouse model of Sjögren's syndrome.

Book Chapter

26. Mohammad Owais, Mairaj Ahmed Ansari, Iqbal Ahmad, Qamar Zia, Gerald Pierard, and **Arun Chauhan**. Innate Immunity in Pathogenesis and Treatment of Dermatomycosis "**Combating Fungal Infections: Problems and Remedy**", eds. Ahmed I, Owais M, Shahid M and Aqil F, Springerlink, New York, USA. 2010; 347-371.

CONFERENCE CONTRIBUTIONS

Conference Proceedings, Talks/Poster Presentation and Published Abstracts:

1. **Chauhan A**, Zubair S, Tufail S, Sherwani A, Sajid M, Raman SC, Amir A, Owais M. "Fungus-mediated biological synthesis of gold nanoparticles: potential in detection of liver cancer". Advance in molecular techniques & their application in health & disease. JALMA, 30th – 1st Dec 2011. Agra. Presenter: Arun Chauhan
2. **Chauhan A**, Zubair S, Nadeem A, Ansari SA, Ansari MY, Owais M. "POTENTIAL OF NOVEL siRNA NANO FORMULATIONS IN TREATMENT OF SKIN AND LIVER CANCER". *International Liposome Research Days & Lipids, Liposomes & Membrane Biophysics* Vancouver, BC, August 4- 8, 2010, Canada.
3. **Chauhan A**, Ravi Kant R, Farazuddin M, Abida M and Owais Mohammad. "Escheriosome mediated cytosolic delivery of Candida albicans cytosolic proteins induce enhanced cytotoxic T lymphocyte response and protective immunity." *World Congress on Biotechnology. 21-23 March 2011 Hyderabad, India*. Presenter: Ravi Kant.

4. **Chauhan A**, Quenumzangbe F, Nechaev S, Singh BB, Sharma J, Mishra BB. "Epigenetic modulation of macrophage inflammatory gene loci at acetyl Histone k9/k14 in helminth induced immune suppression: Implications for immune regulation in neurocysticercosis". UND Epigenetics and Epigenomics Symposium. University of North Dakota the Ralph, Grand Forks, ND--58203 Thursday OCTOBER 2nd, 2014. USA. Presenter: Arun Chauhan
5. **Chauhan A**, Quenumzangbe F, Nechaev S, Singh BB, Sharma J, Mishra BB. "Epigenetic modulation of macrophage inflammatory gene loci in helminth induced immune suppression: Implications for immune regulation in neurocysticercosis". Frank Low Research Day, University of North Dakota. April 2015. USA. Presenter: Arun Chauhan
6. **Chauhan A**, Farazuddin M, Abida M and Owais Mohammad. "Escheriosome mediated cytosolic delivery of *Candida albicans* cytosolic proteins induce enhanced cytotoxic T lymphocyte response and protective immunity. National symposium on "Biomolecular interaction & Drug Discovery" and annual workshop on "Bioinformatics in Drug Design". March 21-22, 2012, AMU, Aligarh, India.
7. FQ Zangbede, **A Chauhan**, J Sharma, BB Mishra. Galectin-7 regulates infiltration of alternatively activated macrophages into the central nervous system. *The Journal of Immunology* 198 (1 Supplement), 143.4-143.4
8. **Arun Chauhan**, Yuyang Sun, Pramod Sukumaran, Freddie O. QuenumZangbede, Christopher N. Jondle, Jyotika Sharma, Brij B Singh, Bibhuti B Mishra. M1 macrophage polarization is dependent on TRPC1-mediated calcium entry. North Dakota Academy of Science 109th Annual Meeting April 28-29, 2017 Grand Forks, ND.
9. **Arun Chauhan**, Yuyang Sun, Pramod Sukumaran, Freddie O. QuenumZangbede, Christopher N. Jondle, Jyotika Sharma, Brij B Singh, Bibhuti B Mishra. M1 macrophage polarization is dependent on TRPC1-mediated calcium entry. Fourth Annual Biomedical Sciences Graduate Retreat. Turtle River State Park, Arvilla, ND Saturday August 19th 2017.
10. FQ Zangbede, **A Chauhan**, J Sharma, BB Mishra. Galectin-3 in Alternatively Activated Macrophages Regulates Neutrophil Turnover and Plays a Protective Role in Resolution of Neuropathology in Brain Parasitic Infection: 20th Annual Woods Hole Immunoparasitology (WHIP) Meeting conference, April 18 - 21, 2016, poster presentation.

Travel Awards

- Recipient of Travel award for Targeted Quantitative Proteomics workshop, April 17 and 18, 2018 National Proteomics Resources, Oklahoma INBARE.

Professional endeavors

- Actively involved in training of various tools and techniques related to cell and molecular biology, epigenetic etc to under-graduate students at University of North Dakota, USA. (2013 – present)
- Supervised various graduate thesis projects for MS students at Interdisciplinary Biotechnology Unit, Aligarh Muslim University, India. (2009 – 2012)