

## **Dr VIJAY KUMAR**

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### **Research Interest:**

- Infection, Immunity and Inflammation

### **Research Experience:**

- More than 8 years (1<sup>st</sup> September 2009- continuing) of postdoctoral research experience in the field of acute bacterial infection pathogenesis (i.e. pneumonia, sepsis, peritonitis etc.), innate immunity (i.e. mast cells, macrophages, neutrophils etc.) and autoimmune inflammatory disorders [i.e. inflammatory bowel disease (IBD), chronic multifocal osteomyelitis (CMO)], allergy in various animal models (i.e. mice, rats and rabbits etc.).

### **Present and Past Positions:**

- **Research fellow (Academic Level-B)/Lecturer** in the bacterial sepsis in Children's Health Queensland Clinical Unit, School of Clinical Medicine, Mater Research, University of Queensland, Brisbane, Queensland, Australia.
- **Postdoctoral Scientist** (1<sup>st</sup> December 2013 - 30<sup>th</sup> November 2014), worked as postdoctoral scientist in the department of Translation Immunology, school of clinical medicine, Trinity College, Dublin, University of Dublin, Ireland on paediatric research in translational immunology (PRiTI) project.
- **Postdoctoral Fellowship** (1<sup>st</sup> November 2012 - 30<sup>th</sup> October 2013) in the department of Otolaryngology and Head and Neck Surgery, Sunnybrook health science centre, University of Toronto, Toronto, Ontario, Canada. This project involved inflammatory toxic damage to auditory hair cells and spiral ganglion neurons (SGNs) and their regeneration.
- **Postdoctoral Fellowship** (1<sup>st</sup> September 2010 - 30<sup>th</sup> October 2012) in the department of cancer biology and genetics, cancer research institute, Queen's University, Kingston, Ontario, Canada in the field of acute bacterial infection (i.e. peritonitis) and innate immunity. This project was mainly focused on finding out the role of calpain 1 and 2 in the early phase innate immune response (i.e. macrophages, neutrophils and mast cells regulation) during acute inflammatory immune response observed in calpain 1 & 2 conditional knockout (KO)

mice suffering from acute bacterial peritonitis. Second project involved exploring the role of SHP2 deficient mast cells in the development of skin inflammation observed during allergy (i.e. Delayed type hypersensitivity) in SH2 Domain-Containing Phosphatase 2 (SHP2) deficient mast cells in mice (i.e. MC-shp2 knockout mice).

- **Postdoctoral Fellowship** (1<sup>st</sup> September 2009 - 31<sup>st</sup> August 2010) in faculty of medicine, department of paediatrics, Saint-Justine Hospital, University of Montreal, Montreal, Canada. This research work at Sainte-Justine Hospital was focused on paediatric patients of inflammatory bowel disease (IBD), an autoimmune disease. Focused on correlation of *ptpn2* and *muc19* genes with the pathogenesis of IBD.

### **Educational details:**

- **PhD** (Medical Microbiology and Immunology) (1<sup>st</sup> August 2004-12<sup>th</sup> June 2009) (Thesis Title: Thalidomide and Clarithromycin: Immunomodulatory effect in *Klebsiella pneumoniae* B5055 induced infection in BALB/c mice) from the department of Microbiology, Panjab University, Chandigarh, India.
- **MSc** (Toxicology) (1<sup>st</sup> July 2001-3<sup>rd</sup> February 2004) passed with 68.08% (first division) from department of Medical Elementology and Toxicology, Jamia Hamdard (Hamdard University), New Delhi, India.
- **BSc** (Botany, Zoology and Chemistry) (1<sup>st</sup> July 1998-19<sup>th</sup> June 2001) passed with first division (68.15%) from DAV College, affiliated with Panjab University, Chandigarh, India.

### **Grants and Fellowships:**

- Got Australian infectious disease (AID) research centre seeding grant for the project entitled “*Therapeutic targeting of the complement C5a-C5aR axis during acute bacterial sepsis*” (2016-2017). The grant money comprises of \$50,000.
- Is there a potential therapeutic role for Eph/ephrin signalling blockade in patients with septic shock? (2016–2017) Bayer Pharma AG
- Queen’s University, Kingston, ON, Canada, Postdoctoral Fellowship (2011-2012) salary of \$50,000 CAD.
- Indian Council for Medical Research (ICMR), New Delhi, India, Senior Research Fellowship (SRF) (1<sup>st</sup> August 2006-31<sup>st</sup> March 2009) \$20,000.00
- Indian Council for Medical Research (ICMR), New Delhi, India, Junior Research Fellowship (JRF) (1<sup>st</sup> August 2004- 31<sup>st</sup> July 2006) \$15,000.00

## **Publications:**

### **Book:**

- Title: **Sepsis**. Editor, **Dr Vijay Kumar**. Publisher, InTech Open Access. ISBN 978-953-51-3396-4, Print ISBN 978-953-51-3395-7, 158 pages. Published on 23<sup>rd</sup> August 2017.

### **Book Chapter (By Invitation):**

- **Kumar V**. Innate Immune system in Sepsis Immunopathogenesis and its modulation as future therapeutic approach. Book Title Inflammatory Diseases - Immunopathology, Clinical and Pharmacological Bases. February 2012. ISBN 978-953-307-911-0.

### **Editorial:**

- **Kumar V**. Innate lymphoid cells: immunoregulatory cells of mucosal inflammation. European Journal of Inflammation. 2014; 12(1): 11-20.

### **Research and Review Articles:**

1. **Kumar V**. Immunometabolism: The future of sepsis research and its therapeutic targeting. Intensive Care Medicine. (Submitted to the Journal)
2. **Kumar V**. Does T cells immunometabolism a key to understand sepsis immunopathogenesis? European Journal of Cell Biology. (Submitted to the journal).
3. **Kumar V**. Targeting macrophage immunometabolism: Dawn in the darkness of sepsis. International Immunopharmacology (Revision submitted).
4. **Kumar V**. Toll-like receptors in immunity and inflammatory diseases: Past, present and future. International Immunopharmacology (Accepted for publication).
5. **Kumar V**, Ahmad A. Negative regulatory mechanisms regulating Toll-like receptor signalling pathways and sepsis immunopathogenesis. Journal of Leukocyte Biology. (Revision submitted for publication). (**Commissioned review article**).
6. **Kumar V**, Ahmad A. Role of MAIT cells in the immunopathogenesis of inflammatory disease: New players in old game. International Reviews of Immunology. International Reviews of Immunology. 2017 Nov 6:1-21. doi: 10.1080/08830185.2017.1380199. [Epub ahead of print]
7. **Kumar V**, Ahmad A. Targeting Calpains: A novel immunomodulatory approach for microbial infections. European Journal of Pharmacology. 2017; 814: 28-44.

8. **Kumar V**, Hall Chris, Greer P, Craig A. Calpains promote neutrophil recruitment and bacterial clearance in an acute bacterial peritonitis model. *European Journal of Immunology*. 2014; 44(3): 831-841.
9. **Kumar V**. Innate lymphoid cells: new paradigm in immunology of inflammation. *Immunology Letters*. 2014; 157: 23-37.
10. **Kumar V**, Mack DR, Marcil V, Israel D, Krupoves A, Costea I, Lambrette P, Grimard G, Dong J, Seidman EG, Amre DK, Levy E. The MUC19 but not the LRRK2 gene is associated with Crohn's disease in children. *Inflammatory Bowel Disease*. 2013; 19(6): 1254-1259. (Citations 14)
11. Marcil V, Mack DR, **Kumar V**, Faure C, Carlson CS, Beaulieu P, et al., Association between the PTPN2 gene and Crohn's Disease: Dissection of potential causal variants. *Inflammatory Bowel Disease*. 2013; 19(6): 1149-1155.
12. **Kumar V**. Adenosine as an endogenous immunoregulator in cancer pathogenesis: where to go? *Purinergic Signalling*. 2013; 9: 145-165.
13. Sharma N, **Kumar V**, Everingham S, Feng G-S, Hartman K, Roers A, Craig AWB. SH2 domain-containing phosphatase-2 is a critical regulator of mast cell migration, survival, homeostasis. *Molecular and Cellular Biology*. 2012; 32(14): 2653-2663.
14. **Kumar V**, Chhibber S. Acute lung inflammation in *Klebsiella pneumoniae* B5055 induced pneumonia and Sepsis in BALB/ c mice: A comparative study. *Inflammation*. 2011; 34(5): 452-462.
15. **Kumar V**, Chhibber S. Thalidomide: an old drug with new action. *Journal of Chemotherapy*. 2011; 23: 28-36.
16. **Kumar V**, Harjai K, Chhibber S. 2-Chloroadenosine (2-CADO) treatment modulates the pro-inflammatory immune response to prevent acute lung inflammation in BALB/c mice suffering from *Klebsiella pneumoniae* B5055-induced pneumonia. *International Journal of Antimicrobial Agents*. 2010; 35(6): 599-602.
17. **Kumar V**, Chhibber S. Thalidomide treatment modulates macrophage pro-inflammatory function and cytokine levels in *Klebsiella pneumoniae* B5055 induced pneumonia in BALB/c mice. *International Immunopharmacology*. 2010; (10): 777-783.
18. **Kumar V**, Sharma A. Mast cells: emerging innate immune cells with diverse role in immunity. *Molecular Immunology*. 2010; 48(1-3): 14-25.

19. **Kumar V**, Sharma A. Neutrophils: Cinderella of innate immune system. *International Immunopharmacology*. 2010; 10(11): 1325-1334.
20. **Kumar V**, Sharma A. Is neuroimmunomodulation a future therapeutic approach for sepsis? *International Immunopharmacology*. 2010; 10: 9-17.
21. **Kumar V**, Chhibber S. Intravenous treatment with 2-chloroadenosine protects BALB/c mice from *Klebsiella pneumoniae* B5055 induced sepsis by modulating the pro-inflammatory immune response. *Journal of chemotherapy* 2009; 21(6): 639-645.
22. **Kumar V**, Harjai K, Chhibber S. A combination of thalidomide and augmentin protects BALB/c mice suffering from *Klebsiella pneumoniae* B5055 induced sepsis. *Journal of Chemotherapy*. 2009; 21(2): 105-110.
23. **Kumar V**, Sharma A. Adenosine: an endogenous modulator of immune system with therapeutic potential. *European Journal of Pharmacology*. 2009; 616: 7-15.
24. **Kumar V**, Upadhyay S, Medhi B. Impact of impact factor in biomedical research, its use and misuse: an overview. *Singapore Medical Journal*. 2009; 50(8): 752-755.
25. **Kumar V**, Chhibber, S. Anti-inflammatory effect of thalidomide alone or in combination with Augmentin in *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice. *European Journal of Pharmacology*. 2008; 592: 146–150.
26. **Kumar V**, Harjai K, Chhibber S. Effect of Clarithromycin on lung inflammation and alveolar macrophage function in *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice. *Journal of Chemotherapy*. 2008; 20(5): 92-97.
27. **Kumar V**, Sharma A. Innate immunity in sepsis pathogenesis and its modulation: new immunomodulatory targets revealed. *Journal of Chemotherapy*. 2008; 20(6): 79-90.
28. **Kumar V**, Medhi B. Emerging role of uterine natural killer cells in establishing Pregnancy. *Iranian journal of Immunology*. 2008; 5(2):71-81.
29. **Kumar V**, Prakash O, Manpreet S, Sumedh G, Medhi B. Genetic basis of HIV-1 resistance and susceptibility: an approach to understand correlation between human genes and HIV-1 infection. *Indian Journal of Experimental Biology*. 2006; 44(9): 683-692. (Citations 10)
30. Bansal V, **Kumar V**, Medhi B. Future challenges of pharmacogenomics in clinical practice. *JK Science Journal of Medical Education and Research*. 2005, 7; (3).
31. Manpreet S, **Kumar V**, Medhi B. Current approaches to smoking cessation: an overview. *Journal of Indian Medical Science Academy* 2005 April-June.

### **Conference Proceedings:**

1. **Kumar V**, Chhibber B. A comparison of inflammatory innate immune response during *Klebsiella pneumoniae* B5055 induced pneumonia and sepsis. *Cytokines*. 2017; 100: 81-82.
2. **Kumar V**, Chhibber S. A combination of thalidomide and clarithromycin prevents acute lung inflammation in mice suffering from *Klebsiella pneumoniae* B5055 induced pneumonia. *Intensive Care Medicine Experimental*. 2017; 5(Suppl. 1): 37. DOI:10.1186/s40635-017-0149-y.
3. **Kumar V**, Chhibber S. Clarithromycin exerts protective immunomodulatory action during *Klebsiella pneumoniae* B5055 induced pneumonia in BALB/c mice. *Critical Care*. 2016; 20 (Suppl. 3): 357.
4. **Kumar V** et al. EphA2 KO mice survive longer in a mouse model of sepsis. *European Journal of Immunology*. 2016. 46 (Suppl. 1): 406.
5. **Kumar V**, Chhibber S. Thalidomide exerts protective immunomodulatory action during *Klebsiella pneumoniae* B5055-induced acute lung infection in BALB/c mice. *Critical care*. 2014; 18(Suppl. 2): P5 (doi:10.1186/cc14008)
6. **Kumar V**. Potential anti-inflammatory role of 2-chloroadenosine treatment during acute lung inflammation in BALB/c mice suffering from *Klebsiella pneumoniae* B5055-induced acute lung infection. *Critical Care*. 2013; 17(Suppl. 4): P68 (doi:10.1186/cc12967).
7. **Kumar V**, Chhibber S. Thalidomide modulates macrophage-mediated inflammatory innate immune response during *Klebsiella pneumoniae* B5055 infection in BALB/c mice. *Critical Care*. 2012; 16(Suppl. 3): P3 (doi: 10.1186/cc11690).
8. **Kumar V**, Everingham S, Hall Chris, Greer P, Craig. Calpain proteases are required for effective clearance of enterobacteria within the peritoneum of mice to prevent systemic infection. *Journal of Immunology*. 2012; 188: 112.5.
9. Valerie M, Levy E, Mack DR, **Kumar V**, Israel DM, Deslandres C, Faure C, Sinnott D, Siedman EG, Amre DK. The PTPN2 gene and paediatric Crohn's disease: Association with multiple markers and enhanced expression in intestinal inflammation. *Gastroenterology*. 2011; 140(5) Supplement 1: S269-S270.
10. **Kumar V**, Chhibber S. Thalidomide in combination with augmentin (amoxicillin with clavulanic acid) protects BALB/c mice suffering from *Klebsiella pneumoniae* B5055 induced sepsis. *Critical Care*. 2011; 15(Suppl. 3): P28 (doi: 10.1186/cc10397).

11. **Kumar V**, Sharma A, Malhotra V. Development of *Klebsiella pneumoniae* B5055 induced mouse model of sepsis associated brain inflammation in BALB/c mice. *Critical Care*. 2010; 14 (Suppl. 2): P4 (doi: 10.1186/cc9107).
12. **Kumar V**, Chhibber S. A comparison of acute lung inflammation in *Klebsiella pneumoniae* B5055 induced pneumonia and sepsis in BALB/c mice. *Critical Care*. 2009; 13(Suppl. 4): S1.
13. **Kumar V**, Chhibber S. Protective potential of 2-chloroadenosine in *Klebsiella pneumoniae* B5055 induced sepsis in BALB/c mice. *Critical Care*. 2008; 12(Suppl. 5): P2, S1.
14. **Kumar V**, Chhibber S. Effect of Clarithromycin on lung inflammation and alveolar macrophage function in *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice. *FASEB Journal*. 2008; 22: 675.18.

### **Scientific and Technical Skills:**

- Great experience in techniques used in basic Biochemistry, Toxicology, Microbiology, Immunology (i.e. Cellular innate immune response) and Molecular Biology i.e. protein purification techniques, column chromatography, SDS-PAGE, DNA isolation, agarose gel electrophoresis, ELISA, PCR, western blot, mammalian Cell culture (Mast cell and macrophage cell culture along with several standard cells lines), isolation and culture of mouse pulmonary alveolar, peritoneal and bone marrow derived macrophages and mast cells, organ culture (i.e. mouse temporal bones for inner ear hair cells and spiral ganglion neurons (SGNs) culture), flow cytometry, reactive oxygen species (ROS) measurement by flow cytometry in mouse blood cells (i.e. neutrophils, monocytes), fluorescence or confocal microscopy, immunohistochemistry, aseptic animal surgeries as well as mouse microsurgery, cryosectioning of tissues, mouse genotyping.

### **Animal Model Experience:**

- Have an excellent experimental working experience with animal models (i.e. mouse) for bacterial sepsis, pneumonia (*Klebsiella pneumoniae* B5055), sepsis induced brain inflammation, burn wound infection (*Pseudomonas aeruginosa*) as well as rat model of inflammatory bowel Disease (IBD) or Colitis etc.
- Have a great research experience with transgenic and knockout (fes/fer kinase<sup>-/-</sup>, calpain 1&2<sup>-/-</sup>) mouse models of acute bacterial peritonitis, contact hypersensitivity and skin inflammation (CMO mouse model).

- Have great experimental expertise in bone marrow derived mast cell (BMMCs) repopulation into the peritoneal cavity of mast cell deficient mice (Wsh mice) to study the role of mast cells during early phase of acute bacterial peritonitis.
- Familiar with working on mouse models of hearing loss. Isolation and culture of mouse inner ear Utricles for hair cells and spiral ganglion neurons (SGNs).

### **Summer Research Training:**

- Did summer training in the department of Clinical Pharmacology, at Post graduate institute of medical education and research (PGIMER), Chandigarh, India for Six months from 1<sup>st</sup> February 2004- 31<sup>st</sup> July 2004.

### **Awards and Fellowships:**

#### **Travel Awards:**

1. Won **Kishimoto Travel Award** to attend and present the research work entitled “A comparison of inflammatory innate immune response during *Klebsiella pneumoniae* B5055 induced pneumonia and sepsis” at **Cytokine 2017** held at Kanazawa, Japan (29<sup>th</sup> October-2<sup>nd</sup> November 2017).
2. Awarded international sepsis forum (ISF) travel award to attend “**Sepsis 2017: New Successes, New Challenges**” held at Institute of Pasteur, Paris, France (11<sup>th</sup>-13<sup>th</sup> September 2017) for presenting my research work entitled “**A combination of thalidomide and clarithromycin prevents acute lung inflammation in mice suffering from *Klebsiella pneumoniae* B5055 induced pneumonia**”.
3. Awarded international sepsis forum (ISF) travel award to attend “**Sepsis 2016**” held at Institute of Pasteur, Paris, France (6<sup>th</sup>-8<sup>th</sup> December 2016) for presenting my research work entitled “**Clarithromycin exerts protective immunomodulatory action during *Klebsiella pneumoniae* B5055 induced pneumonia in BALB/c mice**”.
4. Awarded Volkswagen foundation’s travel award for invited talk at Herrenhausen conference: “**The Neonatal Window of Opportunity, Early Priming for Life**” at Hanover, Germany (5<sup>th</sup>-7<sup>th</sup> December 2016).
5. Awarded international sepsis forum (ISF) travel award to attend “Sepsis 2014” held at Institute of Pasteur, Paris, France (3<sup>rd</sup>-5<sup>th</sup> December 2014) for presenting my research work entitled “**Thalidomide exerts protective immunomodulatory action during *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice**”.

6. Won international sepsis forum (ISF) travel award to attend “Sepsis 2013” held in Rio De Janeiro, Brazil (5<sup>th</sup>-6<sup>th</sup> Nov 2013) for presenting the research work entitled “**Potential anti-inflammatory role of 2-Chloroadenosine (2-CADO) treatment during acute lung inflammation in BALB/c mice suffering from *Klebsiella pneumoniae* B5055-induced acute lung infection**”. This work was selected as one of best abstract among other five best basic science findings and was offered for oral presentation.
7. Got travel award for attending Volkswagen foundation’s first Herrenhausen conference “Downscaling Science” held at Hanover congress centrum (HCC), Hanover, Germany (12<sup>th</sup>-14<sup>th</sup> December 2012).
8. Won international sepsis forum (ISF) travel award to attend “Sepsis 2012” held at Institute of Pasteur, Paris, France (7<sup>th</sup>-9<sup>th</sup> November 2012) for presenting research work entitled “**Thalidomide modulates macrophages mediated inflammatory innate immune response during *Klebsiella pneumoniae* B5055 infection in BALB/c mice**”.
9. Got Gordon research travel award for attending and participating in GRC conference: “Biology of acute respiratory infections” held at Ventura beach, California, USA (11<sup>th</sup>-16<sup>th</sup> March 2012) to present the research work entitled “**Immunomodulatory effect of thalidomide alone or in combination with augmentin (amoxicillin + clavulanic acid) in *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice**”.
10. Won international sepsis forum (ISF) young investigator and travel award for attending “Sepsis 2011” held at China national convention centre (27<sup>th</sup>-28<sup>th</sup> October 2011, Beijing, China) to present research work entitled “**Thalidomide in combination with augmentin (amoxicillin with clavulanic acid) protects BALB/c mice suffering from *Klebsiella pneumoniae* B5055 induced sepsis**”.
11. Won Roche/nature medicine travel award for attending Roche/nature medicine symposium on cancer immunology and immunotherapy (11<sup>th</sup>-13<sup>th</sup> September 2011), Hoffmann-La Roche, pharma research & early development (pRED), Nutley, New Jersey, USA.
12. Got European federation of immunological societies (EFIS) travel award for attending the workshop “Inflammatory diseases and immune response: Basic Aspects, Novel Approaches, Experimental Models (28<sup>th</sup> September-1<sup>st</sup> October 2010) held in Vienna, Austria” to present the research work entitled “**Lung alveolar macrophages play an important role in acute**

**lung inflammation associated with *Klebsiella pneumoniae* B5055 induced sepsis and pneumonia in BALB/c mice”.**

13. Won international sepsis forum (ISF) young investigator and travel award to attend “Sepsis 2010” held at Institute of Pasteur, Paris, France (1<sup>st</sup>-3<sup>rd</sup> September 2010) for presenting research work entitled “**Development of *Klebsiella pneumoniae* B5055 induced mouse model of sepsis associated brain inflammation in BALB/c mice”.**
14. Won international sepsis forum (ISF) young investigator and travel award to attend “Sepsis 2009” held in Amsterdam, Netherland (11<sup>th</sup>-14<sup>th</sup> November 2009) for presenting research work entitled “**A comparative evaluation of acute lung inflammation in *Klebsiella pneumoniae* B5055 induced pneumonia and sepsis in BALB/ c mice”.**
15. Obtained international sepsis forum (ISF) young investigator and travel award to attend “Sepsis 2008” held in Granada, Spain (19<sup>th</sup>-22<sup>nd</sup> November 2008) for presenting research work “**Protective potential of 2-chloroadenosine in *Klebsiella pneumoniae* B5055 induced sepsis in BALB/c mice”.**

**Best Review Article Award:**

1. Won 2008 “**Piero Periti review article award**” awarded by journal of chemotherapy in the field of immunomodulation and antimicrobials for the article entitled “Innate immunity in sepsis pathogenesis and its modulation: new immunomodulatory targets revealed”.

**Fellowships:**

1. Obtained Indian council for medical research sponsored junior research fellowship (ICMR-JRF) for the period 1<sup>st</sup> August 2004-31<sup>st</sup> July 2006
2. Received senior research fellowship from Indian council for medical research (ICMR-SRF) from 1<sup>st</sup> August 2006-31<sup>st</sup> March 2009.
3. Qualified Indian council for medical research-junior research fellowship (ICMR-JRF) examination in June 2004 conducted by ICMR-New Delhi, India.
4. Qualified Council for scientific and industrial research-junior research fellowship (CSIR-JRF) examination held in june-2004.

**Academic Achievements:**

- Aggregate First topper in annual BSc (III) examination (1<sup>st</sup> July 1998-19<sup>th</sup> June 2001) at DAV College (Panjab University), Chandigarh, India.
- Stood First in BSc (III) in December examination (2000) conducted by DAV College,

Chandigarh, India.

- Stood Second in BSc (II) in May examination (1999) conducted by DAV College, Chandigarh, India.
- Stood Second in Botany in BSc (I) in University examination (1998) at DAV College, Chandigarh, India.

**Co-curricular Activities:**

- Secured first prize in chemical compound structure identification in BSc (III) contest organized by chemistry department of DAV College, Chandigarh.
- Delivered seminar lecture on “Mechanisms of liver toxicity” at department of Medical Elementology and Toxicology, Jamia Hamdard (Hamdard University), New Delhi, India
- Delivered Seminar lecture on "Motor neuron diseases” mainly focused on Amyotrophic lateral sclerosis (ALS) in the department of Neurology, PGIMER Chandigarh, India.

**Professional Achievements:**

- Served as an Editor for the book entitled “**Sepsis**” under publication by InTech Publisher
- Currently acting as peer reviewer for highly appreciated peer reviewed journals in the field of Pharmacology and Immunology:
  1. British Journal of Pharmacology
  2. Cancer Immunology and Immunotherapy
  3. Cellular and Molecular Immunology
  4. Drug delivery
  5. Immunology
  6. Innate Immunity
  7. Inflammation Research
  8. Immunologic Research
  9. Immunological Investigation
  10. International Immunopharmacology
  11. Journal of Leukocyte Biology
  12. Molecular Pathogenesis
  13. Scientific Reports
  14. Food and Chemical Toxicology.

### **Conferences and Workshops Attended:**

- Attended and participated in 46<sup>th</sup> Australasian Society for Immunology (28<sup>th</sup> November-1<sup>st</sup> December 2017) meeting held in Brisbane, Queensland, Australia for presenting the research work entitled “**EphA4Fc antibody treatment protects C57BL/6 mice from developing bacteraemia and sepsis due to acute enterobacterial peritonitis**”.
- Attended and participated in 5<sup>th</sup> annual meeting of the international cytokine and interferon meeting called Cytokines 2017 held at Kanazawa, Japan (29<sup>th</sup> October 2017-2<sup>nd</sup> November 2017) to present my work entitled “**A Comparison of inflammatory innate immune response during *Klebsiella pneumoniae* B5055 induced pneumonia and sepsis**”.
- Attended and participated in Sepsis 2016 (6<sup>th</sup>-8<sup>th</sup> December 2016) held at Institute of Pasteur, Paris, France for presenting the research work entitled “**Clarithromycin exerts protective immunomodulatory action during *Klebsiella pneumoniae* B5055 induced pneumonia in BALB/c mice**”.
- Attended and participated in Herrenhausen conference: “The Neonatal Window of Opportunity, Early Priming for Life” at Hanover, Germany (5<sup>th</sup>-7<sup>th</sup> December 2016).
- Attended and participated in International Congress of Immunology (ICI) 2016, held at Melbourne, Australia (21<sup>st</sup>-22<sup>nd</sup> August 2016) to present my work entitled “**EphA2 KO mice survive longer in a mouse model of sepsis**”.
- Attended and participated in Sepsis 2014 (3<sup>rd</sup>-5<sup>th</sup> December 2014) held at Institute of Pasteur, Paris, France for presenting the research work entitled “**Thalidomide exerts protective immunomodulatory action during *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice**”. The symposium Sepsis 2014 was organized by international sepsis forum (ISF).
- Attended and participated in ICH-GCP refresher training- investigator responsibilities sponsored by Wellcome Trust-HRB and Clinical research facility held at St. James Hospital, Dublin, Ireland on 20<sup>th</sup> May 2014.
- Attended and participated in symposium entitled “Immunobiology of chronic viral infections” held at Li ka shing knowledge institute, Toronto (4<sup>th</sup> June 2013), organized by Toronto human immunology network.
- Attended and Participated in 1<sup>st</sup> Bruce Kaufman/McGill symposium on immunoregulation

and inflammatory bowel disease (23<sup>rd</sup>-24<sup>th</sup> September 2010) sponsored by Canadian institute of health research (CIHR) in Montreal, Canada to present the research work entitled: **The role of PPTN2 gene in paediatric Crohn's disease: dissecting risk variants and assessing functional impact on Inflammation.**

- Attended and participated in INDO-US symposium on stem cell identification and characterization: role of molecular markers, held at Panjab University, Chandigarh, India on 8<sup>th</sup> February 2007.
- Attended and participated in the 33<sup>rd</sup> annual conference (IMMCON 2007) of Indian immunology Society (IIS) held at All India institute of medical sciences (AIIMS), New-Delhi, India (28<sup>th</sup>-31<sup>st</sup> January 2007) and presented a poster entitled “**NK cells: emerging innate immune cells in establishment of human pregnancy**”.
- Attended and participated in 40<sup>th</sup> annual conference of Indian pharmacological society (IPS) (1<sup>st</sup>-3<sup>rd</sup> November 2007) Changing trends in drug discovery and development, held at National institute of pharmaceutical education and research (NIPER), Mohali (Punjab), India to present a paper entitled “**Anti-inflammatory effect of thalidomide alone or in combination with augmentin in *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice**”.
- Attended and participated in the 32<sup>nd</sup> annual conference (IMMCON 2005) of Indian immunology society (IIS) (24<sup>th</sup>-27<sup>th</sup> November 2005) held at Post graduate institute of medical education and research (PGIMER), Chandigarh, India, to deliver a talk on the topic “**Genetic basis of HIV-1 infection resistance and susceptibility: an approach to understand the correlation of human genes and HIV-1 infection**”.
- Attended the seminar entitled “Stem cell biology and its applications in biomedical sciences” held (19<sup>th</sup> August 2005) at Panjab University, Chandigarh, India.
- Attended and participated in golden jubilee conference of association of physiologists and pharmacologists of India (APPI) (19<sup>th</sup>-22<sup>nd</sup> December 2004) held at National institute of mental health and neurosciences (NIMHANS), Bangalore, India to present a paper entitled “**Future challenges of pharmacogenomics in clinical practice**”.
- Attended DST Sponsored workshop entitled "Prospects of biosensors in modern biology and biotechnological applications" (25<sup>th</sup> October -6<sup>th</sup> November 2004), organized by Panjab University, Chandigarh, India.

- Attended and participated in Indian Science Congress (ISC) held at Panjab University, Chandigarh, India (3<sup>rd</sup>-7<sup>th</sup> January 2004).

**Abstracts Accepted in international conferences:**

- Abstract entitled “Acute lung inflammation in *Klebsiella pneumoniae* B5055-induced pneumonia and sepsis in BALB/c mice: A comparative study” accepted for poster presentation at EMBO/EMBL symposium: new perspectives on immunity to infection (19<sup>th</sup>-22<sup>nd</sup> May 2012) held at EMBL advanced training centre, Heidelberg, Germany.
- Abstract entitled “Calpain proteases are required for effective clearance of enterobacteria within the peritoneum of mice to prevent systemic infection” was accepted for poster presentation and presented at annual meeting of American association of immunologists (4<sup>th</sup>-8<sup>th</sup> May 2012), Boston, Massachusetts, USA.
- Abstract entitled “Thalidomide treatment modulates the pulmonary innate immune response responsible for acute lung injury in BALB/c mice suffering from *Klebsiella pneumoniae* B5055 induced pneumonia” accepted for Poster presentation in world immune regulation meeting-VI (18<sup>th</sup>-21<sup>st</sup> March 2012), held in Davos, Switzerland.
- Abstract entitled “A comparative evaluation of Acute Lung Inflammation in *Klebsiella pneumoniae* B5055 induced Pneumonia and Sepsis in BALB/ c mice” was selected for poster presentation at “Sepsis 2009” held in Amsterdam, Netherland (11<sup>th</sup>-14<sup>th</sup> November 2009).
- Abstract entitled “Adenosine A<sub>2A</sub> receptor agonist (2-chloroadenosine) treatment protects BALB/c mice from *Klebsiella pneumoniae* B5055 induced acute lung infection generated acute lung inflammation” was accepted for poster presentation in a meeting entitled “Frontiers in basic immunology” (1<sup>st</sup> -2<sup>nd</sup> Oct 2009) held at National institute of health (NIH), Bethesda, USA.
- Abstract entitled “Development of *Klebsiella pneumoniae* B5055 induced mouse model of sepsis associated brain inflammation in BALB/c mice” was accepted for poster presentation in 9th world congress on inflammation (2009) held in Tokyo, Japan (6<sup>th</sup>-10<sup>th</sup> July 2009).
- Abstract entitled “Adenosine A<sub>2A</sub> receptor agonist (2-chloroadenosine) treatment modulates pro-inflammatory immune response during the course of *Klebsiella pneumoniae* B5055-induced acute lung infection in BALB/c mice” was accepted for poster presentation in 19th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID) held in Helsinki, Finland (16<sup>th</sup>-19<sup>th</sup> May 2009).

- Abstract entitled “Protective potential of 2-chloroadenosine in *Klebsiella pneumoniae* B5055 induced sepsis in BALB/c mice” was accepted for Poster presentation in annual meeting of International Sepsis Forum “Sepsis 2008” held in Granada, Spain (19<sup>th</sup>-22<sup>nd</sup> November 2008).
- Research work entitled “A combination of thalidomide and augmentin protects BALB/c mice from *Klebsiella pneumoniae* B5055 induced sepsis” was selected for poster presentation at 10<sup>th</sup> Biennial meeting of international endotoxin and innate immunity society (IEIIS), “Microbial structures – host-pathogen interactions and the impact of innate immunity on disease” Edinburgh, UK (30<sup>th</sup> July-1<sup>st</sup> August 2008).
- Research work entitled “Modulation of alveolar macrophage function by thalidomide in *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c” was selected for poster presentation in 5<sup>th</sup> international innate immunity conference held in Charain, Crete, Greece (21<sup>st</sup> -26<sup>th</sup> June 2008).
- Research work entitled “Effect of Clarithromycin on lung inflammation and alveolar macrophage function in *Klebsiella pneumoniae* B5055 induced acute lung infection in BALB/c mice” was selected for poster presentation at “Experimental Biology 2008”, San Diego, USA (5<sup>th</sup>-9<sup>th</sup> April 2008).

#### **Membership to Various Societies**

- Member of American Association of Immunologists, USA
- Member of Society for Leukocyte Biology, USA.
- Member of European Society of Cancer Immunology and Immunotherapy (ESCI), Greece.
- Member of European Society of Reproductive Immunology
- Member of International complement society, USA.
- Member of International Society for Interferon and Cytokine Research, USA.
- Member of International Endotoxin and Innate Immunity Society, USA.
- Member of Inflammation Research Association, USA.
- Member of International Sepsis Forum, USA.
- Member of society of Innate Immunity
- Member of Pulmonary Research Group, USA.
- Member of International Probiotics Association USA.

- Member of Scientific Association of Probiotics and Prebiotics, California, USA.
- Member of International Adhesion Society, USA.