

Biodata: Professor Rabia Hussain

(email: professorrabiahussain@gmail.com)

EDUCATION

- 1966** B.Sc (Hon). Karachi University. Division 1 Position 1 (summa cum laude)
Subjects: Microbiology, Biochemistry and Botany. (summa cum laude)
- 1967** M.Sc. Karachi University, Division 1, Position
Subject : Microbiology
- 1973** PhD, University of Western Ontario Canada,
Subject: Immunology

Thesis Titles

- 1968.** M.Sc. Thesis: Cross reactions of avian and mammalian gamma globulins,
Karachi University, Pakistan
- 1973.** PhD Thesis: Isolation, purification and characterization of an
Ascaris suum allergen, University of Western Ontario, Canada.

PROFESSIONAL QUALIFICATIONS

- 1989: MRC Path: London, U.K.
Subject: Immunology
- 1997: FRC Path: London, U.K.
Subject: Immunology.

BRIEF CHRONOLOGY OF EMPLOYMENT

1968-69

Assistant Lecturer,
Department of Microbiology,
University of Karachi, Karachi, Pakistan

1970-72

Teaching Assistant,
Department of Bacteriology and Immunology
University of Western Ontario, Canada

1973-75

Research Associate,
National Research Council (USA)
Naval Medical Research Institute,
National Naval Medical Center.

1976-79

Instructor,
Department of Medicine,
John Hopkins University, USA

1979-81

Collaborative Researcher,
National Institutes of Health,
National Institutes of Allergy and Infectious Diseases. USA

1981-85

Senior Staff Fellow,
National Institute of Allergy and Infectious Diseases,
National Institutes of Health, USA.

1985-90

Associate Professor,
Department of Microbiology
The Aga Khan University, Karachi, Pakistan

Jan - March 2005

Acting Chairperson,
Department of Microbiology
The Aga Khan University, Karachi, Pakistan

Jan 1990- 2012

Ghulamali Hirji Professor of Microbiology (retd 2012)
Department of Pathology & Microbiology
The Aga Khan University, Karachi, Pakistan

March 1996-August 1996

Visiting Scientist,
Case Western Reserve University,
Division of Infectious Diseases,
Cleveland, Ohio, USA

January 1, 1999-Jan 2004

Chairperson
Department of Microbiology
The Aga Khan University, Karachi, Pakistan

November 15, 2003:

Designated HEC Distinguished National Professor
Higher Education Commission (HEC)
Islamabad, Pakistan

January 2003-2006 –

Honorary Visiting Professor
AQ Khan Institute of Biotechnology and Genetic Engineering (KIBGE)
University of Karachi

January 24-April 24, 2005

Visiting Professor
Sabbatical leave
AQ Khan Institute of Biotechnology and Genetic Engineering (KIBGE)
University of Karachi

August 27-November 2005

Visiting Professor
sabbatical leave
Division of Hematology and Oncology
University of Massachusetts, Worcester, Ma

November 2005 -2012

Honorary Visiting Professor,

London School of Hygiene and Tropical Medicine,

London, UK

MEDALS, AWARDS AND HONORS

1. **Merit Scholarship** for standing first B.Sc. (Hons). University of Karachi 1966-1967
2. **Gold Medal** for standing first in M.Sc. University of Karachi, 1968
3. **Commonwealth Scholarship**, Government of Canada, 1969-73.
4. **National Research Council Associateship award** Washington, D.C. (1973-1975).
5. **Berson-Yallow Award** for developing a radio-immuno-assay techniques, Society of Nuclear Medicine, June 1980
6. **Rockefeller Biotechnology Fellowship Award** (1986-1988 for 28 weeks), Sponsored by The Rockefeller Foundation, National Institutes of Health, Bethesda, MD and The Aga Khan University.
7. **IUIS Travel Award** (International union of Immunological Societies to attend 8th International Conference of Immunology (August 23-28, 1992).
8. **Tamghe-Imtiaz**: Civil Award for Research/Education in Medicine, Government of Pakistan (1999)
9. Cited in “**Outstanding people of the 20th Century**”. Compiled by the International Bibliographic Center, Cambridge, UK.
10. **The Third World Academy of Sciences (TWAS) Award** in Basic Medical Sciences for the year 2000. (Trieste, Italy).
11. **HEC Distinguished National Professor**, Higher Education Commission, Islamabad, Pakistan (2003)
12. **Sitara-e-Imtiaz**: Civil Award for Research/Education in Medicine, Government of Pakistan (2005)
13. **The Aga Khan Award** in recognition for Pakistan Civil Award Sitara-e-Imtiaz (2005)
14. **The Aga Khan University Research Award** (2006)
15. **Elected Council Member**, International Leprosy Association (December 2007-current)
16. **The Aga Khan University Service Award** for 20 years (2009)
17. **CDC press release on manuscript** before its publication in EID, May 2010
18. Commentary of Medscape Medical News on manuscript published in EID , May 2010 (<http://www.medscape.com/viewarticle/721084>)
19. **Associate Editor, Journal of Immunology (1984-1986);**
20. **Co-Editor, A University's Linkage (1996)**
21. **Editor, Mycobacterial Diseases OMICS Publishing Group (07/11)**
22. **Editor, Medical Journal of Islamic World Academy of Sciences (IAS) (2011-current)**
23. **Service Award (25 years) January 2012)**
24. **Lifetime Achievement Award (Pakistan Society of Pathology-Immunology (December 2012)**

25. **Elected Council member and Vice President(South and Cental Asian region, The Academy of Sciences for Developing World (TWAS) (2013-2016)**
26. **Listed as '*Top-20 Most Influential Women in Science in the Islamic World*'. In the category of *Shapers as number 1*. *Muslim-Science.Com* February 23, 2014**
27. **Member, International Basic Sciences Programme (IBSP) of UNESCO (2015-2018)**
28. **Member, Governing Body of Marie Adelaide Leprosy Center, Pakistan**

SCIENTIFIC SOCIETIES

1. New York Academy of Science (Member)
2. American Association of Immunology(Member)
3. Academy of Allergy and Immunology(Member)
4. American Society of Tropical Medicine and Hygiene(Member)
5. International Leprosy Association (Council Member)
6. British Society of Immunology(Member)
7. **The Academy of Sciences For Developing World (TWAS), Trieste Italy (2001) (Fellow)**
8. **Third World Academy of Women Scientists, Trieste Italy (2001) (Fellow)**
9. **Pakistan Association of Medical Sciences (2000) (Fellow)**
10. **Pakistan Academy of Sciences (2006) (Fellow)**
11. **Elected Council Member, International Leprosy Association (December 2007-current)**
12. **Islamic World Academy of Sciences (2008) (Fellow)**
13. **Pakistan Society of Immunology, Elected Patron (2012-2017)**

TEACHING AND SUPERVISORY EXPERIENCE

Approved FCPS Supervisor and Examiner: College of Physician and Surgeons: recognized FCPS Supervisor and Examiner(1989)

Approved PhD Supervisor: Higher Education Commission (1999)

SUPERVISION

- Supervised Dr. David Marsh's Laboratory during his sabbatical (1976-1977)
- Supervised Dr. Eric Ottesen's Laboratory during his sabbatical (1984-1985)
- Recognized PhD supervisor by the Higher Education Commission Pakistan (2001)

SUMMER STUDENTS (NIH, BETHESDA,USA)

- Andrew Goldstone (1981-1982)
- Elizabeth Mendez (1983)
- James Flores (1984)

PHD STUDENTS (THESIS COMPLETED)

PRINCIPAL SUPERVISOR

1. **Dr Arnawaz Kifayet**, (AKU) funded by WHO/TDR (1991-1993) submitted PhD dissertation in December 1997, University of Karachi, Cleared PhD defense October 1998.: Title: Definition of the character and the role of IgG subclasses in immunopathogenesis of Erythema Nodosum Leprosum (ENL) reaction in leprosy.
2. **Ms Najeeha Talat (PhD completed 2010)**
3. **Ms Ambreen Ansari (completed 2012)**

CO- SUPERVISOR

4. **Dr. Rumina Hasan**, Senior Instructor as (Joint Supervisor with Dr. Hazel Dockrell, London, U.K. (PhD completed 1990): Title: A model for studying the effect of antibodies on monocyte-antigen interactions in leprosy.
5. **Dr Sarwat Jamil** (Joint Supervisor with Dr. Neil Stoker, London, UK. (funded by Lepira): Title: Use of the polymerase chain reaction in leprosy diagnosis and management. (Completed 2003)
6. **Ms Mehnaz Tanveer** (Co- Supervisor, KU registered) (PhD completed 2008)
7. **Ms Ashoo Ali** (PhD Completed 2008)
8. **Ms Najia Ganchi** (PhD completed 08/11)
9. **Ms Kiran Iqbal (AKU) (completed 2013)**
10. **Mr Farhan Raza (AKU) (under progress)**

FCPS STUDENTS (CO-SUPERVISOR)

- Dr Erum Khan. Title: Immuno-diagnosis of extra pulmonary tuberculosis using *Mycobacterium tuberculosis* culture filtrate antigen. (1999)
- Dr Aasim Khan. Title : Study of IgG Subclasses in Amoebic Liver Abscess.(2000)

POST DOCTORAL FELLOWS (NATIONAL INSTITUTES OF HEALTH, BETHESDA MD, USA)

- Dr. Nuzhat Kaushal (1982-1984)
- Dr. Henry Francis (1982-1983)
- Ramesh Paranjape (1983-1984)
- Dr. Celia Maxwell(1984-1985)

WORKSHOPS:

ATTENDED

**1.Workshop series: Enhancing faculty skills for Problem based Learning (PBL) at AKU.
Workshop 4: Workshop for Problem-Based Learning (PBL) Tutorial Facilitation Skills. AKU, ED Hall # 2. March 12 & 15, 2004.**

2.Publications in high impact Journals (organized by AKU-Clinical Epidemiology Unit, CHS in collaboration with the United Health –NHLBI, Feb 2-3, 2010).

PARTICIPATED

3.6th IDEAL workshop. (Beijing, China 23 to -25 August 2010).

ORGANIZED

International Workshop on “ An Update on Pathogenesis of Mycobacterial Diseases” conducted by OIC Standing Committee on Scientific Cooperation (COMSTECH) Islamabad April 25-27, 2012 (Focal point).

ADMINISTRATIVE RESPONSIBILITIES

REVIEWER, INTERNATIONAL JOURNALS

Current: American Journal of Tropical Medicine and Hygiene, Acta Tropica
Journal of Immunology, International Journal of Leprosy, Infection and Immunity,
International Journal of Tuberculosis and Lung Diseases, Clinical Experimental Immunology,
Biomednet Central, Tuberculosis, Journal of Immunological Methods, Immunology, Future
Microbiology, (2011) FEMSIM, Afr J Biotech J, Cytokine, Plos One, EICMID, ARCHMED,
Plos Neglected Tropical Diseases, JCMR, PlosOne

REVIEWER, INTERNATIONAL RESEARCH GRANTS

Grants review: Ad hoc committee for Immuno-parasitology National Institutes of Health, USA (1984).

Agency for International Development (USAID) Parasitology Grants, Review, Chaired by Dr. Wayne Hockmeyer, Walter Reed Hospital, Washington, DC, U.S.A. (1988)

Invited Ad hoc member: WHO Steering Committee on Immunology of Leprosy and Tuberculosis (Geneva: April 25-28, 1990)

Member: WHO Steering Committee on Immunology of Leprosy and Tuberculosis (1992-1998)

Member, Focal Point (Infectious Diseases) of National Research Program for Universities (NRPU) (2005-2007)

Review panel for “Alessandro Liberati Programme” for Young Investigators (2012)

COMMITTEES AND BOARDS

International

Immunogenetics Panel: Academy of Allergy and Immunology, USA (1976-1979).

Allergen Standardization Committee Academy of Allergy and Immunology, USA (1977-1979).

Member, Council for International Society for Infectious Diseases, Boston, USA (1996-2000).

Global TB research Initiative World Health Organization, Geneva, Switzerland (1998)

TB diagnostic Initiative World Health organization, Geneva, Switzerland. (September 1999)

Presentation to the Joint coordinating Board on behalf of TDR, Title: Diagnostic issues of tuberculosis in the developing world (Geneva Switzerland; June 26, 2000)

Tuberculosis diagnostics: Countdown to New Tools consultation, Geneva, Switzerland, (June 28-30, 2000).

Steering Committee of International Consortium on Elimination of Leprosy (Elected member, October 2004-2008)

Member, TWAS Membership Advisory Committee (2007), Italy

Member, TWAS Young Affiliates Advisory Committee, Italy (2009)

Concil Member and Regional Vice President TWAS (2013-2016)

Board Member, International Basic Sciences Programme (IBSP) of UNESCO (2015-2018)

National

National Leprosy Control Board, Pakistan (February 1990)
Provincial Leprosy Control Board, Sind, Pakistan (1992)
Pakistan Medical Research Council: Convener, Steering Committee on Infectious Diseases (1994-1995).
Pakistan Medical Research Council, Pakistan (1995-1996)
Board of Governors, Marie Adelaide Leprosy Centre, Karachi (1997- to date)
Expert Committee on Biological Drugs, Government of Pakistan (member 2004-2008)
Member, Board of Governors of Centre of Excellence in Molecular Biology, University of Lahore (2005-2010).
Member, Evaluation of Multidisciplinary Science Journal, Higher Education Commission (2006)
Member, Working Group on Emerging Technologies, Science & Technologies, Higher Education Commission (2007)
Member, US-Pakistan Joint S & T Committee, Higher Education Commission (2007)
Elected Council Member, International Leprosy Association (March 2008-2010)
Member, HEC committee for Civil Awards (2008)
Member, Board of Trustees Pakistan Science Foundation (February 2009-2012)

The Aga Khan University

- Medical College Faculty Council, member
- Students Admissions Committee Panel, member, 1994
- Curriculum Review Group, member
- Research Committee, member
- Academic Pathway for Instructors (Chair)
- Search Committees for Chairs (Physiology), member
- Graduate Studies Committee,(1990-2001)
- Library Committee (Chair 1991)
- FHS Research Committee (Chair - 1997-2005)
- Graduate Program Committee, member, 1997
- Commissioning of CHS and Juma Research Building, member (1997-1998)
- Research Themes, member (1997)
- Annual National Symposium, AKU, 1999 (Chair)
- Molecular biology workshop AKU 1999 (Co-Chair)
- University Research Council - 2000
- Research Space Allocation – member, 1997
- Research Building Users committee, member, 1995-1999
- Basic Health Sciences working Group Committee, member, 1999
- Search Committee for Chair for Biological & Biomedical Sciences – member, 1999-2001
- Grant Review Committee – member , Jan 2000-2006

- 2000 National Symposium Organizing Committee, member, 2000
- Curriculum Renewal – member, 2001
- Task Force – Year 1 and Year 2 committee- member, March 2002
- PHD Committee – member - February 2002-2005
- Clinical Epidemiology Unit – member, March 2002
- FHS Research Committee – member, May 2002-2006
- Seed Money Grant and Research Development Support – Chair, May 2002-2005
- Subgroup of Health Sciences Centre Committee- November 2002-August 2003
- Search Committee for Dean – December 2002 – April 2003
- Search Committee for Pathology & Microbiology Chair, member – 2003
- Task force on Integrated Residency/Fellowship Clinical Effectiveness Program, member – Feb 2004
- Subcommittee for evaluating PhD core courses (Chair) June 2004
- Focus Group for PhD for Clinicians – July 2004
- Review of Core Curriculum for PhD student. (Chair) 2007
- Chair Masters in Clinical Research Review committee 2009
- FHS- PhD Programs Committee – April 2008-
- Chair- Admission Subcommittee of FHS PhD Programs May – June 2008
- MBBS students Interview panel (1990-date)
- PGME mini Interview panel (2011)

GRANTS FUNDED:

1. Isolation and purification of *Schistosomo mansoni* allergens. National Research Council. Washington, D.C. Fellowship grant (1973-1975).
2. Preparation and standardization of hyperimmune Serum to rye Grass Pollen Allergen Extracts. Funding Agency: National Institutes of Health Extramural Contracts Bethesda, MD \$ 20,000 (1977-1978).
3. Role of IgG subclasses in blocking IgE-mediated histamine release in filariasis and allergy, sponsored by The Rockefeller Foundation, National Institutes of Health, Bethesda, MD and The Aga Khan University. \$28000 (1986-1988 28 weeks),
4. Imported filariasis in Pakistan: Assessment of clinical disease and parameters associated with transmission. Collaborating Unit: Laboratory of Parasitic Disease, NIAID NIH, Bethesda M.D. Funding Agency, Fogarty International Centre, NIH, Bethesda, MD \$ 52,000 PL 480 funds (1987-1991) Project # 08025-N.
5. Molecular markers for prediction of reactions in leprosy. Collaborating Units: London School of Hygiene and Tropical Medicine (LSHTM) and Marie Adelaide Leprosy Centre (MALC). Funding agency, Rockefeller Foundation PI: Dr. Rabia Hussain(1987-1989)\$ 120,000.
6. Response to macrophages and polymorpho-nuclear cells to antigens and antibodies in leprosy. PI: Dr. Rumina Hasan, AKU \$ 7000 (1987-1988).
7. Prediction of the need to aspirate an amoebic liver abscess. PI: Dr. Mushtaq Ahmed. AKU. Rs. 42,000 (1987-1988).
8. Immunocompetency in the malnourished pediatric child. PI: Dr. Fouzia Qureshi AKU. Rs, 44, 180/- (1987-1988).
9. Immunological evaluation of purified recombinant and synthetic *M. leprae* antigens UNDP/World Bank/WHO/TDR. Institutional Strengthening Grant: Investigator Initiated Program Based Grant PI: Dr. Rabia Hussain Co PI: Dr. Rumina Hasan (AKU)and Dr. Hazel Dockrell (LSHTM)(1989-1993) \$ 250,426.
10. Early Leprosy in Family Contacts; International Development Research Centre: A pilot study: (1990) \$ 7000 CAD.
11. Immuno-regulation of tuberculosis UNDP/World Bank/WHO/TDR/ IMMTUB: Programme for vaccine development. PI: Dr. Rabia Hussain (1991-1993) \$60,000
12. Diagnosis and epidemiology of tuberculosis by DNA probes. Economic Commission of the European Communities. (Co PI: Dr. Jan van Embden, National Institute of Public Health and Environment Protection, Bilthoven, The Netherlands). (1991-1992). ECU 70000
13. The use of polymerase chain reaction in leprosy diagnosis and management (Co- PI: Dr. Neil Stoker, University of London).
14. DNA typing of *M. tuberculosis* epidemiology and evaluation of chemotherapy: European Economic Commission Period: (1992-1995). ECU 61,129.
15. T cell recognition of *M. leprae* antigens in leprosy contact patients. PI: Dr. Hazel Dockrell. Medical Research Council, (1992-1995) UK £ 7,1040.
16. Immunosuppressive Cytokines in tuberculosis UNDP/World Bank/WHO Programme for Vaccine Development PI: Dr. Rabia Hussain (1994-1996). \$ 58,000

17. Dissection of T and B cell responses to the *M. leprae* 10kDa antigen. UNDP/World Bank/WHO Programme for Vaccine Development PI: Dr. Rabia Hussain Co PI: Dr. Thomas Chiang and Dr. Hazel Dockrell (LSHTM) (1994-1996) \$ 73,000.
18. Development of new peptide-based skin test reagents for Leprosy: UNDP/World Bank/WHO. Program for Vaccine Development IMMYC Steering Committee Initiative PI: Dr. Rabia Hussain & Dr. Hazel Dockrell (1996-1998). \$ 35,000.
19. Monocyte activating *M. tuberculosis* proteins in TB pathogenesis: Serological evaluation of the *M. tuberculosis* proteins 58kDa antigen in patients with tuberculosis. Functional assessment of IgG anti-58kDa subclasses antibodies in cytokine production. National Institutes of Health RO1#A1-35240; PI: Dr. Rabia Hussain Supplemental grant for sabbatical in 1996 at Case Western Reserve University, Cleveland, Ohio, U.S.A. \$ 15000
20. Macrophage signaling and cytokine expression in leprosy patients with lepromatous disease. PI Dr Zahra Hasan Co PI: Dr. Rabia Hussain & Dr. Bukthiar Shah . Re-Entry Grant, Special Programme for Research and Training in Tropical Diseases (TDR), WHO, Switzerland. funded \$ 40,000 (1999-2001)
21. Cytokine responses in patients with pulmonary, extra-pulmonary and lymphadenopathic tuberculosis-profiles of disease severity. PI Dr. Zahra Hasan Co PI: Dr. Rabia Hussain Funded by AKU Seed Money Grant (1999-2001) \$ 10,000
22. Does IL10 play a role in the up regulation of IgG1 antibodies responses in leprosy? Wellcome Trust, UK. £ 14694 (funding period: January 1999-2002). Travel grant to Drs Dockrell and Hussain for exchange visits to develop a proposal for the above listed project.
23. Regulation and modulation of IgG1 subclass by cytokines in leprosy. PI: Dr. Rabia Hussain Co:PI Dr. Hazel Dockrell, Dr. Arnawaz Kifayet, Dr. Sarwat Jamil AKU, University Research Council, (2000-2002) \$24350
24. Development of a simple bedside applicable tool for diagnosis of severe malaria PI: Irfan-ul-Hasan Zaidi, Co-PI: Dr. Asim Beg & Dr. Rabia Hussain. \$ 8500 (2003-2004) Seed Money Grant and Research Developmental Support.
25. *Mycobacterium tuberculosis*-induced apoptosis in human macrophages: manipulation of a host cell defense mechanism PI: Mr. Ali Tayyebi Co-PI: Dr. Rabia Hussain & Dr. Zahra Hasan \$ 10,000 (2003-2004) Seed Money Grant and Research Developmental Support.
26. Laboratory Markers of Risk for Clinical Disease in Household Contacts of Tuberculosis Patient with active disease” Ministry of Science and Technology. Government of Pakistan PI: Dr. Rabia Hussain. Rs. 3.39 million (Aug 2004-July 2006).
27. Characterization of *M. tuberculosis* Beijing strains in Pakistan using molecular and immunological techniques. PI: Dr. Rumina Hasan Co-PI: Dr. Rabia Hussain & Dr. Zahra Hasan funded by AKU University Research Council (2003-2006) \$ 36,250.
28. *Mycobacterium tuberculosis* - induced host cellular activation: effect on cytokine expression and signaling PI: Abdul Kareem Khan. AKU University Research Council, (2003-2006) \$ 24,700.
29. Association of genetic diversity with virulence and antimicrobial resistance in M.TB isolates at AKUH. PI: Ashoo Ali Supervisor Dr. Rumina Hasan Co-Supervisor: Dr. Rabia Hussain & Dr. Zahra Hasan. Funded by AKU University Research Council, (2004-2006) \$ 39500
30. Chemokines as immunopathological markers in tuberculosis infections – pulmonary and extra-pulmonary PI: Dr. Zahra Hasan, Co-PI Dr. Rabia Hussain and Dr. Rumina Hasan. Applied

- Pathogenesis and Genomics Committee, Special Program for Research in Tropical Diseases, WHO. World Health Organization. (June 2004-August 2007) \$ 70,000
31. Towards unraveling the molecular and genetic architectures of sepsis in a Pakistani population
PI: Dr. Shehla Siddiqui, Co-PI: Dr. Bushra Jamil, Dr. Fouzia Khan, Dr. Phillippe Frossard and **Dr. Rabia Hussain**. University Research Council (2005-2007) \$ 26500.
 32. Initiative for Diagnosis and Epidemiological Assays for Leprosy (IDEAL) Funded by Heiser Foundation. (1/6 partners R. Hussain PI AKU, Dr. Hazel Dockrell, PI, LSHTM) \$ 600,000.) LSHTM/AKU share for year 1 \$42,000 (Starting 2006)
 33. IFN γ mediated regulation of host innate immunity to tuberculosis: molecular mechanisms of chemokine activation in tuberculosis infections. \$ 7,000 Dr. Zahra Hasan (PI) Dr. Rabia Hussain (Unit Leader) funded by TWAS Grants for equipment (August 2006)
 34. Prevalence of *Mycobacterium tuberculosis* strain types in Karachi and their association with drug resistance. Dr. Rumina Hasan (PI) Dr. Zahra Hasan (Co-PI) **Dr. Rabia Hussain (Collaborator)** £ 40,000/- Funded by Bennenden Society, London. (2006-2008)
 35. Antimicrobial resistance in Pakistan; A program to develop and strengthen capacity for surveillance, containment and diagnosis through public-private sector partnership” \$575,000 Rumina Hasan (PI) Dr. Rabia Hussain (Co-Investigator) funded by HEC - US and Pakistan Science Technology Cooperative Program, Pakistan (2006-2009)
 36. Hussain R. Travel Grant to attend the 3rd International Immunology Al-Ain Meeting, UAE. March 17-29, 2008, HEC Travel Grant. (Rs. 71,400)
 37. Relationship of IgG subclasses, pro-inflammatory cytokines IFN γ , TNF α and IL6 and down regulatory cytokines and IL10 with disease progression and severity in tuberculosis in BCG vaccinated and highly endemic TB transmission area. Funded by HEC International Research Support Initiative Program (IRSIP) Najeeha Talat PhD student, Dr. Rabia Hussain (supervisor) Dec 2008
 38. *H. pylori* infection and the outcome of household TB exposure (2009-2010) (Investigators: Julie Parsonnet, Sharon Perry Stanford University, Rabia Hussain and NajeehaTalat . The Aga Khan University(Bill and Melinda Gates Foundation (US \$ 100000).
 39. Identification of biomarkers indicating risk of disease development in exposed household contacts of tuberculosis patients. Dr. Rabia Hussain (PI) Dr Tashmeem Razzaki (Co-PI) Funded by HEC (2007-10/ex 12/2011) Rs1403549
 40. Frequency and Association of IFN γ Single Nucleotide Polymorphisms (SNP's) in tuberculosis. Funded by AKU University Research Council PhD student research award to Ambreen Ansari Funds US\$8695 (2009-2010) (Supervisor: Dr Rabia Hussain)
 41. Do Single Nucleotide Polymorphisms (SNPs) in the CC-Chemokine (CCL2 and CCL1) determine the severity and /or susceptibility of tuberculosis in Pakistan?” (04-2010-07-2012) Pakistan Academy of Sciences. (Funded Rs 1.8 million).
 42. Effect of 1,25-dihydroxyvitamin D3 on antimicrobial peptides and cytokine secretion in tuberculosis patients. (Investigators: PI NajeehaTalat; Co_PI Rabia Hussain, Bushra Jamil, Romaina Iqbal; The Aga Khan University, Sharon Perry Stanford University AKU, University Research Council Funds Approved Rs 1657282) (2011-2012)
 43. Nonspecific immune surveillance of mycobacterium BCG on innate and adaptive immunity. (PI Dr Najeeha Talat,Co PI R Hussain); AKU seed money grant (1,494,589 PKR)

44. In vitro drug sensitivities and single nucleotide polymorphism in determining antimalarial resistance in Plasmodium falciparum isolates. PI Dr Najia Ganji PSF requested Rs 19,63,296 (2012-2013)
45. Clinical and experimental studies on the role of “Suppressor of Cytokine Signaling” proteins in Tuberculosis PI Dr Zahra Hasan requested \$15000 (2012-2013).

SCIENTIFIC SESSION CHAIRED/CO-CHAIRER:

1. American Society of Tropical Medicine and Hygiene, Filariasis session, *Am. Soc. Trop. Med. Hyg.* 1993 (Published) Chair: Filariasis session, American Society of Tropical Medicine and Hygiene, *Am. Soc. Trop. Med. Soc.* 1984 (Published)
2. Chair : Immunodiagnostic Approaches Session: First Vaccilep workshop on the Immunology of Leprosy (March 29-31, 1989) Proceedings published in International Journal of Leprosy.
3. Co-Chair of the session on Immunology and Infections at 5th Joint Congress of the Sexually Transmitted Diseases and Infectious Societies of Southern Africa, 20-24 May 1995.
4. Co-Chair of the session on Infectious diseases (Mycobacteria) at the Second National Symposium on “Basic and applied research in Health care and social development” September 23-24, 1995.
5. Co-Chair Session III on Autoimmunity – Immunological Diseases - Second Al Ain International Immunology Meeting (March 11-14, 2002) Al-Ain, UAE
6. Chair: 8th International Symposium on “Protein Structure Function Relationship, HEJ International Chemistry Center, Karachi, Pakistan (Jan 2005)
7. Chair: 4th annual Conference on Infectious Diseases Can Immune markers define disease severity /dissemination in pulmonary and extrapulmonary tuberculosis? . Liaquat National Hospital, Karachi Pakistan (17-19 March 2006).
8. Chaired, Session 17th International Leprosy Congress, January 30-February 3, 2008, Hyderabad, India.
9. Appointed Judge for poster Session at the 17th International Leprosy Congress, January 30-February 3, 2008, Hyderabad, India.
10. 21st General Meeting of TWAS Hyderabad, India, (19-22 October 2010)
11. IUATLD (November 11-15 2010), Session 2, Symposium: Tuberculosis)
12. 3rd International Symposium-cum Training Course on Molecular Medicine and Drug Research (MMDR-3; Jan 03-06, 2011) International Center for Molecular Medicine and Drug Research Karachi University, Karachi Pakistan
13. Chaired session 1; Symposium :Tuberculosis –Epidemiology ,Diagnosotics and Therapeutics (November 03, 2011), Institute of Biochemistry and Biotechnology, University of Punjab, Lahore-Pakistan
14. Chaired Immunology session: Pakistan Association of Pathologist, Marriot Hotel Karachi Pakistan (December 17th-18, 2011)
15. Chaired Scientific Session “ Workshop on Allergies” organized by Pakistan Society of Immunology, April 14, 2014, Venue Sind Institute of Urology and Transplantation

PUBLICATIONS (* Corresponding Author)

1. **Hussain, R. ***, Strejan, G.H and Campbell, D.H.(1972). Hypersensitivity to *Ascaris suum* allergens. VII. Isolation and partial characterization of an Allergen. J. Immunol. **109**(3): 638-647. (IF: **6.068**)
2. **Hussain, R., *** Bradbury, S.M. and Strejan, G.H.(1973): Hypersensitivity to *Ascaris* Antigens. VIII. Characterization of a Highly Purified Allergen. J. Immunol. **111**(1): 260-268. (IF: **6.068**)
3. **Hussain, R. ***, Vannier, W.E. and Murrell, D.K.(1975). Hypersensitivity to *Schistosoma mansoni* antigens. Immunochemical and biological characterization of an antigenic extract from *S. mansoni* antigens. Immunochemistry **12**: 561-567. (IF: **0.614**)
4. Vannier, W.E., **Hussain, R.,** and Murrell, K.D. (1975): *Schistosome allergens* Proc. Int. Conf.Schisto. **2**: 587-596
5. Marsh, D.G., Hsu, S.H., **Hussain, R.,** Meyers, D.A. Friedhoff, L.R., and Bias, W.G. (1980). Genetics of human immune response to allergens J. Aller. Clin. Immunol. **65**: 322-332. (IF: **8.115**)
6. Marsh, D.G., Belin, L., Bruce, C.A., Lichtenstein, L.M., and **Hussain, R. *** (1981). Rapidly released allergens from short ragweed pollen I. Kinetics of release of known allergens in relation to biological activity. J. Aller. Clin. Immunol. **67**: 206-216. (IF: **8.115**)
7. **Hussain, R. ***, Norman, P.S. and Marsh, D.G. (1981). Rapidly released allergens from short ragweed pollen. II. Identification and partial purification. J. Aller. Clin. Immunol. **67**: 217-222. (IF: **8.115**)
8. Lowenstein, H., King, T.P., Goodfried, L., **Hussain, R.,** Roebber, M., and Marsh, D.G. (1981). Antigens of *Ambrosia elatior* (Short Ragweed) Pollen II. Immunochemical Identification of Known Antigens by Quantitative Immunoelectrophoresis. J. Immunol **127**: 637-642. (IF: **6.068**)
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105. **Hussain, R***. Shahid, F., Zafar, Z., and Dockrell H.M. (2005) Immune dissection of *Mycobacterium leprae* heat shock protein 10K(Groes) using synthetic overlapping peptides. Proceedings of 8th International symposium "Protein structure functional relationship, International Institutes for Chemical Sciences, University of Karachi, Pakistan. Eds.A Abbasi and S A Ali. pp 35-46 (N)
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108. Hasan, Z., Zaidi, I., Zafar, S., Khan, A.A. and **Hussain R** (2006) Elevated serum CCL2 concomitant with a reduced *Mycobacterium*-induced response leads to disease dissemination in leprosy. Scandinavian Journal of Immunology. **63**: 241-247 (IF 1.928)
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111. **Hussain, R***., Talat, N., Shahid, F., Dawood G. (2007) Longitudinal tracking of cytokine patterns after acute exposure in household contacts. Distinct patterns of IFN γ / IL10 ratios are associated with protection and disease development. Clinical and Vaccine Immunology. **14** (12): 1578-1586 (IF 1.995)
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113. Hasan, Z., Jamil, B., Khan, J.,Ali, R., Khan, M.A., Yusuf, M.S., Jamil, S., Irfan, M. & **Hussain, R.** (2009) Relationship between circulating levels of IFN γ , IL10, CXCL9 & CCL2 in Pulmonary and Extrapulmonary Tuberculosis is dependent on disease severity. Scandinavian Journal of Immunology **69**:259-67(IF 1.928)
114. Geluk, N., Spencer, J.S., Bobosha, K., Pessolani, M.C.V., Pereira, G.M.B., Banu, S., Honore, N., Reece, S., MacDonald, M., Sapkota, B.R., Ranjit, C., Franken, K.L.M.C., Zewdie, M., Aseffa, A., **Hussain, R.**, Stefani, M.M., Cho, S-G., Oskam, L., Brennan, P.J. and Dockrell, H.M. (2009). From Genome-based in silico predictions to Ex-Vivo Verification of Leprosy Diagnosis. Clinical and Vaccine Immunology doi: 10.1128/CVI.00414-08. (IF 1.995)

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117. Talat, N, Shahid, F., Dawood G and **Hussain, R***. (2009) Dynamic changes in biomarker profiles associated with clinical and subclinical tuberculosis in a high transmission setting: A four year follow up study. Scandinavian Journal of Immunology 69:537-546 (**IF 1.928**)
118. Hasan, Z, Jamil, B, Ashraf,M, Islam, M, Yusuf, M S, Khan J A, and **Hussain, R**. (2009) ESAT6- and CFP10- induced IFN γ and CXCL9 can Differentiate Severity of Tuberculosis. PloSOne 4 (4) e 5158. doi. 10.1371(**IF 4.41**)
119. Ghanchi,NK., Beg A M. and **Hussain R*** (2009). Estimation of parasite load using rapid diagnostic test ICT now in *Plasmodium falciparum* malaria. Scandinavian Journal of Infectious Diseases. 2009; 41 (8):597-601. (**IF 1.928**)
120. Hasan, Z, Jamil, B, Ashraf,M, Islam, M, Yusuf, M S, Khan J A, and **Hussain, R**. (2009) Differential live M. tuberculosis –, BCG-, and recombinant ESAT6- and CFP10- induced immunity in tuberculosis Clinical and Vaccine Immunology CVI doi: 10.1128/cvi.00091-09 accepts) (**IF 1.995**)
121. **Hussain R*** Talat, N Shahid, F and Dawood G (2009) Biomarker changes associated with Tuberculin Skin Test conversion in a recently exposed household cohort. A two-year longitudinal follow up (PloSOne 4, e7444).(**IF 4.41**)
122. Hasan Z, Cliff J , Dockrell H, Kl¹, MA, MI, Jamil B and **Hussain R (2009)** CCL2 responses to Mycobacterium tuberculosis are associated with disease severity in tuberculosis PloSOne 4 e8459 (**IF 4.41**)
123. Najia K.Ghanchi, NK., Mårtensson A, Ursing J., Jafri, S., Bereczky S, **Hussain, R.**, M. Beg A. (**2010**) Genetic diversity among Plasmodium falciparum field isolates in Pakistan measured with PCR genotyping of the merozoite surface protein 1 and 2. Malaria Journal 9:1 1 (doi:10.1186/1475-2875-9-1)
124. Sharon Perry, Bouke C. de Jong, Jay Solnick, Maria de la Luz Sanchez, Shufang Yang, Philana Ling Lin, Lori M. Hansen, Najeeha Talat, Philip C. Hill, **Rabia Hussain**, Richard A. Adegbola, JoAnne Flynn, Don Canfield, & Julie Parsonnet (**2010**). *Helicobacter pylori* is associated with protection against tuberculosis (PloSOne 5 (1) e8804: doi:10.1371/journal.pone.0008804). (**IF 4.41**)
125. Talat N., Perry S, Parsonnet, J., Dawood G., **Hussain, R***. (**2010**). Is there an association of vitamin D deficiency with tuberculosis disease progression in a high endemic setting? (EID doi:10.3201/eid1605.091693 **16** :(5) **853-855** (**IF 5.8**)

126. Talat, N, Shahid F, Perry S, Dawood G and **Hussain R*** (2011). Th1/Th2 Cytometric Bead Array can discriminate cytokine secretion from endogenously activated cells in pulmonary disease, recent and remote infection in tuberculosis. *Cytokine* 54 (2011), pp. 136-143 DOI: 10.1016/j.cyto.2011.01.012 [IF 3.123]
127. Sharon Perry, **Rabia Hussain** and Julie Parsonett (2011). Impact of Mucosal Infections on Acquisition and Progression of *M. tuberculosis*. (*Mucosal Immunology* doi: 10.1038/mi.2011.11) IF 3.627 (invited review)
128. **Hussain, R*** Talat, N, Ansari, A, Shahid, F, Hasan Z and G Dawood (2011) Endogenously activated Interleukin-4 differentiates disease progressor's and non-progressor in tuberculosis susceptible families. A two-year biomarkers follow up study. (*J Clin Immunol.* 2011 Oct; 31 (5):913-23. DOI 10.1007/s10875-011-9566-y) IF 3.248
129. **Hussain R***, Ansari A, Talat N, Hasan Z, Dawood G (2011) CCL2/MCP-I Genotype-Phenotype Relationship in Latent Tuberculosis Infection. *PLoS ONE* 6(10): e25803. doi:10.1371/journal.pone.0025803 (IF 4.41)
130. **Hussain R*** (2011) Gene Association studies in tuberculosis: A question of case-control definitions? *OMICS Mycobacterial Diseases (Invited Editorial) Mycobact Diseases* 2011, 1:1 <http://dx.doi.org/10.4172/2161-1068.1000e104>
131. Ansari A, Hasan Z, Dawood G, **Hussain R*** (2011) Differential Combination of Cytokine and Interferon- c +874 T/A Polymorphisms Determines Disease Severity in Pulmonary Tuberculosis. *PLoS ONE* 6(11): e27848. doi:10.1371/journal.pone.0027848(IF 4.41)
132. **Hussain R*** (2012) Field applicable biomarker assays. Which sample is reflective of active tuberculosis? (*Invited Editorial) Mycobacterial Diseases* 2012, 2:2 <http://dx.doi.org/10.4172/2161-1068.1000e109>
133. Kiran Iqbal Masood, Martin E. Rottenberg, Berit Carow, Nisar Rao, Mussarat Ashraf, **Rabia Hussain**, Zahra Hasan (2012) SOCS1 Gene Expression is Increased in Severe Pulmonary Tuberculosis *Scandinavian Journal of Immunology*, 2012, 76, 398–404
134. Z Hasan, N Rao, N Salahuddin, M Islam, M Ashraf, ME Rottenberg, and **R Hussain** Mycobacterium tuberculosis Sonicate-Induced IFN γ , CXCL10 and IL10 can Differentiate Severity in Tuberculosis *Scandinavian journal of immunology* 75 (2), 220-226
135. Siddiqui S, Jamil B, Nasir N, Talat N, Khan A F, Frossard P, Hussain R. Characteristics and outcome of Sepsis- A perspective from tertiary care hospital in Pakistan. *IJSER* 2013; 4(9):1013-1023.
136. Kiran I Masood, Martin E Rottenberg, Naseem Salahuddin, Muhammad Irfan¹, Nisar Rao, Berit Carow, Muniba Islam, **Rabia Hussain** and Zahra Hasan (2013) Expression of *M. tuberculosis*-induced suppressor of cytokine signaling (SOCS) 1, SOCS3, FoxP3 and secretion of IL-6 associates

with differing clinical severity of tuberculosis *BMC Infectious Diseases* 2013, 13:13 doi:10.1186/1471-2334-13-13

137. KI Masood, **R Hussain**, N Rao, ME Rottenberg, N Salahuddin, M Irfan, and Z. Hassan
Differential Early Secreted Antigen Target (ESAT) 6 kDa–induced IFN- γ and SOCS1 expression
distinguishes latent and active tuberculosis *The Journal of Infection in Developing Countries* 8
(01), 059-066, 2014
138. Iqbal N T, Hussain R. Non-specific immunity of BCG vaccine: A perspective of BCG
immunotherapy. *Trials Vaccinol*; 2014, 3:143–149
139. Iqbal, N. T.; Fatima, S. S.; Rabia Hussain; Rao, N. A.; Narius Virji; Bushra Jamil; Muhammad
Irfan. 2014. Interplay of chemo attractant peptides (Cathelicidin and Chemerin) with vitamin-D
in patients with pulmonary tuberculosis. *British Journal of Medicine and Medical Research* 2015
Vol. 7 No. 7 pp. 611-622 ISSN 2231-0614 (<http://www.sciencedomain.org>)
140. Rabia Hussain (2015). Prof. Salam’s legacy: TWAS - the voice for science . *Technology Times*
(Weekly, Islamabad) Pages: 6 Vol: VI No: 05 (February 02 – 08, 2015)
141. Rabia Hussain* Ali Murtaza and Mutaher Zia (2015). Leprosy Control in Pakistan: Fifty
five years of commitment and dedication. *Science Vision* (Comsats, Islamabad). Invited
review (in press).

Invited key note speaker

1. **Hussain, R.**, Kaushal, N.A. and Ottesen, E.A: Quantitation of total and parasite specific IgE in Bancroftian filariasis. First Symposium on Immunoparasitology, Lincoln, Nebraska, (June 17-19, 1981). **[Invited Speaker]**
2. **Hussain, R.** Immunoglobulin E responses in human filariasis: Quantitative and qualitative aspects. Working paper for the WHO/TDR Scientific Working Group on "Lymphatic Filariasis-Diagnosis of Infection and Evaluation of Control". Columbo, Sri Lanka. (October 12-16, 1981). **[Invited Speaker]**
3. **Hussain, R.**, Goldstone, A., Hofstetter N., Poindexter, R.W. and Ottesen, E.A.: Development of a solid phase radio-immunoyassay for quantitation of IgE in schistosomiasis: Correlation with skin tests and histamine release. Helminthological Society of Greater Washington, D.C. USA (January 1982). **[Invited Speaker]**
4. **Hussain, R:** Regulation of IgE responses in parasitic diseases Gordon Research Conference, Rochester, USA (August 1983). **[Invited Speaker]**
5. **Hussain, R.**, and Ottesen, E.A: Parallel recognition of filarial antigen by IgE and IgG4 antibodies. International Symposium on Clinical Immunology. Sponsored by: Division of Rheumatology, Allergy and Clinical Immunology, Department of Internal Medicine and the Office of Continuing Medical Education, School of Medicine, University of California, Davis. (June 6-7, 1986). **[Invited Speaker]**
6. **Hussain, R.** Quantitative Elisa antibody assays in leprosy patients contacts. First Vaccilep workshop on the Immunology of Leprosy, Kathmandu, Nepal (March 29-31, 1989) **[Invited Speaker]**
7. **Hussain, R**, Jamil, S., Kifayet, A. and Hasan, R. Quantitation of IgM antibodies to the M. leprae synthetic dissachharide can predict early bacterial multiplication in leprosy, 2nd Faculty Student Seminar, The Aga Khan University, Karachi, Pakistan (November 8, 1989) **[Invited Speaker]**
8. **Hussain , R.**, Sturm, A.W. Minai, A. Dawood, G. and Ellner, J. Clinical and Immunological spectrum of tuberculosis in an endemic area in Karachi, Pakistan. XIII International Congress of tropical Medicine and Malaria, Joteim, Pattaya, Thailand. (November 29-Dec 4, 1992) **[Invited Speaker]**
9. **Hussain, R.** Human antibody responses to the 18KDa protein of *M.leprae* in lepromatous leprosy. Immunology workshop programme, 14th International Leprosy Congress Orlando, Florida, USA (August 29, 1993 to September 4, 1993). **[Invited Speaker]**

10. **Hussain, R.** "Major Advances in the Immunology of tuberculosis" 5th Joint Congress of the Sexually Transmitted Diseases and Infectious Diseases Societies of Southern Africa, (May 20-24 1995). **[Invited Speaker]**
11. **Hussain, R.,** Hasan, R., Dawood, G., and Ellner, J.J. Major Advances in immunology tuberculosis. Proc. 2nd Nat.Symp. on Hlt care & Soc. Dev. AKU. Karachi. 1-9. (September 23-24, 1995) **[Invited Speaker]**
12. **Hussain, R.** and Pfau, R. Leprosy in Pakistan: Epidemiology and Immunology of reactional complications. Golden Jubilee, Dow Medical College & Century Celebration, Civil Hospital, Karachi, Pakistan (December 28 - January 1, 1997). **[Invited Speaker]**
13. **Hussain, R.** Value of BCG vaccination and interpretation of PPD test in TB endemic areas. A focus on awareness and management of Tuberculosis and Leprosy for General Practitioners and Health Care Workers" A Continuing Medical Programme The Aga Khan University Hospital, Karachi, Pakistan (July 15-17, 1997) **[Invited Speaker]**
14. **Hussain R.** Invited Plenary lecture on Tuberculosis : Current Issues. Symposium on Update on infection: Current strategies in diagnosis and management, Sind Institute of Urology and transplantation, Karachi, Pakistan (August 14-15, 1999). **[Invited Speaker]**
15. **Hussain, R.,** Dockrell, H., and Chiang TJ. Leprosy patients with lepromatous disease recognize cross reactive T cell epitopes in the *M. leprae* 10 kDa antigen. 10th International Congress of Immunology, New Delhi, India (November 1-6, 1998). **[Invited Speaker]**
16. **Hussain, R.** "Immunological studies of Leprosy in Pakistan" 5th International Conference on Emerging Infectious Diseases in the Pacific Rim Chennai, India. (Jan 7-9, 2000.) **[Invited Speaker]**
17. **Hussain, R.** "Mapping of T & B cells epitopes in leprosy. Department of Biotechnology, All India Institute of Medical Sciences, India.(February 1, 2000). **[Invited Speaker]**
18. **Hussain, R.** "Antibody influence on cytokine expression in human tuberculosis" Department of Biotechnology, All India Institute of Medical Sciences, India. (February 2, 2000.) **[Invited Speaker]**
19. **Hussain, R.** "Diagnostic issues of tuberculosis in the developing world" 23rd Joint Co-ordinating Board (JCB) meeting, World Health Organization, Geneva, Switzerland (June 27,2000) **[Invited Speaker]**
20. **Hussain, R.** "IgG Subclasses as diagnostic markers in mycobacterial diseases". AKU CME Seminar on Diagnostic Dilemmas in Tuberculosis.(September 27, 2000). **[Invited Speaker]**

21. **Hussain, R.** Assessment of correlates of protection in tuberculosis by whole blood assay. Can this be used for evaluation of vaccine efficacy? One day National Symposium Tuberculosis – Current status Armed Forces Institute of Pakistan, Rawalpindi, Pakistan (April 28, 2001).
[Invited Speaker]
22. **Hussain, R.** Shiratsuchi, H., Hasan, R., Hasan, Z., Thakurdas, S.M., Ellner, J.J. and Wallis, R.. Opsonizing antibodies to Mycobacterial antigens in TB patients up-regulate monocyte cytokines TNF- α and IL-6 but not IL-10. Second Al-Ain Immunology Meeting, Al-Ain, UAE. (March 11-14, 2002). **[Invited Speaker]**
23. **Hussain, R. :** Role of IgG subclasses in parasitic and mycobacterial infections with respect to pathogenesis and protection. TWAS 8th International Conference, New Delhi, India (Oct 23-31, 2002). **[Invited Speaker]**
24. **Hussain, R. :** Fundamental aspects of immune pathogenesis in infectious diseases. Role of IgG subclasses in parasitic and mycobacterial infections with respect to pathogenesis and protection. 1st International Congress on Infectious Diseases, Liaquat General Hospital, Karachi Pakistan (March 28-30, 2003) **[Invited Speaker]**
25. **Hussain, R.** Immunological Principles of vaccine development (Workshop on vaccine production (AKU August 8, 2003). Karachi, Pakistan **[Invited Speaker]**
26. **Hussain, R.** The scientific foundations for vaccine related R and D: How do we measure? (Vaccine development, Production and Utilization in Developing World, Issues, Prospects and Implications for Pakistan development (Workshop on Vaccine Production (AKU August 09, 2003)) **[Invited Speaker]**
27. **Hussain, R.,** Zafar, S., and Dockrell, H. . Immune dissection of Mycobacterium leprae heat shock protein 10K(Groes) using synthetic overlapping peptides. 8th International symposium “ Protein structure functional relationship, HEJ International Center for Chemistry, Karachi University (7-10 January, 2005) **[Invited Speaker]**
28. **Hussain R.** Immune Dissection of *Mycobacterium Leprae* Heat Shock Protein 10k(Groes) Using Synthetic overlapping peptides The Aga Khan University, Health Sciences Research Assembly, Karachi (March 15-17, 2005). **[Invited Speaker]**
29. **Hussain, R.** Identification of molecular markers for disease diagnosis, pathogenesis and vaccine development. AKU Multi disciplinary Research Seminar on Tuberculosis (August 26, 2005).
30. **Hussain, R.** Mirza, N. and Jamil, B. Can immune markers define disease severity/dissemination in pulmonary and extra-pulmonary tuberculosis? 4th Annual Conference on Infectious Diseases, Infectious Diseases Society of Pakistan. Liaquat National Hospital. Karachi. (March 17-19, 2006) **[Invited speaker]**

31. **Hussain, R.**, Shahid, F., Talat, N., Ansari, A., Hasan, Z., Razzaki, T. & Dawood, G. Laboratory Markers of Risk for Clinical Disease in Household Contacts of Tuberculosis Patients with active disease. National Symposium on “Biotechnology for Economic Prosperity” July 24-26, 2006, Nathiagali, Pakistan. **[Invited speaker]**

32. **Hussain R.** “Challenges for developing a bench-based research program in Pakistan” AKU Health Sciences Research Assembly, April 25, 2007 The Aga Khan University, Karachi. **[Invited speaker]**

33. **Hussain, R.**, Talat, N., Shahid, F., Nasir, A., Dojki, M., and Dawood, G (2008). Association of IFN γ /IL-10 with disease development after acute exposure to *Mycobacterium tuberculosis* in house hold contacts. 3rd Al-Ain International Immunology Meeting (March 17-20) Al-Ain, UAE. **[Invited speaker]**

34. **Hussain R** (2008). Immunological basis of Immunization (Course on vaccinology in Developing Countries: Sponsored by NIH Fogarty International Center, USA) (Nov 08, The Aga Khan University, Karachi, Pakistan.) **[Invited speaker]**

35. **Hussain R** (2008). Correlates of protection in tuberculosis in a high transmission pocket in Pakistan. International Symposium of Royal Society of Tropical Medicine and Hygiene (Nov 10-13, 2008), The Aga Khan University, Karachi, Pakistan.) **[Invited speaker]**

36. **Hussain, R.**, Talat, N., Shahid, F., Nasir, A., Dojki, M., and Dawood, G (2008). Biomarker profiles for new TB vaccine evaluation. 2nd National Conference on Health Biotechnology (27-28 May) **[Invited speaker]**

37. **Hussain R.** (2009) The Karachi Cohort. TB Latent infection profile. University of California at UC Davis, USA. (January 05), **[Invited Speaker]**

38. **Hussain R.** (2009) Immunologic Correlates of latent Tuberculosis infection (January 13) Stanford University, California USA. **[Invited Speaker]**

39. **Hussain R.** (2009) Role of translational research in PGME: benefits for clinical practice. XIV annual PGME Conference on “Research: Going Beyond Clinical Competence (April 24) AKU-FHS, Karachi, Pakistan) **[Invited Speaker]**

40. **Hussain R.** (2009) Overcoming barriers for research in clinical practice: Is it possible? Research Retreat, Dept. of Anaesthesia, The Aga Khan University, Karachi, Pakistan. (April 18, 2009) **[Invited Speaker]**

41. **Rabia Hussain** “Cytometric Bead Array (CBA) and its utility in Pathology and Microbiology Research” Faculty Forum 12 June 2010, Department of Pathology and Microbiology [**Invited Speaker**]
42. **Rabia Hussain**: Biomarkers of progressive tuberculosis in a high burden TB endemic area with low HIV prevalence International Union against Lung and Tuberculosis (IUATLD, Berlin, Germany, November 11-15, 2010) [**Invited Speaker**]
43. **Rabia Hussain**, Najeeha Talat, Ambreen Ansari Firdaus Shahid Zahra Hasan and Ghaffar Dawood. Phenotypic and genotypic biomarkers of disease infection and progression in tuberculosis MMDR-3, ICGBS, Karachi University, Jan 04, **2011** [**Invited lecture**]
44. **Rabia Hussain**, Najeeha Talat, Ambreen Ansari Firdaus Shahid Zahra Hasan and Ghaffar Dawood. Phenotypic and genotypic biomarkers of disease infection and progression in tuberculosis MMDR-3, ICGBS, Karachi University, Jan 04, **2011** [**Invited lecture**]
45. **Rabia Hussain (2011)** Immunological markers of disease progression in tuberculosis: A longitudinal Cohort Study. Juma Research Group June 15, **2011** [**Invited lecture**]
46. Rabia Hussain (2011) Immune biomarkers of discriminating recent infection, disease progression and active disease in tuberculosis. National Symposium on “Tuberculosis- Diagnostics and Therapeutics” School of Biological Sciences, University of the Punjab, Lahore. Thursday, 3rd November 2011 (Invited Lecture)
47. Rabia Hussain (2012). Immune biomarkers of tuberculosis disease susceptibility and severity. Pakistan Association of Pathology, Islamabad (Dec 2012)

ORAL/POSTER PRESENTATION

1. **Hussain, R.** and Strejan, G.H: Isolation and characterisation of an *Ascaris suum* allergen. Proc. Can. Fed. Biol. Sci. **14**: 36, 1972. [**Oral**]
2. **Hussain, R.**, Strejan, G.H. and Campbell, D.H.: A dialyzable *Ascaris suum* fraction with allergenic activity. Fed. Proc. **31**: 751, 1972. . [**Oral**]
3. Vannier, W.E. and Murrell, K.D.: Hypersensitivity to *Schistosoma mansoni* allergens. Fed. Proc. **34**: 983, 1975. [**Oral**]

4. **Hussain, R.** The role of reagins in antibody mediated protective response to *Schistosoma mansoni* infection. U.S.-Japan Conference on Parasitic Diseases. Bethesda MD, USA. October 1975. . **[Oral]**
5. **Hussain, R.**, Marsh, D.G. and Balner, H: RhLA and immune response to highly purified allergens in monkey families. J. Supramol. Struct. p. 182, 6th Annual ICN-UCLA SYMPOSIA, Molec. Cell. Biol., March 1977. . **[Oral]**
6. **Hussain, R.**, Marsh, D.G. and Norman, P.S.: Rapidly released ragweed allergens. American Congress of Allergy and Immunology , New York, March, 1977 (abstract # 44). . **[Oral]**
7. **Hussain, R.**, Marsh, D.G. and Balner, H.: RhLA and immune response to highly purified antigens in monkey families. Fed. Proc. **37**. 1475, 1978. . **[Oral]**
8. Marsh, D.G., Bias, W.B., Meyer, D.A., Freidhoff, L.R., **Hussain, R.**, and Chase, G.A: Epidemiology and genetics of human allergic response. Asthma and Allergic Disease Centres Workshop, Nov. 30 - Dec. 1, 1978. **[Oral]**.
9. Hussain R., Maryland Academy of Sciences. Invited Speaker to ninth and tenth graders. Two top students from all Baltimore Schools. "Importance of vaccines for Health purposes" (1978). . **[Oral]**
10. **Hussain, R.**, and Marsh, D.G.: Allergenic activity of a rapidly released basic component of short ragweed, Ra6. American Academy of Allergy, March 1979. . **[Oral]**
11. Friedhoff, L.R., Chase, G.A., Meyers, D.A., **Hussain, R.**, Hsu, S. and Marsh, D.G.: A genetic epidemiology study of immune responsiveness. American Academy of Allergy March 1979. . **[Oral]**
12. **Hussain, R.**, and Marsh, D.G: Characterization and allergenic activity of ragweed allergens Ra6, Ra7 and Ra8. American Academy of Allergy, March 1980. . **[Oral]**
13. Marsh, D.G., Freidhoff, L.R., Meyers, D.A., **Hussain, R.** and Lowenstein, H.: Association of atopic allergy with HLA-B8. American Academy of Allergy March 1980. **[Oral]**
14. **Hussain, R.** and Marsh, D.G: Purification, Characterization and allergenic activity of a rapidly released ragweed allergen-Ra6. Fed. Proc. **39**: 1980. . **[Oral]**
15. Marsh, D.G., Meyers, D.A., Freidhoff, L.R., **Hussain, R.**, Hsu, S.H. and Bias, W.B.: Association of HLA phenotypes A1, B8, DW3 and A3, B7, DW2 with allergy, Fed. Proc. **39**: 1980. **[Oral]**
16. Marsh, D.G., Freidhoff, L.R., Meyers, D.A., **Hussain, R.**, Hsu, S.H. and Bias, W.B.: Associations of HLA phenotypes A1, B8, DW3 and A3, DW2 with generalized IgE responsiveness. Fourth International Congress of Immunology, 1980. . **[Oral]**

17. **Hussain, R.**, Hamilton, R.G., Ottesen, W.A. and Adkinson, N.F.: Quantitation of parasite-specific human immunoglobulins: Comparison of RIA and ELISA methods. Am. Soc. Trop. Med. Hyg. 1980. **[Oral]**
18. Ottesen, E.A., **Hussain, R.** and Poindexter, R.W.: A non-immunologic degranulator of human basophils isolated from eggs of *Schistosoma mansoni*. Am. Soc. Trop. Med. Hyg., 1981. . **[Oral]**
19. Kaushal, N.A., **Hussain, R.**, and Ottesen E.A.: Cross reactivity of *Brugia malayi*, antigens in human filariasis and other helminth infections. Fed. Proc. 41: (3) 580, 1982 (abstract # 1812).
20. Weiss, N., Schroeder, H. and **Hussain, R.**: Adaptation of the radioallergosorbent-test (RAST) to the detection of anti-parasite IgE antibodies in tissue-helminth infections. VII. International Congress of Infectious and Parasitic Diseases, Stockholm, Sweden, (June 7-11, 1982).
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