

JAWED IQBAL, PhD

Ramalingaswami Faculty

Multidisciplinary Centre for Advanced Research and Studies (MCARS)

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ACADEMICS:

2009	PhD (Biochemistry)	J. N. Medical College A.M.U., Aligarh (UP), INDIA.
2004	MSc Biotechnology	C.C.S. University Meerut, U.P., INDIA.
2000	BSc (Hons)	A.M.U., Aligarh (UP), INDIA.

RESEARCH INTEREST:

We are interested to work on viruses and host innate response. Previously, we have shown that IFI16 (gamma-interferon-inducible protein 16), a predominantly nuclear protein involved in transcriptional regulation, also functions as an innate immune response DNA sensor and induces the IL-1 β and antiviral type-1 interferon- β (IFN- β) cytokines. We have shown that IFI16, in association with BRCA1, functions as a sequence independent nuclear sensor of episomal dsDNA genomes of KSHV, EBV and HSV-1. Recognition of these herpesvirus genomes resulted in IFI16 acetylation, BRCA1-IFI16-ASC-procaspase-1 inflammasome formation, cytoplasmic translocation, and IL-1 β generation. Acetylated IFI16 also interacted with cytoplasmic STING and induced IFN- β . However, the identity of IFI16 associated nuclear proteins involved in STING activation and the mechanism is not known. Mass spectrometry of proteins precipitated by anti-IFI16 antibodies from uninfected endothelial cell nuclear lysate revealed that histone H2B interacts with IFI16. Our studies demonstrated that histone H2B is associated with IFI16 and BRCA1 in the nucleus in physiological conditions. *De novo* KSHV and HSV-1 infection as well as latent KSHV and EBV infection induces the cytoplasmic distribution of H2B-IFI16, H2B-BRCA1 and IFI16-ASC complexes. H2B is critical in KSHV and HSV-1 genome recognition by IFI16 during *de novo* infection. Viral genome sensing by IFI16-H2B-BRCA1 leads to BRCA1 dependent recruitment of p300, and acetylation of H2B and IFI16. BRCA1 knockdown or inhibition of p300 abrogated the acetylation of H2B-IFI16 or H2B. Ran-GTP protein mediated the translocation of acetylated H2B and IFI16 to the cytoplasm along with BRCA1. The H2B-IFI16-BRCA1 complex interacted with cGAS and STING in the cytoplasm leading to TBK1 and IRF3 phosphorylation, nuclear translocation of pIRF3 and IFN- β production. These studies identify H2B as an innate nuclear sensor mediating a novel extra chromosomal function, and reveal that two IFI16 complexes mediate KSHV and HSV-1 genome recognition responses, with recognition by the IFI16-BRCA1-H2B complex resulting in IFN- β responses and recognition by IFI16-BRCA1 resulting in inflammasome responses. We are interested to discover that how viruses evade antiviral defense mechanism to stay longer in the host cells for further consequences by manipulating immune system. Also, we are interested in HCV, HBV and coronavirus genome sensing by host proteins and anti-viral response.

PROFESSIONAL EXPERIENCES:

- **Postdoctoral Research Associate and Senior Postdoctoral Research Associate (Jan 2011-Jun 2017)**
CMS, Illinois, USA

During my Research position, I worked on Herpes viruses (KSHV, HSV-1&2 and EBV) and host innate immune response. I have investigated IFI16 associating nuclear protein histone H2B and their critical involvement in KSHV/HSV-1 induced IFN- β production. Apart from the nuclear function of H2B, it also has extrachromosomal function during KSHV/HSV-1 *de novo* infection. We have demonstrated that H2B along with IFI16 associate with herpes virus genome in the nucleus and induce cytoplasmic IFN- β function.

- **Dr. D.S. Kothari Postdoctoral Fellow (July 2009- Jan 2011)**

Interdisciplinary Biotechnology Unit, A.M.U., Aligarh. (U.P.) India.

Title: "To Determine the Possible Mechanism of Antimicrobial Agents Isolated from Medicinal Plants against *Candida Species*" under guidance of Dr. Asad U. Khan (Professor).

- **Ph.D (2005- 2009)**

Department Biochemistry, J.N. Medical College, A.M.U., Aligarh (U.P.) India.

Title: "A Study on the Role of Reactive Oxygen Intermediates (ROI), and Reactive Nitrogen Intermediates (RNI) in *tuberculosis*" under supervision of Prof. Najmul Islam.

- **MSc. Dissertation (Jul-Sept 2003)**

Indian Institute of Toxicology Research (I.I.T.R.), Division of Environmental Microbiology, I.I.T.R.-Lucknow, U.P. India.

Title: "Bacterial Characterization and community structure of tannery effluents treatment plant" under supervision of Dr. Ram Chandra (Senior Principal Scientist).

- **MSc. Summer Training (Jul-Sept 2004)**

Department Biochemistry, J.N. Medical College, A.M.U., Aligarh (U.P.) India.

Title: "To probe the presence of circulating Mycobacterium tuberculosis antigen in the serum of patients with tuberculosis" under supervision of Dr. Najmul Islam (Professor).

RESEARCH GRANTS:

1. Early career Research Award (ECRA) grant of INR 57.49715 lakhs has been awarded by SERB, Science & Technology, Govt. of India (File No. ECR/2018/002114) on 28th Mar, 2019 to work on the project entitled "To investigate the critical role of Osteopontin (OPN) on MAVS-mediated HCV replication, assembly and impaired innate response during HCV infection".

2. Ramalingaswami Fellowship grant of INR 101.91 Lakhs has been awarded (BT/RLF/Re-entry/09/2015) for 5 years (Start date: 14/07/2-17) by department of Biotechnology (DBT), Govt. of India to work on “Critical role of Mitochondria in Hepatitis C virus replication, assembly and innate response”.

PUBLICATIONS:

1. Beg S, Kawish SM, Panda SK, Alwabli AS, Malik A, Afaq S, Al-Samghan AS, **Iqbal J**, Alam K, Rahman M. Nanomedicinal Strategies as Efficient Therapeutic Interventions for Delivery of Cancer Vaccines. **Semin Cancer Biol.** 2019 Oct 13. <https://doi.org/10.1016/j.semcancer.2019.10.005>. Review.
2. **Iqbal J**, Hasan W, Mahdi A.A, and Islam N. Nimbidin suppresses Mycobacterium tuberculosis 85B mRNA in human monocytes. **Biochem. Cell Arch.** 2019, Vol. 19, No. 1, pp. 271-280.
3. Khan SN, Khan S, **Iqbal J**, Khan R, and Khan AU. Enhanced killing and antibiofilm activity of encapsulated cinnamaldehyde (CNMA) against *Candida albicans*. **Frontiers in Microbiology**, 2017 8:1641. doi: 10.3389/fmicb.2017.01641.
4. **Iqbal J**, Hasan W, Fatima Z, Mahdi A.A, and Islam N. Nimbidin-induced downregulation of the TNF- α mRNA in human monocytes infected with Mycobacterium Tuberculosis, **IJDR**, 2017, Vol. 07, Issue, 09, pp.15501-15508.
5. **Iqbal J**, Ansari MA, Kumar B, Dutta D, Roy A, Chikoti L, Pisano G, Dutta S, Vahedi S, Veettil MV and Chandran B. Histone H2B-IFI16 Recognition of Nuclear Herpesviral Genome Induces Cytoplasmic Interferon- β responses. **PloS Pathogen**, 2016;12(10):e1005967.
6. Kumar B, Dutta D, **Iqbal J**, Ansari MA, Roy A, Chikoti L, Pisano G, Veettil MV and Chandran B. ESCRT- I Protein Tsg101 Plays a Role in the Post-Macropinocytic Trafficking and Infection of Endothelial Cells by Kaposi's Sarcoma-Associated Herpesvirus". **PloS pathogen**, 2016; 12(10):e1005960.
7. Roy A, Dutta D, **Iqbal J**, Pisano G, Gjyshi O, Ansari MA, Kumar B, Chandran B. Nuclear Innate Immune DNA Sensor IFI16 is Degraded During Lytic Reactivation of Kaposi's Sarcoma-Associated Herpesvirus (KSHV): Role of IFI16 in Maintenance of KSHV Latency. **J. Virol.** 90(19):8822-41, 2016.
8. Veettil MV, Kumar B, Ansari MA, Dutta D, **Iqbal J**, Gjyshi O, Bottero V, and Chandran B. ESCRT-0 Component Hrs Promotes Macropinocytosis of Kaposi's Sarcoma-Associated Herpesvirus in Human Dermal Microvascular Endothelial Cells. **J. Virol**; JVI02704-15.
9. Ansari MA, , Dutta S, Veettil MV, Dutta D, **Iqbal J**, Chikoti L, Singh VV, Chandran B. Acetylation of IFI16 after recognition of nuclear herpesvirus genome is essential for its innate inflammasome, IL-1 β and IFN- β response. **PLoS Pathogen** (2015; 11 (7):e1005019).
10. Dutta D, Dutta S, Veettil MV, Roy A, Ansari MA, **Iqbal J**, Chikoti L, Johnson KE, Chandran B. BRCA1 regulates IFI16 mediated nuclear innate sensing of viral DNA and subsequent induction of innate inflammasome and Interferon- β responses. **PloS Pathogen** (2015;11(6):e1005030.

11. Hasan N, Siddiqui M. U, Toossi Z, Khan S, **Iqbal J**, and Islam N. Allicin-induced suppression of *Mycobacterium tuberculosis* 85B mRNA in human monocytes. **Biochem Biophys Res Comm** (2007) 355: 471-476.

Supplements and Precedings:

12. Islam N, **Iqbal J**, Hasan N, Fatima Z, Thakur H, Hasan N, Mahdi A.A, Khan T, Bano F, and Ansari I.A. Allicin from garlic suppresses TNF- α and augments IFN- γ expressions in monocyte cultures from patients with Vaginitis. **Nature Precedings**, 2008.
13. **Iqbal J**, Kumar A and Islam N. *Azadirachta indica* induced suppression of *Mycobacterium tuberculosis* secreted proteins in human monocyte. **Nature Precedings**, 2008.
14. Islam N and Iqbal J. *Azadirachta indica* extract-induced suppression of iNOS mRNA and *Mycobacterium tuberculosis* 85B mRNA in MTB-infected human monocytes. *Nitric Oxide* (2008) Vol. 19 (Supl.).
15. **Iqbal J**, Kumar A and Islam N. *Azadirachta indica* induced suppression of *Mycobacterium tuberculosis* secreted proteins in human monocyte. *Indian Journal of Clinical Biochemistry* (2007) Vol. 22 (Supl.).

BOOK CHAPTERS:

1. Khursheed ul Islam and **Jawed Iqbal***. Chapter 12 on “Hepatitis C Virus and Innate Interferon Response: Pathogen Biology, Drug Resistance, Novel Drug Targets, and Therapeutic Strategies” under the book titled “Book Title: Pathogenicity and Drug resistance of Human Pathogens”, ISBN:978-981-32-9448-6, Springer Nature, 2019.
2. Islam, N. and **Iqbal, J**. Chapter 19 on Immune System and Tumor Immunology (pp:204-212): *Text Book of Immunology*; Ed. by Gupta, B. K. and Sharma, A.; PeePee Publishing House, New Delhi, 2012.
3. **Iqbal J*** and Ahemad M. Chapter 14 on “Recent advances in bacteria-assisted phytoremediation of heavy metals from contaminated soil” (pp 401-423), CRC Press, Taylor & Francis Books Inc, USA, 2015.
4. Ahemad M and **Iqbal J***. Chapter on “Phosphate solubilizing bacteria as plant-growth-promoters and accelerators of phytoremediation”, CRC Press, Taylor & Francis Books Inc, USA, (ISBN: 9781351665636), 2017.

MENTORSHIP AND SUPERVISION:

1. Khursheed ul Islam Ganaie - PhD student (Ongoing)
2. Saleem Anwar - PhD student (Ongoing)
3. MD Iqbal Azmi - PhD student (Ongoing)
4. Sneh Prabha - Project JRF (Ongoing)

TEACHING:

- Teaching PhD course work (Molecular Virology).

- Teaching to students of Post Graduate Diploma in Molecular Diagnostics (Molecular Genetics and Immunodiagnosics).

MEMBER IN RESEARCH ADVISORY COMMITTEE (RAC) OF PHD STUDENTS:

- Zahoor Ahmed Bhat - PhD student (Ongoing)
- Shabina Qadir - PhD student (Ongoing)
- Md Imam Faizan - PhD student (Ongoing)

ACADEMIC AND PROFESSIONAL AWARDS/HONORS/CERTIFICATIONS:

1. Early career Research Award (ECRA) on 28th Mar, 2019 by Science and Engineering Research Board (SERB), Science & Technology, Govt. of India.
2. **Ramalingaswami Re-entry fellowship** awarded by Department of Biotechnology (DBT) on 20th Oct 2016 in the Department of Bioscience, Jamia Millia Islamia University., New Delhi, INDIA.
3. **Dr. D.S Kothari Postdoctoral Fellowship** awarded by University Grants Commission on 25th May 2009 for 3 years in the Interdisciplinary Biotechnology Unit, Aligarh Muslim University., Aligarh (UP) INDIA.
4. **Best poster award** in International Symposium on the Predictive, Preventive and Mechanistic Mutagenesis & XXXIII EMSI Annual Meeting, 1-3 January, 2008 Aligarh Muslim University, Aligarh (UP) INDIA.
5. **Allana Scholarship** was awarded by “The Muslim Association for the Advancement of Science” (MAAS) for one year in 2006, Iqra Colony, New Sir Syed nagar Aligarh (UP) INDIA.
6. Scholarship awarded by **AMU Alumni Association, Michigan, USA** in Jan 2007.

TALK:

1. Talk in “International Symposium on Infectious Diseases” at Regional Centre for Biotechnology (Faridabad) and Jamia Hamdard (New Delhi), Nov. 12-14, 2018.
2. Invited Talk at International Conference” on “Future Diagnostic, Therapeutic and Theranostics Modalities" during December 29-31, 2018.
3. Invited talk in National Symposium cum Bioinformatics workshop, March 20-21, 2018 at Interdisciplinary Biotechnology Unit, A.M.U., Aligarh.
4. Talk at Chicago Medical School, North Chicago, IL, USA, Sep. 15, 2016.
5. Talk at Chicago Medical School, North Chicago, IL, USA, April 24, 2014.
6. Talk at Chicago Medical School, North Chicago, IL, USA, April 25, 2013.
7. Talk at Chicago Medical School, North Chicago, IL, USA, Sep. 15, 2012.
8. Talk in National Symposium on Advances in Clinical Biochemistry– Biomarkers, Molecular Diagnosis and Quality Assurances and 1st U.P. Chapter of Association of Clinical Biochemists of India, Nov. 15-16th, 2008 (UPACBICON).

PUBLISHED ABSTRACTS/POSTERS IN CONFERENCES:

1. MD Iqbal Azmi, Syed Naqui Kazim and **Jawed Iqbal**, Integrin- β 1 receptor mediated signalling cascades in presence of Hepatitis B virus X protein in hepatoma cell lines. "National Conference on Recent Advances in Biological Sciences on 5th March, 2020 (NCRABS-2020), at Department of Biosciences, Jamia Millia Islamia, New Delhi-110025.
2. Saleem Anwar and **Jawed Iqbal**, Role of cGAS-STING-mediated antiviral signaling pathways during Hepatitis C virus infection in hepatoma cell lines. "National Conference on Recent Advances in Biological Sciences on 5th March, 2020 (NCRABS-2020), at Department of Biosciences, Jamia Millia Islamia, New Delhi-110025.
3. Khursheet ul Islam and **Jawed Iqbal**, MAVS-mediated antiviral signalling pathways during HCV infection in hepatoma cell lines. "National Conference on Recent Advances in Biological Sciences on 5th March, 2020 (NCRABS-2020), at Department of Biosciences, Jamia Millia Islamia, New Delhi-110025.
4. **Iqbal J.** Histone-H2B Recognition of Nuclear Herpesviral Genomes Induces Cytoplasmic Inteferon- β responses. Chicago Area Virology Association Symposium (CAVA), Nov 11, 2016, IL, USA.
5. **Iqbal J.** Histone-H2B Recognition of Nuclear Herpesviral Genomes Induces Cytoplasmic Inteferon- β responses. Young Investigators Meeting Chicago, Oct. 21-23, 2016, Chicago, IL, USA.
6. Kumar B, Dutta D, **Iqbal J**, Ansari MA, Roy A, Chikoti L, Pisano G, Veettil MV and Chandran B. ESCRT- I Protein Tsg101 Plays a Role in the Post-Macropinocytic Trafficking and Infection of Endothelial Cells by Kaposi's Sarcoma-Associated Herpesvirus". 41th Annual International Herpesvirus Workshop, Madison, WI, July 23-27, 2016, USA.
7. Ansari MA, Kumar B, **Iqbal J**, Dutta D, Roy A, Pisano G, Chikoti L and Chandran B. HSV-2 *de novo* infection induces IFI16 and NALP3 inflammasome mediated IL-1 β and IFI16 mediated interferon- β innate immune responses. 41th Annual International Herpesvirus Workshop, Madison, WI, July 23-27, 2016, USA.
8. Roy A, Dutta D, **Iqbal J**, Pisano G, Gjyshi O, Ansari MA, Kumar B, Chandran B. Nuclear Innate Immune DNA Sensor IFI16 is Degraded During Lytic Reactivation of Kaposi's Sarcoma-Associated Herpesvirus (KSHV): Role of IFI16 in Maintenance of KSHV Latency. 41th Annual International Herpesvirus Workshop, Madison, WI, July 23-27, 2016, USA.
9. Ansari MA, Dutta S, Veettil MV, Dutta D, **Iqbal J**, Roy A, Kumar B, Chikoti L, Singh V and Chandran B. Herpesvirus Genome Recognition Induced Acetylation of Nuclear IFI16 Is Essential For Its Cytoplasmic Translocation, Inflammasome and IFN- β Response". 40th Annual International Herpesvirus Workshop, Boise, Idaho, July 29, 2015, USA.
10. Dutta S, Dutta S, Veettil MV, Roy A, Ansari MA, **Iqbal J**, Chikoti L, Johnson J and Chandran B. BRCA1 Regulates IFI16 Mediated Nuclear Innate Sensing of Herpes Viral DNA and Subsequent Induction of the Innate Inflammasome and Interferon- β Response. 40th Annual International Herpesvirus Workshop, Boise, Idaho, July 29, 2015, USA.

11. Islam N, Zeeshan Fatima and **Iqbal J**. “Suppression of *Mycobacterium tuberculosis* 85B mRNA and TNF- α mRNA in human monocyte by *Azadirachta indica* extract. National Conference on Emerging Trends in Biochemistry and Satellite Symposium of the Academy of Environmental Biology, Jan, 23-24, 2010, INDIA.
12. **Iqbal J** and Islam N. “Neem Extract- induced modulation of MDA levels in human monocyte infected with *Mycobacterium tuberculosis*”. 8th Annual Meeting of the Society for Free Radical Research-India March 19-21, (SFRR-2009), INDIA.
13. Islam N, Fatima Z and **Iqbal J**. Epigallocatechin-3-gallate- a green tea polyphenol and natural antioxidant may serve as an adjunct in the management of tuberculosis. 8th Annual Meeting of the Society for Free Radical Research – India March 19-21, (SFRR-2009), INDIA..
14. **Iqbal J** and Islam N. “Effect of neem extract on host TNF- α and M. tuberculosis 85B gene expression in M. tuberculosis-infected monocytes.” National Symposium on Advances in Clinical Biochemistry– Biomarkers, Molecular Diagnosis and Quality Assurances and 1st U.P. Chapter of Association of Clinical Biochemists of India, Nov. 15-16th, 2008 (UPACBICON), A.M.U., Aligarh, INDIA.
15. Tarique M, **Iqbal J** and Afrin F. “Study of Berberine and nano- Berberine in Leishmaniasis”. National Symposium on Advances in Clinical Biochemistry– Biomarkers, Molecular Diagnosis and Quality Assurances and 1st U.P. Chapter of Association of Clinical Biochemists of India, Nov- 15 & 16th, 2008 (UPACBICON), A.M.U., Aligarh, INDIA.
16. **Iqbal J**, Hussain S and Islam N. “Effect of neem extract on the suppression of *Mycobacterium tuberculosis* 85B mRNA and iNOS mRNA in human monocytes”. 5th Indo-Australian Conference on medical Biotechnology National Institute of Immunology. New Delhi 110067 (11 & 12 February, 2008), INDIA.
17. Hussain S, **Iqbal J**, Fatima N, Moin S and Islam N. “Antioxidant- As A Potential Chemopreventive Agent”. 5th -Indo-Australian Conference on medical Biotechnology National Institute of Immunology. New Delhi 110067 (11 & 12 February, 2008), INDIA.
18. **Iqbal J** and Najmul Islam. “*Azadirachta indica* extract -induced suppression of *Mycobacterium tuberculosis* 85B mRNA and TNF- α mRNA in human monocytes.” International Symposium on the Predictive, Preventive and Mechanistic Mutagenesis & XXXIII EMSI Annual Meeting, 1-3 January, 2008 Aligarh Muslim University, INDIA.
19. Islam N, Hasan N, **Iqbal J**, Goyal R, Gupta GK, Khan S, Mahdi A.A, Siddiqui MU, Mahdi F and Hussain S. “New Garlic Technology –A New Hope for Military and Civilian Applications”. South Asian VIIth Annual National Conference of Indian Congress of Forensic Medicine and toxicology, on 24-25th March 2007, J.N. Medical College, A.M.U., Aligarh, INDIA.
20. Hasan N, **Iqbal J**, Islam N. A study on the role of natural antioxidant “Allicin” in autoimmune systemic lupus erythematosus. Society of Biological Chemists (India) 75th Annual Meeting 8-11 December 2006, J.N.U., New Delhi, INDIA.
21. Islam N, Vashney M.K and **Iqbal J**. “Tuberculosis patients expressing high levels of anti-inducible nitric oxide synthase (iNOS) activity exhibited circulating *Mycobacterium* antigen 85B coupled to IgG in serum”. International Conference on

“Antioxidants & Free Radicals in Health-Nutrition & Radio-protectors” and IV Annual Conference of Society for Free Radical Research in India (SFRR), 10-12th January 2005. St John’s National Academy of Health Science, Bangalore, INDIA.

MEMBERSHIP OF SCIENTIFIC SOCIETIES:

- i. European Federation of Biotechnology.
- ii. International Society for Infectious Diseases (ISID).
- iii. World Society for Virology (WSV).

REVIEWER OF JOURNALS:

1. Frontier Journals
2. Mitochondrion Journal
3. PLOS ONE
4. Virology Journal
5. Scientific Reports (NPG)
6. Journal of Clinical Laboratory Analysis
7. Arabian Journal of Chemistry
8. Biochemistry & Molecular Biology
9. Pesticide Biochemistry and Physiology
10. Journal of King Saud University (Science)
11. Jordan Journal of Biological Sciences
12. Emirates Journal of Food and Agriculture
13. Institute of Integrative Omics and Applied Biotechnology (IIOAB)
14. Cell Biochemistry and Biophysics (CBBI)
15. IUBMB Life

ATTENDED CONFERENCES & WORKSHOPS:

1. Organized a webinar on “COVID-19: A Scientific Perspective” on 28th July, 2020 at Multidisciplinary Centre for Advanced Research and Studies Jamia Millia Islamia, New Delhi-110025, India.
2. Attended Webinar on the Response of DBT’s Autonomous Institute to COVID-19-Part-1 on 21st August, 2020.
3. Attended in the Bilateral Indo-US Webinar on COVID Biology, dated August 16-19, 2020 organized by Indian Institute of Science education and Research Kolkata, India in collaboration with IISc, Bangalore, India, University of Pennsylvania, and the University of Colorado, School of Medicine, USA
4. Attended webinar on “Analytical Technologies for COVID-19 Challenges” on 3rd July, 2020.
5. Attended webinar on SPARC Indo-US Immunology workshop jointly organized by IIT-Ropar, India and George Washington University, USA on 12th & 13th June, 2020.
6. Attended Editorial Board Zoominar on Coronavirus Knowledge Hub on 20th May, 2020.

7. Poster presented in International Symposium on Infectious Diseases” at Regional Centre for Biotechnology (Faridabad) and Jamia Hamdard (New Delhi), Nov. 12-14, 2018.
8. Poster presented in Chicago Area Virology Association Symposium (CAVA), Nov 11, 2016, IL, USA.
9. Poster presented in Young Investigators Meeting Chicago, Oct. 21-23, 2016, Chicago, IL, USA.
10. Attended 41th Annual International Herpesvirus Workshop, Madison, WI, July 23-27, 2016, USA.
11. Poster presented in 40th Annual International Herpesvirus Workshop, Boise, Idaho, July 29, 2015, USA.
12. Attended “Chicago Symposium on Cell Signaling”, Chicago, IL, May 21, 2015, USA.
13. Attended “Chicago Symposium on Cell Signaling”, Chicago, IL, July 22, 2014, USA.
14. Poster presented in Advances in Free Radical Research: Natural Products, Antioxidants and Radioprotectors” (AFRR – 2009) & 8th Annual Meeting of the Society for Free Radical Research – India, March 19-21, 2009.
15. Oral presentation in National Symposium on Advances in Clinical Biochemistry– Biomarkers, Molecular Diagnosis and Quality Assurances and 1st U.P. Chapter of Association of Clinical Biochemists of India, Nov. 15-16th, 2008 (UPACBICON).
16. Attended 5Th Indo-Australian Conference on medical Biotechnology, National Institute of Immunology. New Delhi 110067 (11 & 12 February, 2008).
17. Poster presented in International Symposium on the Predictive, Preventive and Mechanistic Mutagenesis & XXXIII EMSI Annual Meeting, 1-3 January, 2008 Aligarh Muslim University, India.
18. Poster presented in 34th National Conference of Association of Clinical Biochemists of India 17th - 20th December, 2007. Escorts Heart Institute & Research Centre Ltd., New Delhi - 110 025.
19. Attended National Workshop on Intellectual Property Right, March 31st -April 1st, 2007, Indian Institute of Technology (I.I.T.), Kanpur.