SANJAY JAIN, M.D.

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PERSONAL DATA

Birth: November 26 1975, Halifax, Canada Sex: Male

Marital Status: Single

MEDICAL EDUCATION

Aug 1993 – Jan 1999	Medical School, All India Institute of Medical Sciences, New Delhi, India

POST GRADUATE APPOINTMENTS

Jan 1999 – Jun 1999	House Officer in Neuro-Radiology, All India Institute of Medical Sciences, New Delhi, India
Jul 1999 – Jun 2000	Pediatric Internship, PennState Children's Hospital, Milton S Hershey Medical Center, Hershey, PA
Jul 2000 – Jun 2002	Clinical Associate, Tufts University School of Medicine, Floating Hospital for Children, New England Medical Center, Boston, MA
Jul 2000 – Jun 2002	Pediatric Resident, Tufts University School of Medicine, Floating Hospital for Children, New England Medical Center, Boston, MA
Jul 2002 – Jun 2005	Clinical Fellow, Pediatric Infectious Diseases, Johns Hopkins School of Medicine, Baltimore, MD
Jul 2005 – Jun 2006	Instructor of Pediatrics, Johns Hopkins School of Medicine, Baltimore, MD
Jul 2006 – present	Assistant Professor of Pediatrics, Johns Hopkins School of Medicine, Baltimore, MD

CERTIFICATION / LICENSURE

M.B;B.S (Bachelor of Medicine, Bachelor of Surgery)	Jan 1999
Medical Council of India	Jan 1999
ECFMG Certificate	Jun 1999
Diplomate in Pediatrics, American Board of Pediatrics	Jan 2003
American Board of Pediatric Infectious Diseases	Aug 2005
Maryland State License	Current

AWARDS, RECOGNITION AND PRESS

Chair: Tools session, TB Drug Accelerator Meeting, Gates Foundation	2009
Organizing member, TB Drug Accelerator Meeting, Gates Foundation	2009
 Named Maryland's Innovator of the Year, The Daily Record	2008
Featured as Pediatric TB Expert in Baltimore Examiner	2008
"Maryland TB cases draw attention to rare infection"	

Named amongst *America's Best and the Brightest in the Arts, Sciences and Social change,* The Genius Issue & Innovators of 2007, Esquire Magazine	2007
Featured in 'Two Indians among Esquire's Best', Hindustan Times (INDIA)	2007
Featured in 'Names in News', Baltimore Sun	2007
Featured in 'On the trail of TB', Baltimore Business Journal	2007
Featured as TB Expert in USDA DVD "The Soil Explorers"	2007
Program Choice Award at the IDSA	2005
Bill and Melinda Gates' Foundation Education scholarship Tuberculosis: Integrating Host and Pathogen Biology	2005
Pediatric Infectious Diseases Society Award at the IDSA	2005
IDSA Special citation for fellow-in-training	2005
Fellows Travel Award at the IDSA	2005
American Pediatric Society & Society for Pediatric Research Young Investigator's Travel Award	2005
Clinician Scientist Award, Johns Hopkins University	2005-07
Baurenschmidt Postdoctoral Research Fellowship	2003-04
Adarsh A Kumar Award for best oral presentation	2001
Sir Dorabji Tata Prize for the *best student in Biochemistry*	1994

PATENTS (LEAD INVENTOR)

1. US patent **USPA # 12/016,465**, '*Mycobacterium tuberculosis* persistence genes'.
2. International patent **PCT/US08/51413**, '*Mycobacterium tuberculosis* persistence genes'.
3. Report of invention, **D10139**, 'Metal ion labeled mycobactin for diagnosis and monitoring of mycobacterial disease and infection'.
4. Report of invention, **C10401**, 'Real-time evaluation of *Mycobacterium tuberculosis* bacterial burden in animal models of TB'.
5. Report of invention, **C10695**, 'Biosafety Level (BSL)-3 Life-support Cell for Studying Live Animals'.

REVIEW WORK

USDA's National Research Initiative Competitive Grants Program

NIH NIAID

Journals:

American Journal of Respiratory Cell and Molecular Biology
BMC Infectious Diseases
Cellular Microbiology
European Respiratory Journal, Infection and Immunity
International Journal of Tuberculosis and Lung Diseases
Journal of Clinical Microbiology
Journal of Infectious Diseases
Microbiology
Molecular Microbiology
Pediatrics
PLoS Pathogens

STUDENTS MENTORED AT JOHNS HOPKINS

High school: Barathi Sivasailam (Centennial High) – now a freshman at Brown University

Undergraduate: Michelle Jang (JHU)

Medical student: Swaroop Samant (JHU), Prabhpreet Singh (AIIMS, India), Harkirat Singh (AIIMS, India), Sohail Qayyum (Rawalpindi Medical College, Pakistan)

MPH student: Mohammed Iqbal (JHU)

Graduate student (PhD candidate): Nick Be (Molecular and Cell Biology Program, JHU)

Several clinical residents and fellows at Johns Hopkins

PEER REVIEWED PUBLICATIONS

1. **Jain SK**, Deepak KK. Cost Effective Computerized Analysis of Biological Signals. *Indian J Physiol Pharmacol* 1995; 39(4): 389-394.
2. **Jain SK**. Index of suspicion. Case 3. Diagnosis: Jaundice. Pediatr Rev. 2001 Aug;22(8):271-6.
3. **Jain SK**, Gupta A, Glanz B, Dick J, Siberry GK. Antimicrobial-resistant *Shigella sonnei*: Limited antimicrobial treatment options for children and challenges of interpreting *in vitro* azithromycin susceptibility. Pediatr Infect Dis J. 2005 Jun;24(6):494-497.
4. **Jain SK**, Persaud D, Perl TM, Pass MA, Murphy KM, Pisciotta JM, Scholl PF, Casella JF, Sullivan DJ. Nosocomial Malaria and Saline Flush. Emerg Infect Dis. 2005 July;11(7):1097-99.
5. **Jain SK,** Kwon P, Moss WJ. Management and outcomes of intracranial tuberculomas developing during antituberculous therapy: case report and review. Clin Pediatr (Phila). 2005 Jun;44(5):443-50.
6. **Jain SK**, Tunkel DE, Bishai WR. Management of Acute Rhinosinusitis, Bronchitis Syndromes, and Acute Otitis Media. Adv Stud Med. 2005; 5(7):344-350.
7. Bhally HS, **Jain S**, Shields C, Halsey N, Cristofalo E, Merz WG. Infection in a neonate caused by Pichia fabianii: importance of molecular identification. Med Mycol. 2006 Mar;44(2):185-7.
8. **Jain SK,** Paul-Satyaseela M, Lamichhane G, Kim KS, Bishai WR. *Mycobacterium tuberculosis* Invasion and Traversal across an In Vitro Human Blood-Brain Barrier as a Pathogenic Mechanism for Central Nervous System Tuberculosis. J Infect Dis. 2006 May 1;193(9):1287-95.
9. **Jain SK,** Bishai WR. Adherence, treatment success, and resistance. Infect Dis Clin Pract. 2006 July 14(4) Supplement 4:S15-S18.
10. Hernandez-Abanto S, Woolwine SC, **Jain SK**, Bishai WR. Tetracycline-inducible gene expression in mycobacteria within an animal host using Streptomyces-derived tetO and tetR regulatory elements. Arch Microbiol. 2006 Dec;186(6):459-64.
11. **Jain SK,** Hernandez-Abanto S, Cheng Q, Singh P, Ly LH, Klinkenberg G, Morrison NE, Converse PJ, Nuermberger E, Grosset J, McMurray DN, Karakousis PC, Lamichhane G, Bishai WR. Accelerated detection of *Mycobacterium tuberculosis* genes essential for bacterial survival in guinea pigs compared with mice. J Infect Dis. 2007 Jun 1;195(11):1634-42.
12. **Jain SK**, Lamichhane G, Nimmagadda S, Pomper M, Bishai WR. Antibiotic Treatment of Tuberculosis: Old Problems, New Solutions. Microbe 2008 Jun; 3(6): 285-92.

13. Be N, Lamichhane G, Grosset J, Tyagi S, Cheng Q, Kim KS, Bishai WR, **Jain SK.** Murine model to study Invasion and Survival of Mycobacterium tuberculosis in the Central Nervous System. J Infect Dis. 2008 Nov 15;198(10):1520-8.
14. Be N, Lamichhane G, Grosset J, Tyagi S, Cheng Q, Kim KS, Bishai WR, **Jain SK.** Cover Page picture. J Infect Dis. 2008 Nov 15;198(10).
15. Agwu AL, Lee CK, **Jain SK**, Murray KL, Topolski J, Miller, RE, Townsend T, Lehmann CU. A World Wide Web-based antimicrobial stewardship program improves efficiency, communication, and user satisfaction and reduces cost in a tertiary care pediatric medical center. Clin Infect Dis. 2008 Sep 15;47(6):747-53.
16. Converse PJ, Karakousis PC, Klinkenberg KC, Kesavan AK, Ly LH, Allen SS, Grosset JH, **Jain SK**, Lamichhane G, Manabe YC, McMurray DN, Nuermberger EL, Bishai WR. The role of the dosR/dosS two-component regulatory system in Mycobacterium tuberculosis virulence in three animal models. Infect Immun. 2009 Mar;77(3):1230-7.
17. Be N, Kim KS, Bishai WR, **Jain SK**. Pathogenesis of Central Nervous System Tuberculosis. Curr Mol Med. 2009 Mar;9(2):94-9.
18. Vidal C, Hewitt J, Davis S, Younes L, **Jain S**, Jedynak B. Template Registration with missing parts: Application to the Segmentation of Tuberculosis infected lungs. Proceedings of the IEEE International Symposium on Biomedical Images (in press).
19. Davis SL, Nuermberger EL, Um P, Vidal C, Jedynak B, Pomper MG, Bishai WR, **Jain SK**. Monitoring response to TB drug treatment using [^{18}F]-2-fluoro-deoxy-D-glucose positron emission tomography (submitted).
20. Davis S, Be N, Lamichhane G, Nimmagadda S, Bishai WR, Pomper MG, **Jain SK**. Imaging *Mycobacterium tuberculosis* with radiolabeled 1-(2'-deoxy-2'-fluoro-beta-D-arabinofuranosyl)-5-iodouracil (in preparation).

CONFERENCE ABSTRACTS

1. Siberry KG, Glanz B, **Jain SK**, Gupta A. Antibiotic-Resistant Shigella Outbreak – Baltimore 2002. Abstract #875, Poster Presentation at the 41st Annual Meeting of the Infectious Diseases Society of America (IDSA), Oct 2003
2. **Jain SK**, Moss W. Intracranial tuberculoma during effective anti-TB therapy. Abstract #9, Poster Presentation at the St. Jude / PIDS Pediatric Microbial Research Conference, Feb 2004
3. Pass MA, **Jain SK**, Sullivan DJ, Mackie K, Winkler A, Perl TM. Nosocomial Transmission of Malaria. Patient Safety Session at The Society for Healthcare Epidemiology of America (SHEA), Apr 2004
4. Siberry KG, **Jain SK**, Glanz B. Azithromycin Susceptibility Testing for *Shigella sonnei*. Abstract #558, Poster presentation at the 42nd Annual Meeting of the Infectious Diseases Society of America (IDSA), Sep-Oct 2004
5. **Jain SK**, Paul-Satyaseela M, Lamichhane G, Kim KS, Bishai WR. *Mycobacterium tuberculosis* invade and traverse an *in vitro* human blood brain barrier. Abstract #2030, Poster presentation at the Tuberculosis: Integrating Host and Pathogen Biology (D1), Keystone Symposia, April 2005.
6. **Jain SK,** Paul-Satyaseela M, Lamichhane G, Bishai WR, Kim KS. *Mycobacterium tuberculosis* invasion and traversal across an *in vitro* human blood brain barrier as a pathogenic mechanism for CNS tuberculosis. Abstract #1391, Poster presentation at the Pediatric Academic Societies' Annual Meeting, May 2005.
7. **Jain SK**, Paul-Satyaseela M, Lamichhane G, Kim KS, Bishai WR. An in vitro human blood brain barrier model to study CNS tuberculosis. Presentation number #21, Oral

presentation at the 43rd Annual Meeting of the Infectious Diseases Society of America (IDSA), Oct 2005

8. Lee C, Agwu A, **Jain SK**, Murray K, Topolski J, Miller R, Townsend T, Kim KS, Lehmann C. Web-based system Improves a Restricted Antibiotic Approval Program. Poster presentation at the Partners in Paediatric Patient Safety, Toronto, ON, Canada. June 2006.
9. Agwu A, Lee C, **Jain SK**, Murray K, Topolski J, Miller R, Townsend T, Kim KS, Lehmann C. A Novel Web-Based Antimicrobial Approval Program Improves Efficiency, Communication, User Satisfaction, and Results in Significant Cost-savings. Poster presentation at the American Academy of Pediatrics 2006 National Conference and Exhibition, Atlanta, GA. October 2006.
10. Agwu A, Lee C, **Jain SK**, Murray K, Topolski J, Miller R, Townsend T, Kim KS, Lehmann C. Development of a Web-Based System Improves a Restricted Antibiotic Approval Program. Presentation at the 44th Annual Meeting of the Infectious Diseases Society of America (IDSA), Oct 2006.
11. **Jain SK,** Grosset J, Tyagi S, Kim KS, Bishai WR. Animal model to study CNS invasion by *Mycobacterium tuberculosis*. Presentation at the 44th Annual Meeting of the Infectious Diseases Society of America (IDSA), Oct 2006.
12. **Jain SK,** Hernandez-Abanto S, Cheng Q, Singh P, Ly LH, Klinkenberg G, Morrison NE, Converse PJ, Nuermberger E, Grosset J, McMurray DN, Karakousis PC, Lamichhane G, Bishai WR. Accelerated detection of *Mycobacterium tuberculosis* genes essential for bacterial survival in guinea pigs compared with mice Abstract #256, Poster presentation at the Tuberculosis: Integrating Host and Pathogen Biology (C6), Keystone Symposia, March 2007.
13. Converse PJ, Karakousis PC, Allen SS, Grosset JH, Klinkenberg LG, Ly LH, **Jain SK**, Lamichhane G, Manabe YC, McMurray DN, Nuermberger EL, Sherman DR, Bishai WR. Comparative Animal Model Testing in Three Species Reveals that the of *Mycobacterium tuberculosis dosR* Gene is Required for Virulence Poster presentation at the Tuberculosis: Integrating Host and Pathogen Biology (C6), Keystone Symposia, March 2007.
14. Be N, Grosset J, Tyagi S, Kim KS, Bishai WR, **Jain SK**. Animal model to study CNS invasion by *Mycobacterium tuberculosis*. Abstract #125, Poster presentation at the Tuberculosis: Integrating Host and Pathogen Biology (C6), Keystone Symposia, March 2007.
15. **Jain SK**, Nimmagadda S, Be N, Pomper MG, Bishai WR. Real time *in vivo* imaging of mycobacterial infection. Abstract #1743, Poster presentation at the 45th Annual Meeting of the Infectious Diseases Society of America (IDSA), Oct 2007
16. Davis S, Um P, Lamichhane G, Nimmagadda S, Pomper MG, Bishai WR, **Jain SK**. Real time imaging of live TB-infected animals. Poster presentation at the US-Japan TB/Leprosy Conference, July 2008
17. Be NA, Klinkenberg LG, Karakousis PC, Bishai WR, **Jain SK**. Dissemination of *M. tuberculosis* to the guinea pig central nervous system. Poster presentation at the US-Japan TB/Leprosy Conference, July 2008
18. Davis S, Um P, Lamichhane G, Nimmagadda S, Pomper MG, Bishai WR, **Jain SK**. Real time non-invasive assessment of inflammation and bacterial load in live TB-infected animals. Abstract #294, Oral presentation at the 2008 World Molecular Imaging Congress, September 2008
19. Be NA, Klinkenberg LG, Karakousis PC, Bishai WR, **Jain SK**. Disseminated Central Nervous System Tuberculosis Following Aerosol Infection in the Guinea Pig. Abstract

#5125, Oral presentation at the 48th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) / 46th Infectious Diseases Society of America (IDSA) Annual Meeting, October 2008

20. Davis S, Um P, Lamichhane G, Nimmagadda S, Pomper MG, Bishai WR, **Jain SK**. Monitoring Disease in Animal Models of TB - The 21st Century: Non-invasive, Real-time, in Live Animals. Abstract #4820, Oral presentation at the 48th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) / 46th Infectious Diseases Society of America (IDSA) Annual Meeting, October 2008
21. Be NA, Klinkenberg LG, Karakousis PC, Bishai WR, **Jain SK**. Strain-dependent CNS invasion in Guinea Pig after aerosol challenge with Mycobacterium tuberculosis. #126, Poster presentation at the Tuberculosis: Tuberculosis: Biology, Pathology and Therapy (B3), Keystone Symposia, January 2009.
22. Davis S, Um P, Lamichhane G, Nimmagadda S, Pomper MG, Bishai WR, **Jain SK**. Real-time Non-invasive Assessment of TB disease in Live Animals. #178, Poster presentation at the Tuberculosis: Tuberculosis: Biology, Pathology and Therapy (B3), Keystone Symposia, January 2009.
23. Dutta NK, Mehra S, LeBreton SL, Lamichhane G, **Jain SK**, Bishai WR, Didier P, Lackner AA, Kaushal D. Discovery of genes essential for survival and persistence of Mycobacterium tuberculosis in a Nonhuman Primate model of TB. #189, Poster presentation at the Tuberculosis: Tuberculosis: Biology, Pathology and Therapy (B3), Keystone Symposia, January 2009.

BOOK CHAPTERS

1. George AL, **Jain SK**. Infectious Diseases. In "First Aid for the Pediatric Boards", T. Le, W. Lam, S. Rabizadeh, A. Schroeder, K. Vera (eds). 2006. McGraw-Hill.
2. Akar N, Bishai WR, **Jain SK**. *Streptococcus pneumoniae*: Resistance Update and Treatment Options. In Antimicrobial Resistance: Modern Principles and Management Strategies. R Owens, E Lautenbach (eds). 2007. Marcel Dekker, Inc., N.Y., Publisher.
3. **Jain SK**, Bishai W and Nightingale C. Macrolide, Azalide and Ketolides. In Antimicrobial Pharmacodynamics in Theory and Clinical Practice: Second Edition, Revised and Expanded. C.H. Nightingale, G. Drusano, P.G. Ambrose and T. Murakawa (eds). 2007. Marcel Dekker, Inc., N.Y., Publisher.
4. George-Agwu A, Milstone A, **Jain SK**. Recommended Empiric Antimicrobial Therapy for Selected Clinical Syndromes. In "The Harriet Lane Handbook of Pediatric Antimicrobial Therapy", J.A. McMillan, C.K. Lee, G.K. Siberry, and J.D. Dick and (eds). 2008. Mosby-Elsevier.
5. Be N, **Jain SK**, Bishai WR. Pathogenesis of Tuberculosis: New Insights (in press)

INVITED LECTURES AND TALKS

1. Aug 2001: **Pneumococcal Infections and the PCV7 vaccine.** AIIMSONIANS of America Annual meeting, Boston, MA
2. Jul 2003: **Clinical presentation.** Maryland State Health Department, Annapolis, MD
3. Aug 2003: **TB case presentation.** Maryland State Health Department, Annapolis, MD
4. Oct 2003: **Yearly TB update.** Maryland Department of Health and Mental Hygiene, Baltimore MD
5. Oct 2004: **Grand rounds 'To Be or not To Be'**. Department of Pediatrics, University of Illinois, Peoria, IL

6. Apr 2005: **Pediatric Tuberculosis: *The common and the not so common . . .*** 33rd Annual Pediatric Trends, Johns Hopkins University, Baltimore, MD
7. Aug 2005: **Tuberculosis in children**. Summer Institute in Tropical Medicine and Public Health, Bloomberg School of Public Health, Baltimore, MD
8. Jan 2006: **CNS lesions in children in the Tropics.** Winter Institute in Tropical Medicine and Public Health, Bloomberg School of Public Health, Baltimore, MD
9. Jan 2006: **A blood brain barrier model to study invasion of *M. tuberculosis* into the CNS.** Combined Adult and Pediatric Infectious Diseases Research Talk, Johns Hopkins University School of Medicine, Baltimore, MD
10. Mar 2006: **Pathogenesis of CNS tuberculosis: *M. tuberculosis* interaction with the Blood-brain barrier.** Lecture at the Department of Tuberculosis & Respiratory Diseases, Vallabhbhai Patel Chest Institute, New Delhi, INDIA
11. May 2006: **Pathogenesis of CNS tuberculosis: *M. tuberculosis* and the blood-brain barrier.** Center for Tuberculosis Research Annual Scientific Meeting, Baltimore, MD
12. Jun 2006: **CNS tuberculosis: *M. tuberculosis* and the Blood-brain barrier.** Talk at the Department of Pediatric Infectious Diseases, Stony Brook University, Stony Brook, NY
13. Aug 2006: **Faculty Speaker.** 11th Annual Topics in Infectious Diseases for Primary Care, San Diego, CA
14. Jan 2007: **Faculty Speaker: Community-Acquired Methicillin-Resistant Staphylococcus aureus (CA-MRSA).** 4th Annual Anti-Infectives Partnering & Deal-Making Summit, San Francisco, CA
15. Feb 2007: **Faculty Speaker, Update: What is new in the treatment of tuberculosis?** American College of Physicians, Puerto Rico Chapter, San Juan, PR
16. Feb 2007: **Faculty Speaker, State of the art: The management of community acquired pneumonia.** American College of Physicians, Puerto Rico Chapter, San Juan, PR
17. May 2007: **Real-time *in vivo* imaging of *Mycobacterium tuberculosis* infection.** Center for Tuberculosis Research Annual Scientific Meeting, Baltimore, MD
18. Oct 2007: **TB diagnosis in young children and pregnant women in India.** Talk at the Department of Pediatrics, BJ Medical College, Pune, India
19. Feb 2008: **TB in children – the common and the not so common . . .** Talk at Sir Ganga Ram Hospital, New Delhi, India
20. Apr 2008: **Tuberculosis: What you need to know in 2008?** 36th Annual Pediatric Trends, Johns Hopkins University, Baltimore, MD
21. May 2008: **Real time *in vivo* imaging of TB disease.** Talk at Aeras Global TB Vaccine Foundation, Rockville, MD
22. Jun 2008: **Faculty Speaker, Tuberculosis: A Global perspective** at the Children's Center Corporate Recognition Luncheon, Baltimore, MD
23. Aug 2008: **Faculty Speaker, Tuberculosis Update 2008** at the Infant Foundation, Buenos Aires, Argentina
24. Oct 2008: **Grand rounds, Tuberculosis: A Global perspective** at the Department of Pediatrics, Johns Hopkins University, Baltimore, MD
25. Oct 2008: **Grand Rounds, Tuberculosis: Why we need to care?** at the Department of Pediatrics, St Agnes Hospital, Baltimore, MD

26. Oct 2008: **Faculty Speaker, Laboratory Diagnosis of TB** at the ICAAC/IDSA TB Workshop, Washington, DC
27. Oct 2008: **Faculty Speaker, Tuberculosis Update 2008** at the Fall Symposium in Pediatric Infectious Disease at Union Memorial Hospital, Department of Pediatrics, Union Memorial Hospital, Baltimore, MD
28. Nov 2008: **Grand Rounds, Tuberculosis: A Global Problem** at Sanford Children's, Sioux Falls, SD
29. Oct 2008: **ID Grand rounds, Tuberculosis: A Global perspective** at the Department of Pediatrics, Vanderbilt University, Nashville, TN
30. Mar 2009: **Real-time *in vivo* imaging of *Mycobacterium tuberculosis* infection** at the TB Drug Accelerator Meeting, Gates Foundation, Seattle, WA

CURRENT RESEARCH / FUNDING

Gates Foundation Global Health Program TB Drug Accelerator (PI: Sanjay Jain)
Annual direct costs, $433,979

Real-time *in vivo* imaging of *Mycobacterium tuberculosis* infection: The major goal of this project is to develop novel and validate existing imaging technologies for use as surrogate markers for response to anti-tuberculosis therapy. It is anticipated that technologies developed and validated through this proposal will reduce and refine the use of animals in future experimental protocols thereby reducing costs involved with pre-clinical evaluation of anti-tuberculosis regimens.

Aeras Global TB Vaccine Foundation (PI: Sanjay Jain)
Annual direct costs, $73,968

Evaluation of *M. tuberculosis* persistence genes as vaccine candidates: The major goals of this project are to evaluate the vaccine potential of 7 *M. tuberculosis* genes hypothesized to be involved in long-term survival of the bacteria in mammalian lungs.

Faculty Grant in Global Health Research (PI: Sanjay Jain)
Annual direct costs, $50,000

Diagnosis of active tuberculosis in HIV infected and uninfected young children in India: This project will build on an existing Indo-US collaboration with BJMC and KEM medical institutions in Pune, India. The goal of this project is evaluate the feasibility of two novel TB diagnostic tests (T-SPOT.TB and MODS) for the diagnosis of active TB in young children (including MDR-TB strains) in Pune, India.

NIH/NIAID N01-AI30036 (PI: William Bishai)
New animal models for tuberculosis: Pathogenesis of CNS tuberculosis – animal models, comparative animal models to study genetic requirements of *M. tuberculosis*, designer Arrays for Defined Mutant Analysis – Identification of *M. tuberculosis* genes required for survival in lungs and extra-pulmonary dissemination in the mouse aerosol model of tuberculosis and mycobacterial chemically inducible promoters for use in animal models.

NIH/NIAID R01 (PI: William Bishai)
The major goal of this project is to study the PK/PD of anti-TB drugs in rabbit TB cavities using necropsy and imaging in live animals.

NIH/NIAID R03 (PI: Sanjay Jain) (pending)
Annual direct costs, $50,000

The major goal of this project is to evaluate a novel ELISPOT assay for the diagnosis of active tuberculosis in HIV infected and uninfected young children in India.

CFAR Pilot Developmental Award (PI: Sanjay Jain) (Completed)

Annual direct costs, $42,000

Pathogenesis of CNS tuberculosis – *In vivo* model: The goal of this project is to identify *M. tuberculosis* gene requirements for invasion and survival in a novel *in vivo* murine model of CNS tuberculosis.

Clinician Scientist Award – JHU (PI: Sanjay Jain) (Completed)
Annual direct costs, $65,000

Pathogenesis of CNS tuberculosis – *In vitro* model: The goal of this project is to understand intra-cellular trafficking by *M. tuberculosis* in an *in vitro* Human brain microvascular endothelial cell model.