

## RESEARCH CONTRIBUTION:

### RESEARCH GRANTS

#### As Principal Investigator

1. Seroepidemiology of leprosy: To establish a serological assay for leprosy. Funded: The Director's Initiative Fund; World Health Organization TDR Programme (1985) Amount: \$ 15,000 for one year. Collaborating Units: The Aga Khan University, Department of Microbiology, Marie Adelaide Leprosy Centre, Karachi and London School of Hygiene and Tropical Medicine. PI: **Rumina Hasan**, Co-I: Rabia Hussain, Hazel Dockrell.
2. Response of Macrophages and Poly-morphonuclear cells to antigens and antibodies in leprosy. AKU (1986 - 1988) Amount \$ 7,000 for two years. Collaborating Units: The Aga Khan University, Department of Microbiology, Marie Adelaide Leprosy Centre, Karachi and London School of Hygiene and Tropical Medicine PI: **Rumina Hasan**, Co-I: Rabia Hussain, Thomas Chiang, Hazel Dockrell.
3. Synercid: *In-Vitro* Study. Rhone-Poulenc Rorer (1997). Amount Rs. 88,500 and reagents for one year. Collaborating Units: The Aga Khan University, Departments of Microbiology and Medicine. PI: **Rumina Hasan** Co-I: Bushra Jamil.
4. Nosocomial Organism Prevalence and Resistance in Acute and Intensive Care Units. Funded: Merck, Sharp and Dhome Co. Ltd. (1997). Amount Rs. 54,500 and reagents for one year. PI: **Rumina Hasan**
5. Evaluation of Bacteriophage assay for diagnosis of M.tuberculosis infection. BIOTEC (2001-2002). Amount Rs. 300,000 PI: **Rumina Hasan** Co-I: Rabia Hussain
6. Characterization of M.tuberculosis Beijing strains in Pakistan using molecular and immunological techniques: AKU URC (2003-2006). Amount US\$ 36250. Collaborating Units: The Aga Khan University, Department of Microbiology and Marie Adelaide Leprosy Centre, Karachi. PI: **Dr. Rumina Hasan** Co-I: Dr. Rabia Hussain & Dr. Zahra Hasan
7. Antimicrobial resistance in Pakistan; A program to develop and strengthen capacity for surveillance, containment and diagnosis through public-private sector partnership. USAID-S&T (2006-2010). Amount US\$ 575,000. Collaborating Units: The Aga Khan University, Department of Microbiology, Marie Adelaide Leprosy Centre, Karachi. Pakistan Medical Research Council, National Institute of Health, Pakistan. Centres for Disease Control and Prevention, Atlanta USA. Pakistan PI: **Rumina Hasan**, Co-I: Afia Zafar, Anita Zaidi, Rabia Hussain, Zahra Hasan, Amna Rehana Siddiqui, Anwar Siddiqui, Huma Qureshi, Saeeda Haider, Safia Siddiqui, Altaf Ahmed. US PI: Mary Brandt
8. Prevalence of *Mycobacterium tuberculosis* strains in Karachi and their association with drug resistance. Bennendon Society (2006-2010). Amount £ 40,100. Collaborating Units: The Aga Khan University, Department of Microbiology and Marie Adelaide Leprosy Centre, Karachi. PI: **Rumina Hasan**, Co-I: Zahra Hasan
9. Surveillance of resistance to fluoroquinolones and pyrazinamide. World Health Organization (2013-2014). Amount US\$ 178,883. Collaborating Units: The Aga Khan University, Department of Microbiology, National TB Reference Laboratory, Pakistan and World Health Organisation Global TB Programme. PI: **Rumina Hasan**, Co-I: Sabira Tahseen, Joveria Farooqi, Sadia Shakoor.
10. Technical assistance and support by TB supranational Reference Laboratory (SRL) in Karachi for laboratory-strengthening efforts supporting drug resistance surveillance (DRS) related activities in selected countries. World Health Organization (2014-2015). Amount US\$ 126,691. Collaborating Units: The Aga Khan University, Department of Microbiology, National TB Reference Laboratory, Pakistan and World Health Organisation Global TB Programme. PI: **Rumina Hasan**, Co-I: Sabira Tahseen, Joveria Farooqi, Sadia Shakoor.
11. Strengthening Laboratory in Capacity for AMR surveillance. Health Security Partners (HSP). (2015-2016). Amount US\$ 100,000. PI: **Rumina Hasan**, Co-I: Erum Khan, Sadia Shakoor, Joveria Farooqi.
12. Bedaquiline Drug Resistance Emergence Assessment in MDR-TB (Bedaquiline DREAM Program)

- (2015-2019). Janssen Pharmaceutical N.V. Amount US\$ 294,900 Collaborating Units: The Aga Khan University, Department of Microbiology and The National TB Reference Laboratory, Pakistan. PI: **Rumina Hasan**, Co-I: Sadia Shakoor, Joveria Farooqi, Sabira Tahseen
13. Strengthening Laboratory in Capacity for AMR surveillance. Health Security Partners (HSP). (2016-2017). Amount US\$ 80,000. PI: **Rumina Hasan**, Co-I: Erum Khan, Sadia Shakoor, Joveria Farooqi, Kausar Jabeen, Afia Zafar, Imran Ahmed, Mohd. Zeeshan, Seema Irfan, Afia Zafar
  14. Bedaquiline External Quality Assessment (EQA) and Validation of Provisional Breakpoints. Janssen Pharmaceutical N.V. (2017-2018). Amount US\$ 64,000 Collaborating Units: The Aga Khan University, Department of Microbiology and the National TB Reference Laboratory, Pakistan. PI: **Rumina Hasan**, Co-I: Sadia Shakoor, Joveria Farooqi, Sabira Tahseen
  15. Technical assistance for early implementation of Global Antimicrobial Surveillance System {GLASS} in participating laboratories in Pakistan. World Health Organisation (2017-2018) Amount: US\$ 40,000. Collaborating Units: The Aga Khan University, Department of Microbiology, Sheikh Zayed Hospital Lahore, Allama Iqbal University, Lahore. PI: **Rumina Hasan**, Co-I: Sadia Shakoor

#### As Co-Investigator

1. Molecular Markers for prediction of reactions in leprosy. Rockefeller Foundation Grant, Neglected Disease Programme (1987-1990) Amount: \$ 120,000 for three years. Collaborating Units: London School of Hygiene and Tropical Medicine; Aga Khan University, Department of Microbiology.
2. Immunological Evaluation of Purified Recombinant and Synthetic *M.leprae* antigens. WHO, TDR Programme Based Grant (1989-1992). Amount: US\$ 227,358. Collaborating Units: London School of Hygiene and Tropical Medicine; Aga Khan University, Department of Microbiology and Marie Adelaide Leprosy Centre, Karachi. PI: Dr. Rabia Hussain, Co PI: Dr. **Rumina Hasan**, Dr. Hazel Dockrell.
3. Microbiological Evaluation and Community Acceptance of a Plastic Water Storage Vessel with Point-of Use Water Treatment and Hand Washing in Karachi, Pakistan. Funded: Proctor and Gamble (1997-1998). Amount: Rs. 116,000 and equipment for one year. Collaborating Units: The Aga Khan University Hospital, Clinical Laboratory and Department of Community Health Sciences. PI: Steve Luby, Co-I **Rumina Hasan**, M. Agboatwalla, A.Raza, E.Mintz, J.Sobel, S.Hussain, R.Husan, F.Ghouri, K.Baier, G.Gangarosa.
4. Management of Pulmonary Tuberculosis through a low cost facility. Funded: AKU seed money funding (1998). Amount: \$ 8000 for one year. Collaborating Units: The Aga Khan University Hospital, Clinical Laboratory and Department of Community Health Sciences. PI: Amna Rehana Siddiqui, Co-I: **Rumina Hasan**
5. A Prospective study to assess the Relationship between Antibiotic Usage and the Emergence of Antibiotic Resistance in an Intensive Care Unit. Funded: AKU seed money funding (1998). Amount: \$ 2650 for one year. Collaborating Units: The Aga Khan University Hospital, Clinical Laboratory, Pharmacy and Department of Medicine. PI: Arif Sarwari, Co-I: **Rumina Hasan**, Shamim Raza
6. Prevalence of Rota virus Diarrhoea in the Community. Funded: Proctor and Gamble (2000-2001). Amount: Rs. 280,000 for one year. Collaborating Units: The Aga Khan University Hospital, Clinical Laboratory and Department of Community Health Sciences.
7. Extent and factors associated with endemic level of Crimean Congo haemorrhagic fever virus infection in endemic areas Funded: University Research Council (2001-2004). Amount: US\$ 15000. Collaborating Units: The Aga Khan University Departments of Microbiology and Community Health Sciences. PI: Saeed Akhtar, Co-I: **Rumina Hasan**
8. Prevalence and predictors of pulmonary tuberculosis and treatment outcome under DOTS in a low-income neighbourhoods, Karachi. Funded: University Research Council (2001-2004). Amount: US\$ 33540. Collaborating Units: The Aga Khan University Departments of Microbiology and Community Health Science. PI: Saeed Akhtar, Co-I: **Rumina Hasan**
9. An evaluation of the burden and spectrum of respiratory bacterial pathogens in children under five years of age in a community setting in Karachi Pakistan; implication for prevention and therapy. Funded:

- University Research Council (2001-2004). Amount: US\$ 31000. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics. PI: S.Q.Nizami, Co-I: Z. Bhutta, **R. Hasan**, Y.A. Husen
10. Viral etiology of acute aseptic meningitis at AKUH. Funded: AKU seed money grant (2001-2002) Amount US\$ 10000
  11. Genotypic characterisation of Salmonella typhi and S.paratyphi from Karachi. Funded URC. PI: Anita Zaidi, Co-I: **Rumina Hasan**
  12. An estimation of the burden of cholera and shigella diarrhea and related mortality in urban and a rural area of Sindh, Pakistan. Funded IVI DOMI (2001) Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics.
  13. Efficacy of a combined Vi vaccination and health education program on reducing the burden of typhoid during childhood: a demonstration project in Karachi, Pakistan. Funded IVI DOMI (2001) Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics.
  14. Burden of *Haemophilus influenzae* type b disease in Pakistani children. Surveillance of Hib meningitis in Sindh (in collaboration with WHO and Federal EPI Programme. Funded WHO (2003) WHO Multicenter Study of Clinical Signs Predicting Serious Illness (Funded 2003-2004, WHO and Saving Newborn Lives). Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics.
  15. Optimal detection of Salmonella Typhi and Paratyphi in blood of children in Pakistan. The American Society of Tropical Medicine and Hygiene (Funded 2004-2005). Amount US\$ 75,000. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics.
  16. Association of genetic diversity with virulence and antimicrobial resistance in *M. tuberculosis* isolates at The Aga Khan University Hospital, (PhD Student). URC (Funded 2004-2008) Amount US\$ 34000 PI: Asho Ali, Supervisors: **Rumina Hasan**, Zahra Hasan
  17. Enhanced Surveillance of Invasive Pneumococcal Disease (Funded 2005-2006 PneumoADIP) Amount US \$ 30,000. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics
  18. Burden of rotavirus infection in Pakistani children. Rotavirus Vaccine Program and Program for Appropriate Technology in Health. 2005-2007. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics
  19. Population-based surveillance for major pneumococcal syndromes in a rural community of Sindh, Pakistan. PneumoADIP 2006-2007. \$80,000. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics.
  20. National burden estimate of rotavirus gastroenteritis in Pakistan. WHO and Rotavirus vaccine program (2006-2008). Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics
  21. Infectious Diseases and Child Health in Pakistan. NIH, USA Fogarty Training Grant (2006-2011). Focus on training in vaccinology and neonatal infectious disease research. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics
  22. Diarrhea in infants and children in developing countries: case-control study. Gates Enteric Multi-center Study with the Center for Vaccine Development, University of Maryland, Baltimore. Gates Foundation. 2007-2010. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics
  23. Assessment of impact of Hib vaccine in preventing pneumonia and bacterial meningitis in children in Pakistan. Hib Initiative, GAVI 2008-2011. Collaborating Units: The Aga Khan University Departments of Microbiology and Pediatrics
  24. Molecular epidemiology and deletion analysis of mycobacterium tuberculosis strains associated with pulmonary and extra pulmonary tuberculosis (PhD student). URC (Funded 2008-2010) US\$14,500. PI: Akbar Kanji, Supervisors: **Rumina Hasan**, Zahra Hasan
  25. Characterization of drug resistant mutations in XDR strains prevalent in Pakistan – development of rapid assays for screening MTB isolates, TDR WHO 2009-2010 (approved) US\$ 10,000. Collaborating Unit: The Aga Khan University Department of Microbiology. PI: Zahra Hasan, Co-I: **Rumina Hasan**, Asho Ali

26. Prevalence, species distribution, and trends in resistance of fungi responsible for invasive mycoses in Pakistan, USAID-HEC 2010-2013 (approved) US\$ 234,000. Collaborating Unit: The Aga Khan University Department of Microbiology
27. Fluoroquinolone resistance; role of gene mutations and efflux pump among clinical isolates of *Mycobacterium tuberculosis* "AKU seed money (2012-2014). Amount: US\$12,357 Collaborating Unit: The Aga Khan University Department of Microbiology PI: Asho Ali, Co-I: Zahra Hasan, **Rumina Hasan**
28. Evaluation of sensitivity and specificity, rapidity and cost of broth micro-colony detection method for microbiological monitoring of multi-resistant Tuberculosis treatment. URC (Funded 2012-2014) Amount PKR: 2225,940 (US\$25,000). Collaborating Unit: The Aga Khan University Departments of Microbiology
29. Evaluation of Sensitivity and Specificity of GenoType MTB DR<sub>plus</sub> Line Probe Assay in Rapid Diagnosis of Tuberculous Pleural Effusion. URC (Funded 2013-2015) Amount PKR: 2,418,208 (US\$23,000) Collaborating Units: The Aga Khan University Departments of Microbiology and Medicine.
30. Improving diagnosis of pulmonary TB in children using stool specimens as alternative to gastric aspirates using Xpert MTB/RIF assay in a high burden setting. (Funded 2014-2015) \$ 5742. *EMRO/TDR Small Grants Scheme, World Health Organization.*
31. The Role of Arboviruses as a Cause of Undifferentiated Febrile Illness in Sindh Pakistan. Defence Threats Reduction Agency (DTRA). Funded 2014-2017 (US \$515,350.00) Collaborating Units: The Aga Khan University Department of Microbiology and University of Florida
32. Pathogen Surveillance, Outbreak Response, Biosafety and Biosecurity Capacity Development in Pakistan. Funding agency: NIH (September 2014 – September 2016) Amount: US\$ 239879. Collaborating Units: The Aga Khan University Departments of Microbiology and Paediatrics.
33. Assessment of microbial water quality and antibiotic resistance in potable water in two peri-urban slums of Rehri Goth and Bhains Colony, Karachi. IFS. Funded 2015-2016. US\$ 11,900 The Aga Khan University Departments of Microbiology and Paediatrics
34. Characterization of human immunodeficiency virus (HIV)-1 among newly diagnosed treatment-naive Pakistani patients. Blood Systems Research Institute. Funded (Aug 2015-Aug 2016). US\$ 25,000 The Aga Khan University Department of Microbiology, Bridge Foundation, Duke University Medical Center US and Blood Systems Research Institute, San Francisco, California. PI: Zahra Hasan, Co-I: **Rumina Hasan**, Sharaf Ali Shah et al
35. How do policymaker perceptions of antimicrobial resistance drive behaviour and policies for appropriate antimicrobial use? A case study of Pakistan. Funded (March 2017- September 2018) (Aga Khan University, LSHTM, Royal Veterinary College). £100,000 PI: Johanna Hanefeld, Co-I: Mishal Khan, Ana Mateus, **Rumina Hasan**.
36. Novel inter-disciplinary approaches for identifying and tackling the spread of AntiMicrobial Resistance through Environmental pathways in Pakistan Funded (October 2017- March 2018). £80,000 PI Chris Quince/Sadia Shakoor, Co-I: **Rumina Hasan**, Elizabeth Wellington
37. From latent tuberculosis to active TB: understanding the mechanism of disease progression in Diabetes with reference to suppressor of cytokine signalling molecules (SOCS). Funded HEC, Pakistan. Rs. 13,770,476. PI Zahra Hasan, Co-I: **Rumina Hasan**, Mohd Irfan, Bushra Jamil et al.

## PUBLICATIONS

1. Nalin D, **Hasan, R**, Haque, S, and Boltosky, H. Association between Malaria, Immunosuppression and relatively high risk for diarrhoeal attacks. New prospects for Treatment and Prevention, ed. by Holme, T., Holmegren, J., Merson, M.H., and Mollby R. Elsevier/North Holland Biomedical Press, (1981).
2. Dockrell, H.M., Chiang, T., Grant, K.A., Jouy, N.F., **Hasan, R.**, Hussain, R., Jackson, M., Lee, S.P., Stoker, N.G., McAdam, K.P.W.J. Immune recognition of the 18kDa protein from *Mycobacterium leprae*. (1988) Health Cooperation Papers 653.
3. Dockrell, H.M., Stoker, N.G., Lee, S.P., Jackson, M., Grant, K.A., Jouy, N.F., Lucas, S.B., **Hasan, R.**,

- Hussain, R., McAdam, K.P.W.J., T cell recognition of the 18kD antigen *Mycobacterium leprae*. Infect. Immun. 1989; 57(7): 1979-1983.
4. Rasheed, F.N., Locniskar, M., McCloskey, D.J., **Hasan, R.**, Chiang, T.J., Rose, P., Soldenhoff, R.de., Festenstein, H., and McAdam, K.P.W.J. Serum lymphocytotoxic activity in leprosy. Clin. Exp. Immunol. 1989; 76:391
  5. **Hasan, R.**, Dockrell H., Chiang, T., Hussain, R. Quantitative Antibody Elisa for Leprosy. Int. J. Lep. 1989; 57 (4): 766-776
  6. Hussain, R., Jamil, S., Kifayet, A., Firdausi, F., Dockrell, H., Lucas, S., **Hasan, R.** Quantitations of IgM antibodies to the *M. leprae* synthetic disaccharide can predict early bacterial multiplication in leprosy. Int. J. Lep. 1990; 58(3): 491-502
  7. **Hasan, R.**, Hussain and A.W. Sturm. The diagnosis of tuberculosis. Pakistan J. Surg. 1990; 6: 86-88.
  8. Rasheed, F.N., Locniskar, M., McCloskey, D.J., **Hasan, R.**, Chiang, T.J., Rose, P., Soldenhoff, R.de., Festenstein, H., and McAdam K.P.W.J. Specificity of lymphocytotoxic Auto antibodies (LCABs) found in the serum of leprosy patients: Class I MHC Antigens. Lep. Rev. 1992; 62, 13-20.
  9. Hussain, R., Jamil, S., Kifayet, A., Dockrell, H., Zaman, V., and **Hasan, R.** Detection of high titers of *T. gondii* antibodies in sera of patients with leprosy in Pakistan. Trans. Roy. Soc. Trop. Med. Hyg. 1992; 86:259-262
  10. **Hasan, R.**, Jamil, S., Dockrell, Hazel, Chiang, T.J., and Hussain, R. Antigen coated latex particles as a model system for probing monocyte responses in leprosy. Infection and Immunity 1993; 61: 3724-3729.
  11. Hussain, R., **Hasan, R.**, Khurshid, M., Sturm, A.W., Ellner, J.J. and Dawood, G. Pulmonary tuberculosis in a BCG vaccinated: relationship of disease severity with immunological and haematological parameters and drug resistance patterns. S.E. Asian J. Trop. Med. Pub. Hlth 1996; 27(2) 257-262
  12. Nazir, Z., **Hasan, R.**, Pervaiz, S., Alam, M. and Moazam, F. Invasive retroperitoneal infection due to *Basidiobolus vanarum* in an 8 year old boy. A case report and review of literature. Annals of Tropical Paediatrics 1996; 17: 161-164.
  13. Hussain, R., Toossi, Z., **Hasan, R.**, Jamil, B., Dawood, G, Ellner, J.J. Immune response profile in patients with active tuberculosis in a BCG vaccinated area. S.E. Asian J. Trop. Med. Pub. Hlth. 1997; 28: 764-773
  14. **Hasan, Rumina.** Diagnosis of *Chlamydia trachomatis* infections 1997. Infectious Diseases Journal of Pakistan.
  15. Mufti, P., Bhutta, ZA., **Hasan, R.** Acute gastroenteritis caused by E. coli O157:H7 in Pakistani Children. J. Tropical Pediatrics 1999; 45(4): 253-4
  16. Luby, S., Agboatwallah, M., Raza A, Sobel, J., A., Mintz, E., Baier K., Rahbar M, Quereshi S, **Hasan R**, Ghouri F, Hoekstra, M, Gangarosa, E. A low-cost Intervention for Cleaner Drinking Water in Karachi, Pakistan. International Journal of Infectious Diseases 2001; 5 (3); 144-150.
  17. Luby, S., Agboatwallah, M., Raza A, Sobel, J., A., Mintz, E., Baier K., Hoekstra, M, Rahbar M, **Hasan R**, Quereshi S, Gangarosa, E. Microbiological effectiveness of hand washing with soap in an urban squatter settlement, Karachi, Pakistan. Epidemiol Infect. 2001; 127; 237-244.
  18. Zaidi Y, Hastings M, Murray J, **Hasan R**, Khurshid M, Mahendra P. Quinolone resistance in neutropenic patients: the effect of prescribing policy in the UK and Pakistan. Clin Lab. Haem. 2001; 23; 39-42.
  19. **Hasan R**, Babar SI. Nosocomial and ventilator associated pneumonias. Developing country perspective. Current Opinions in Pulmonary Medicine 2002; Volume 8 (3) (Invited review)
  20. Erum Khan, Iqbal Azam, Shahid Ahmed, **Rumina Hasan.** Diagnosis of Typhoid Fever by Dot Enzyme Immunoassay in an Endemic Region. J. Pakistan Medical Association 2002; 52(9): 415-417.
  21. Erum Khan, Arif Sarwari, **Rumina Hasan**, Salma Ghori, Ijlal Babar, Frances O'Brien, Warren Grubb. Emergence of Vancomycin-Resistant *Enterococcus faecium* at a Tertiary Care Hospital in Karachi, Pakistan. J. Hospital Infection 2002; 52(4); 292-296.
  22. Erum Khan, **Rumina Hasan**, Afia Zafar. Sever Acute Respiratory Syndrome- A Review (invited review) Infectious Diseases Journal 2003; 12(2): 47-48.

23. Bushra Jamil, Syed Tanvir Ahsan, Hasnain Zafar, **Rumina Hasan** Caesarian section wound infection: Pathogen or contaminants? (A case report) *Infectious Diseases Journal* 2003; 12(2): 57-58.
24. Kauser Jabeen, **Rumina Hasan** Resurgence of *Vibrio cholere* 0139 in Pakistan. *J. Pakistan Medical Association* 2003; 53(8): 335-338
25. Kauser Jabeen , Afia Zafar, **Rumina Hasan**. Comparison of Combined disc and double disc method for the detection of ESBL. *J Pakistan Medical Association* 2003; 53(11): 534-536.
26. Anita K.M. Zaidi, **Rumina Hasan**, Zulfiqar A.Bhutta, Typhoid Fever (Letter to the editor) *New England Journal of Medicine* 2003; 348(12): 1182-84.
27. Afia Zafar, **Rumina Hasan**, Nasim Sabir. Use of contaminated drug and its implication: Developing world scenario. (Letter to the editor) *Lancet* 2003; 362: 169-170.
28. Yawar M. Yacooob, Qaisar Hasan, **Rumina Hasan** Penicillin Resistant *Streptococcus pneumoniae* at a tertiary care centre in Pakistan. *Tropical Doctor* 2004; 34(2): 121-2.
29. Nazish Gul Ibrahim, Afia Zafar, **Rumina Hasan**. Evaluation of frequency of isolation and trends in antibiotic resistance among *Campylobacter* isolates over 11-year period. *J Pakistan Medical Association*. *J. Pakistan Medical Association* 2004; 54(6): 291-294.
30. Nasim Sabir, Erum Khan, Latif Sheikh, **Rumina Hasan**. Impact of antibiotic usage on resistance in micro-organisms; Urinary tract infection with *E. coli* as a case in point. *J Pakistan Medical Association* 2004; 54(9): 472-5.
31. R. Hewson, J. Chamberlain, G. Lloyd, B. Jamil, **R. Hasan**, A. Gmyl, L Gmyl, S. E. Smirnova, A. Lukashev, G. Karganova and C. Clegg. Crimean - Congo haemorrhagic fever virus: Sequence analysis of the Small RNA segment from a collection of viruses worldwide. *Virus Research* 2004; 15; 102(2): 185-9.
32. Arif Sarwari, **Rumina Hasan**, Chuan Bian Lim, Yvonne Ng, Charis Ng, and Sara Zaman PCR identification and automated ribotyping of *Pseudomonas aeruginosa* clinical isolates from intensive care patients. *Scandinavian J. Infectious Diseases* 2004 36(5): 324-9.
33. Roger Hewson, Anatoliy Gmyl, Larissa Gmyl, Svetlana E. Smirnova, Galina Karganova, Bushra Jamil, **Rumina Hasan**, John Chamberlain and Christopher Clegg. Evidence of segment reassortment in Congo Crimean Haemorrhagic Fever Virus. *J. General Virology* 2004; 85: 3059-3070.
34. John Wain, Deborah House, Afia Zafar, Stephen Baker, Sateesh Naire, Claire Kidgell, Zulfiqar Bhutta, Gordon Dougan and **Rumina Hasan**. Vi antigen expression in *Salmonella enterica* serovar Typhi clinical isolates from Pakistan. *J. Clin. Microbiology* 2005; 43(3): 1158-65
35. S.Q.Nizami, Z. Bhutta, **R. Hasan**, Y.A. Husen. Role of chest X'ray in diagnosis of lower respiratory tract infections in children less than 5 years of age in community. *Pakistan J. Medical Science* 2005; 21(4): 417-421.
36. Kauser Jabeen , Afia Zafar, **Rumina Hasan**. Frequency and sensitivity pattern of Extended Spectrum beta Lactamase producing isolates in a tertiary care hospital laboratory of Pakistan. *J. Pakistan Medical Association* 2005; 55(10): 436-439.
37. Zafar A, Ibrahim NG, Ahsan T, Abbas Z, Zaidi A, **Hasan R**. Naladixic acid screening test in detection of decreased fluoroquinolone susceptibility in *Salmonella typhi* isolated from blood. *J. Coll Physicians Surg Pak*. 2005; 15(7); 413-417.
38. Bushra Jamil, **Rumina Hasan**, Arif Sarwari, Chris Clegg, Roger Hewson, Jane Burton. Crimean-Congo Haemorrhagic fever: Experience at a tertiary care hospital in Karachi, Pakistan. *Transactions Royal Society of Tropical Medicine and Hygiene* 2005; 99, 577-584.
39. **R. Hasan**, Cooke FJ, Nair S, Harish BN, Wain J. Typhoid and paratyphoid fever. *Lancet* 2005; 366(9497): 1603-1604.
40. Shaikh Qamaruddin Nizami, Zulfiqar Ahmed Bhutta, **Rumina Hasan**. Incidence of acute respiratory infections in children 2 month to 5 years of age in periurban communities in Karachi, Pakistan. *J. Pakistan Medical Association* 2006; 56(4): 163-167.

41. Seema Irfan, Qaiser Hassan, **Rumina Hasan**. Assessment of primary resistance in multi-drug resistance (MDR) tuberculosis patient. J Pak Med Assoc. 2006 Sep; 56(9):397-400.
42. Kausar Jabeen, Erum Khan, **Rumina Hasan**. Emergence of quinolone resistant *Neisseria gonorrhoea* in Pakistan. J. Sexually Trans Diseases and Aids 2006; 17(1): 30-33
43. F.J. Siddiqui, F. Rabbani, **R. Hasan**, S.Q.Nizami, Z.A. Bhutta. Typhoid fever in children: some epidemiological considerations from Karachi, Pakistan. Int. J. Infect. Dis. May 2006; 10(3): 215-22 [Epub ahead of print].
44. Zahra Hasan, Mahnaz Tanveer, Akbar Kanji, Qaisar Hasan, Solomon Ghebremichael, **Rumina Hasan**. Spoligotyping of *Mycobacterium tuberculosis* isolates in Pakistan reveals MDR associated Beijing strains and the predominance of a Central Asian type strain. J. Clinical Microbiology May 2006; 44(5): 1763-1768.
45. Khan MI, Sahito SM, Khan MJ, Wassan SM, Shaikh AW, Maheshwari AK, Acosta CJ, Galindo CM, Ochiai RL, Rasool S, Peerwani S, Puri MK, Ali M, Zafar A, **Hasan R**, von Seidlein L, Clemens JD, Nizami SQ, Bhutta ZA. Enhanced disease surveillance through private health care sector cooperation in Karachi, Pakistan: experience from a vaccine trial. Bull World Health Organ. 2006 Jan; 84(1):72-7. Epub 2006 Feb 23.
46. Seema Irfan, **Rumina Hasan**, Akber.Kanji, Qaiser Hassan, Iqbal Azam. Evaluation of microcolony detection method and phage assay for rapid detection of *Mycobacterium tuberculosis* complex in sputum sample. Southeast Asian J Trop Med and Public Health 2006; 37(6): 1187-95
47. **Hasan R**, Irfan S. MODS assay for the diagnosis of TB. (Letter to the Editor) N Engl J Med. 2007 Jan 11;356(2):188;
48. Bushra Jamil, **Rumina Hasan**, Afia Zafar, Kevin Bewley, John Chamberlain, Valerie Mioulet, Moira Rowlands, Roger Hewson. DENV-3 outbreak in Karachi, Pakistan. Emerging Infectious Diseases 2007; 13(1): 182-182.
49. Afia Zafar, Robert Swanepoel, Roger Hewson, Mazhar Nizam, Altaf Ahmed, Akhtar Husain, Antoinette Grobbelaar, Kevin Bewley, Valerie Mioulet, A. Barry Dowsett., Linda Easterbrook, **Rumina Hasan**. Report of multicenter outbreak of Buffalopox virus infection in Burns Units. Emerging Infectious Diseases, 2007; Jun; 13(6):902-4.
50. Holt KE, Thomson NR, Wain J, Phan MD, Nair S, **Hasan R**, Bhutta ZA, Quail MA, Norbertczak H, Walker D, Dougan G, Parkhill J. Multidrug-resistant *Salmonella enterica* serovar Paratyphi A harbour IncHI1 plasmids similar to those found in serovar Typhi. J.Bacteriol. 2007; Jun; 189(11):4257-64. Epub 2007 Mar 23.
51. Saeed Akhtar, Franklin White, **Rumina Hasan**, Shafquat Rozi, Mohammad Yunus, Faiza Ahmed, Sara Husain and Bilquis S Khan. Hyperendemic pulmonary tuberculosis in peri-urban areas of Karachi, Pakistan. Biomedical Central (BMC) Public Health 2007; May 3; 7: 70.
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