

CURRICULUM VITAE

William Ramses Bishai, MD, PhD

DEMOGRAPHIC INFORMATION

Current Appointments:

Associate Professor of Medicine, Division of Infectious Diseases
Johns Hopkins School of Medicine
Co-Director, Center for Tuberculosis Research
Johns Hopkins School of Medicine

Personal Data:

<i>Date of Birth:</i>	October 9, 1959
<i>Citizenship:</i>	American
<i>Marital Status:</i>	Married, 1989. 4 children born: 1993, '95, '97, '99.
<i>Home Address:</i>	<i>Business Address:</i>
1202 Ridervale Rd.	Center for Tuberculosis Research
Baltimore, MD 21204	Dept. of Medicine, Div. of Infectious Diseases
Tel: 410-938-8830	Johns Hopkins Sch. of Medicine
	424 N. Bond Street
	Baltimore, MD 21231
	Tel: 410-955-3507
	Fax: 410-614-8173
	E-mail: wbishai@jhsp.edu wbishai1@jhmi.edu

Education and Training:

B.A.	1981	Harvard College, Dept of Biochemistry
M.Phil.	1983	Cambridge University, Dept. of Pharmacology, Advisor: Dr. Leslie L. Iversen
M.D., Ph.D.	1989	Harvard Medical School, Dept. Micro. & Mol. Genetics Advisor: Dr. John R. Murphy
Internal Med. Residency	1989-91	Brigham and Women's Hospital Dept. Chief: Dr. Eugene Braunwald
Infectious Diseases Fellow	1991-94	Johns Hopkins Sch. of Medicine, Dept of Medicine Division Chief: Dr. John G. Bartlett

Howard Hughes Fellow	1992-94	Johns Hopkins Sch. of Medicine Dept. Mol. Biol. & Gen. Advisor: Dr. Hamilton O. Smith (Nobel laureate)
Medical Licensure	1991	Maryland
Diplomate Internal Med.	1992	American Board of Internal Medicine
Diplomate Infectious Dis.	1994	American Board of Internal Medicine

Professional Experience:

Assistant Professor of Molecular Microbiology and Immunology Johns Hopkins School of Hygiene and Public Health	10/94 – 9/98
Assistant Professor of International Health Johns Hopkins School of Hygiene and Public Health	10/98 – 11/99
Deputy Director, Center for Tuberculosis Research Johns Hopkins University	10/98 – 7/03
Associate Professor of International Health Johns Hopkins School of Hygiene and Public Health	11/99 – 6/01
Associate Professor of Medicine, Infectious Diseases Johns Hopkins School of Medicine	7/01 - present
Co-Director, Center for Tuberculosis Research Johns Hopkins University	8/03 – present

Affiliations:

Attending Physician Johns Hopkins AIDS clinic and Baltimore City Eastern Chest (Tuberculosis) Clinic	10/94 - present
Dept. of Medicine, Division of Infectious Diseases Johns Hopkins School of Medicine (2° appointment)	10/94 – 6/01
Dept. of Pathology (2° appointment) Johns Hopkins School of Medicine	7/98 -- present
Member, Program in Cellular Molecular Medicine (2° appointment) Johns Hopkins School of Medicine	7/97 - present
Dept. of Molecular Microbiology and Immunology Johns Hopkins School of Public Health (2° appointment)	10/98 – present
Dept. of International Health Johns Hopkins School of Public Health (2° appointment)	7/01 – present

RESEARCH ACTIVITIES

Publications:

Peer-reviewed scientific articles:

1. **Bishai WR**, Stoolmiller A. Uptake of diflubenzuron (N-[[4-chlorophenyl]amino]carbonyl]-2,6-difluorobenzamide) by rat C6 glial cells *in vitro*. Pesticide Biochem Physiol 1979;11:258-266
2. Murphy JR, **Bishai WR**, Borowski M, Miyanochara A, Boyd J, Nagle S. Genetic construction, expression, and melanoma-selective cytotoxicity of a diphtheria toxin-related alpha-melanocyte-stimulating hormone fusion protein. Proc Natl Acad Sci USA 1986; 83:8258-8262
3. **Bishai WR**, Miyanochara AR, Murphy JR. 1987. Cloning and expression in *Escherichia coli* of three fragments of diphtheria toxin truncated within fragment B. J Bacteriol 1987;169:1554-1563.
4. **Bishai WR**, Rappuoli R, Murphy JR. High-level expression of a proteolytically sensitive diphtheria toxin fragment in *Escherichia coli*. J Bacteriol 1987;169:5140-5151
5. Williams DP, Parker K, Bacha P, **Bishai WR**, Borowski M, Genbauffe F, Strom TB, Murphy JR. Diphtheria toxin receptor binding domain substitution with interleukin-2: genetic construction and properties of a diphtheria toxin-related interleukin-2 fusion protein. Protein Engineering 1987;1:493-498
6. Murphy JR, Williams DP, Bacha P, **Bishai WR**, Waters C, Strom TB. Cell receptor specific targeted toxins: genetic construction and characterization of an interleukin 2 diphtheria toxin-related fusion protein. J Recept Res 1988;8:467-480
7. Cha J, **Bishai WR**, Chandrasegaran S. New vectors for direct cloning of PCR products. Gene 1993;136:369-370
8. **Bishai WR**, Smith HO, Barcak GJ. A peroxide/ascorbate-inducible catalase from *Haemophilus influenzae* is homologous to the *Escherichia coli katE* gene product. J Bacteriol 1994;176:2914-2921
9. **Bishai WR**, Howard NS, Winkelstein JA, Smith HO. Characterization and virulence analysis of catalase mutants of *Haemophilus influenzae*. Infect Immun 1994;62:4855-4860
10. Howard NS, Gomez JE, Ko C, **Bishai WR**. Color selection with a hygromycin-resistance-based *Escherichia coli*-mycobacterial shuttle vector. Gene 1995;166:181-182
11. Calamita G, **Bishai WR**, Preston GM, Guggino WB, Agre P. Molecular cloning and characterization of aquaporin AqpZ, a water channel from *Escherichia coli*. J Biol Chem 1995; 270:29063-29066

12. DeMaio J, Zhang Y, Ko C, Young DB, **Bishai WR**. A stationary phase, stress-response sigma factor from *Mycobacterium tuberculosis*. Proc Natl Acad Sci USA 1996;93:2790-2794
13. **Bishai WR**, Graham NM, Harrington S, Page C, Moore-Rice K, Hooper N, Chaisson RE. Rifampin-resistant tuberculosis in a patient receiving rifabutin prophylaxis. N Engl J Med 1996;334:1573-6
14. Michele TM, Cronin WA, Graham NM, Dwyer DM, Pope DS, Harrington S, Chaisson RE, **Bishai WR**. Transmission of *Mycobacterium tuberculosis* by a fiberoptic bronchoscope: identification by DNA fingerprinting. JAMA 1997;278:1093-95
15. Calamita G, Kempf B, Rudd KE, Bonhivers M, Kneip S, **Bishai WR**, Bremer E, Agre P. The aquaporin-Z water channel gene of *Escherichia coli*: structure, organization and phylogeny. Biol Cell 1997;89: 321-329
16. Calamita G, Kempf B, Bonhivers M, **Bishai WR**, Bremer E, Agre P. Regulation of the *E. coli* water channel gene, *aqpZ*. Proc Natl Acad Sci USA 1998;95:3627-3631
17. DeMaio J, Zhang Y, Ko C, **Bishai WR**. *Mycobacterium tuberculosis sigF* is part of a gene cluster with similarities to the *Bacillus subtilis sigF* and *sigB* operons. Tuberc Lung Dis 1997; 78: 3-12.
18. Chen P, and **Bishai WR**. Novel selection for isoniazid (INH) resistance genes supports a role for NAD⁺-binding proteins in INH resistance in *Mycobacterium tuberculosis*. Infect Immun 1998; 66:5099-5106
19. **Bishai WR**, Graham NM, Harrington S, Pope DS, Hooper N, Astemborski J, Sheely L, Vlahov D, Glass GE, Chaisson RE. Molecular and geographic patterns of tuberculosis transmission after 15 years of directly observed therapy. JAMA 1998; 280:1679-1684
20. Miyazaki E, Miyazaki M, Chen JM, Chaisson RE, **Bishai WR**. Moxifloxacin (BAY 12-8039), a new 8-methoxyquinolone, is active in a mouse model of tuberculosis. Antimicrob Agents Chemother 1999; 43:85-89
21. Michele TM, Ko C, **Bishai WR**. Exposure to antibiotics induces expression of the *Mycobacterium tuberculosis sigF* gene: implications for chemotherapy against mycobacterial persistors. Antimicrob Agents Chemother 1999; 43:218-225
22. Kimura M, Converse PJ, Astemborski J, Rothel JS, Vlahov D, Comstock GW, Graham NM, Chaisson RE, **Bishai WR**. Comparison between a whole blood γ -interferon release assay and tuberculin skin testing for the detection of tuberculosis infection among patients at risk for TB exposure. J Infect Dis 1999;179:1297-1300

23. Head SR, Parikh K, Rogers YH, **Bishai WR**, Goelet P, Boyce-Jacino MT. Solid-phase sequence scanning for drug resistance detection in tuberculosis. *Mol Cell Probes* 1999;13: 81-7
24. Miyazaki E, Chen JM, Ko C, **Bishai WR**. The *Staphylococcus aureus* *rsbW* (*orf159*) gene encodes an anti-sigma factor of SigB. *J Bacteriol* 1999;181:2846-2851
25. **Bishai WR**, Dannenberg AM Jr, Parrish N, Ruiz R, Chen P, Zook BC, Johnson W, Boles JW, Pitt ML. Virulence of *Mycobacterium tuberculosis* CDC 1551 and H37Rv in rabbits evaluated by Lurie's pulmonary tubercle count method. *Infect Immun* 1999;67:4931-4934
26. Miyazaki E, Chaisson RE, **Bishai WR**. Analysis of rifapentine for preventive therapy in the Cornell mouse model of latent tuberculosis. *Antimicrob Agents Chemother* 1999;43: 2126-2130.
27. Sterling TR, Alwood K, Gachuhi R, Coggin W, Blazes D, **Bishai WR**, Chaisson RE. Relapse rates after short-course (6 month) treatment of TB in HIV-infected and uninfected persons. *AIDS* 1999;13:1899-904
28. Manabe YC, Saviola BJ, Sun L, Murphy JR, **Bishai WR**. Attenuation of virulence in *Mycobacterium tuberculosis* expressing a constitutively active iron repressor. *Proc Natl Acad Sci USA* 1999;96:12844-12848.
29. Manabe YC, Chen JM, Ko CG, Chen P, **Bishai WR**. Conditional sigma factor expression using the inducible acetamidase promoter reveals that the *Mycobacterium tuberculosis* *sigF* gene modulates the expression of the 16 kDa alpha-crystallin homologue. *J Bacteriol* 1999;181:7629-7633.
30. Sterling TR, Pope DS, **Bishai WR**, Harrington S, Gershon RR, Chaisson RE. Transmission of *Mycobacterium tuberculosis* from a cadaver to an embalmer. *New Engl J Med* 2000;342: 246-248.
31. Soliveri JA, Gomez J, **Bishai WR**, Chater KF. Multiple paralogous genes related to the *Streptomyces coelicolor* developmental regulatory gene *whiB* are present in *Streptomyces* and other actinomycetes. *Microbiology* 2000;146: 333-343
32. Ellingson JL, Stabel JR, **Bishai WR**, Frothingham R, Miller JM. Evaluation of the accuracy and reproducibility of a practical PCR panel assay for rapid detection and differentiation of *Mycobacterium avium* subspecies. *Mol Cell Probes* 2000;14: 153-61
33. Gomez J, **Bishai WR**. *whmD* is an essential mycobacterial gene required for proper septation and cell division. *Proc Natl Acad Sci USA* 2000;97: 8554-8559

34. Chen P, Ruiz R, Li Q, Silver R, **Bishai WR**. Construction and characterization of a *Mycobacterium tuberculosis* mutant lacking the alternate sigma factor gene, *sigF*. *Infect Immun* 2000;66: 5575-80
35. Sterling TR, Thompson D, Stanley RL, McElroy PD, Madison A, Moore K, Ridzon R, Harrington S, **Bishai WR**, Chaisson RE, Bur S. A multi-state outbreak of tuberculosis among members of a highly mobile social network: implications for tuberculosis elimination. *Int J Tuberc Lung Dis* 2000;4:1066-1073.
36. Dannenberg AM, **Bishai WR**, Parrish N, Ruiz R, Johnson W, Zook BC, Boles JW, Pitt LM. Efficacies of BCG and vole bacillus (*Mycobacterium microti*) vaccines in preventing clinically apparent pulmonary tuberculosis in rabbits: a preliminary report. *Vaccine* 2000;19:796-800.
37. Parrish NM, Kuhajda FP, Heine HS, **Bishai WR**, Dick JD. Antimycobacterial activity of cerulenin and its effects on lipid biosynthesis. *J Antimicrob Chemother* 1999; 43:219-226.
38. Wendel KA, Alwood KS, Gachuhi R, Chaisson RE, **Bishai WR**, Sterling TR. Paradoxical worsening of tuberculosis in HIV-infected persons. *Chest* 2001; 120: 193-197.
39. Cronin WA, Golub JE, Magder LS, Baruch NG, Lathan MJ, Mukasa LN, Hooper N, Razeq JH, Mulcahy D, Benjamin WH, **Bishai WR**. Epidemiologic usefulness of spoligotyping for secondary typing of *Mycobacterium tuberculosis* isolates with low copy numbers of IS6110. *J Clin Microbiol* 2001; 39: 3709-3711.
40. Mazurek GH, LoBue PA, Daley CL, Bernardo J, Lardizabal AA, **Bishai WR**, Iademarco M F, Rothel JS. Comparison of an interferon-gamma assay with tuberculin skin testing for detecting latent *Mycobacterium tuberculosis* infections. *JAMA* 2001; 286: 1740-1747
41. Golub JE, Cronin WA, Obasanjo OO, Coggin W, Moore K, Pope DS, Thompson D, Sterling TR, Harrington S, **Bishai WR**, Chaisson RE. Transmission of *Mycobacterium tuberculosis* through casual contact with an infectious case. *Arch Intern Med* 2001; 161: 2254-2258
42. Oursler KK, Moore RD, **Bishai WR**, Harrington SM, Pope DS, Chaisson RE. Survival of patients with pulmonary tuberculosis: clinical and molecular epidemiologic factors. *Clin Infect Dis* 2002; 34: 752-9.
43. Manabe YC, Scott CP, **Bishai WR**. Naturally attenuated, orally administered *Mycobacterium microti* as a tuberculosis vaccine is better than subcutaneous *M. bovis* BCG. *Infect Immun* 2002; 70: 1566-1570.
44. Bellete B, Coberly J, Link-Barnes G, Ko C, Chaisson RE, Comstock GW, **Bishai WR**. Evaluation of a whole-blood interferon- γ release assay for the detection of

- Mycobacterium tuberculosis* infection in 2 study populations. Clin Infect Dis 2002; 34: 1449-1456.
45. Yoshimatsu T, Nuermberger E, Tyagi S, **Bishai WR**, Grosset J. Bactericidal activity of increasing daily and weekly doses of moxifloxacin in murine tuberculosis. Antimicrob Agents Chemother 2002; 46: 1875-1879.
 46. Gounder C, De Queiroz Mello FC, Conde MB, **Bishai WR**, Kritski AL, Chaisson RE, Dorman SE. Field evaluation of a rapid immunochromatographic test for tuberculosis J Clin Microbiol 2002; 40: 1989-93.
 47. Kaushal D, Schroeder BG, Tyagi S, Yoshimatsu T, Scott C, Ko C, Mehrotra J, Carpenter L, Manabe YC, Fleischmann RD, **Bishai WR**. Distinction between bacterial survival and disease induction defined by an alternate sigma factor regulon of *Mycobacterium tuberculosis*. Proc Natl Acad Sci USA 2002; 99: 8330-8335
 48. **Bishai WR**. Current issues, treatment guidelines, and the appropriate use of fluoroquinolones for respiratory tract infections. Clinical Therapeutics 2002; 24: 838-50.
 49. Scott CP, Dos Anjos Filho L, De Queiroz Mello FC, Thornton CG, **Bishai WR**, Fonseca LS, Kritski AL, Chaisson RE, Manabe YC. Comparison of C(18)-carboxypropylbetaine and standard N-acetyl-L-cysteine-NaOH processing of respiratory specimens for increasing tuberculosis smear sensitivity in Brazil. J Clin Microbiol 2002; 40: 3219-22.
 50. Fleischmann RD, Alland D, Eisen JA, Carpenter L, White O, Peterson J, DeBoy R, Dodson R, Gwinn M, Haft D, Hickey E, Kolonay JF, Nelson WC, Umayan LA, Ermolaeva M, Salzberg SL, Delcher A, Utterback T, Weidman J, Khouri H, Gill Mikula, **Bishai WR**, Jacobs Jr. WR, Venter JC, Fraser CM. Whole-genome comparison of *Mycobacterium tuberculosis* clinical and laboratory strains. J Bacteriol 2002; 184: 5479-90.
 51. Cronin WA, Golub JE, Lathan MJ, Mukasa LN, Hooper N, Razeq JH, Baruch NG, Mulcahy D, Benjamin WH, Magder LS, Strickland GT, **Bishai WR**. Molecular epidemiology of tuberculosis in a low- to moderate-incidence state: are contact investigations enough? Emerg Infect Dis 2002; 8: 1271-9.
 52. Park WG, **Bishai WR**, Chaisson RE, Dorman SE. Performance of the microscopic observation drug susceptibility assay in drug susceptibility testing for *Mycobacterium tuberculosis*. J Clin Microbiol 2002; 40: 4750-2.
 53. Saviola B, Woolwine SC, **Bishai WR**. Isolation of acid induced genes of *Mycobacterium tuberculosis* using recombinase-based *in vivo* expression technology. Infect Immun 2003; 71: 1379-88.

54. Ando M, Manabe YC, Converse P, Miyazaki E, Ko C, Harrison R, Murphy JR, **Bishai W**. Characterization of the Role of the Divalent Metal Ion-Dependent Transcriptional Repressor MntR in the Virulence of *Staphylococcus aureus*. *Infect Immun* 2003; 71: 2584-90.
55. Lamichhane G, Zignol M, Blades NJ, Geiman DE, Dougherty A, Grosset J, Broman KW, **Bishai WR**. A postgenomic method for predicting essential genes at subsaturation levels of mutagenesis: application to *Mycobacterium tuberculosis*. *Proc Natl Acad Sci USA* 2003; 100: 7213-18.
56. Manabe YC, Dannenberg AM Jr, Tyagi SK, Hatem CL, Yoder M, Woolwine SC, Zook BC, Pitt ML, **Bishai WR**. Different strains of *Mycobacterium tuberculosis* cause various spectrums of disease in the rabbit model of tuberculosis. *Infect Immun*. 2003; 71: 6004-6011.
57. Ando M, Yoshimatsu T, Ko C, Converse PJ, **Bishai WR**. Deletion of *Mycobacterium tuberculosis* sigma factor E results in delayed time to death with bacterial persistence in lungs of aerosol-infected mice. *Infect Immun* 2003; 71: 7170-7172.
58. Ginsburg AS, Hooper N, Parrish N, Dooley KE, Dorman SE, Booth J, Diener-West M, Merz WG, **Bishai WR**, Sterling TR. Fluoroquinolone resistance in patients with newly diagnosed tuberculosis. *Clin Infect Dis* 2003; 37: 1448-52.
59. Ginsburg AS, Woolwine SC, Hooper N, Benjamin WH Jr, **Bishai WR**, Dorman SE, Sterling TR. The rapid development of fluoroquinolone resistance in *M. tuberculosis*. *N Engl J Med*. 2003; 349: 1977-8.
60. Geiman D, Kaushal D, Ko C, Tyagi S, Manabe YC, Schroeder BG, Fleischmann RD, Morrison NE, Converse PJ, Chen P, **Bishai WR**. Attenuation of late-stage disease in mice infected by the *Mycobacterium tuberculosis* mutant lacking the SigF alternate sigma factor and identification of SigF-dependent genes by microarray analysis. *Infect Immun* 2004; (in press).
61. Sun R, Converse P, Ko C, Tyagi S, Morrison NE, **Bishai WR**. *Mycobacterium tuberculosis* sigma factor *sigC* is required for lethality in mice and for the conditional expression of a defined gene set. *Mol Microbiol* 2004 (in press).
62. Dorman S, Dannenberg, AM Jr, Hatem CL, Tyagi S, Aird K, Zook BC, Pitt MLM, **Bishai WR**, Manabe YC. Susceptibility to tuberculosis: clues from studies with inbred and outbred New Zealand white rabbits. *Infect Immun* 2004; (in press).
63. Scott CP, Kumar N, Bishai WR, Manabe YC. *Plasmodium* infection modulates *Mycobacterium tuberculosis* infection in the murine model. *Am J Trop Med Hyg* 2004; (in press).

64. Saviola B, Bishai W. Method to integrate multiple plasmids in the mycobacterial chromosome. *Nucleic Acids Res* 2004; (in press).
65. Nettles RE, Mazo D, Alwood K, Gachuhi R, Maltas G, Wendel K, Cronin W, Hooper N, **Bishai W**, Sterling TR. Risk factors for relapse and acquired rifamycin resistance after directly observed tuberculosis treatment: a comparison by HIV serostatus and rifamycin. *Clin Infect Dis* 2004; (in press).
66. Nuermberger EL, Yoshimatsu T, Tyagi S, O'Brien RJ, Vernon AN, Chaisson RE, **Bishai WR**, Grosset JH. A fluoroquinolone-containing regimen dramatically shortens the time to sterilization in experimental tuberculosis. *Am Rev Respir Crit Care Med*. 2004 (in press).
67. Nuermberger EL, Yoshimatsu T, Williams K, Tyagi S, Bishai WR, Grosset JG. Paucibacillary tuberculosis in mice after prior aerosol immunization with BCG. *Infect Immun* 2004; (in press).
68. Nuermberger, EL, Helke K, Bishai WR. A low-dose aerosol model of pneumococcal pneumonia emulates human disease and is useful for evaluating antimicrobial efficacy. *Antimicrob Agents Chemother* 2004; (submitted)
69. Calamita H, Ko C, Tyagi S, Morrison NE, Bishai WR. The *Mycobacterium tuberculosis* SigD sigma factor controls the expression of ribosome-associated gene products in stationary phase and is required for full virulence. (submitted).
70. Karakousis PC, Yoshimatsu T, Lamichhane G, Nuermberger EL, Grosset J, Bishai WR. A physical containment, in vivo extracellular model of *Mycobacterium tuberculosis* infection shows characteristics of latency. (submitted)

Non-peer-reviewed articles:

1. Sandberg, B., J. Maggio, **W. R. Bishai**, and P. Hannah. 1983. A conformational approach to structure-activity studies of substance P, p. 18-19. *In* P. Skrabanek and D. Powell (ed.), *Substance P--Dublin 1983*. Boole Press, Dublin.
2. Jacobs W, Brennan P, Curlin G, Ginsberg A, Adams M, Fleischmann R, Fraser C, Venter JC, Shinnick T, **Bishai WR**, Smith H, Stover K, Hatfull G. Comparative sequencing. *Science* 1996; 274:17-18 (letter to the editor)
3. Gomez, J., J. Demaio, C. Ko, and **W. R. Bishai**. 1996. Sporulation regulatory gene homologues in *M. tuberculosis* and *M. leprae*. *In* Yamada, T. (ed.) Proceedings of the Thirty-First U.S.-Japan Tuberculosis and Leprosy Research Conference: Nagasaki, Japan, July 17-19, 1996. pp. 96-100.
4. Fleischmann, R. D., **W. R. Bishai**, I. M. Orme, J. T. Belisle, J. C. Venter. 1997. The *Mycobacterium tuberculosis* genome sequencing and analysis program. Proceedings of the Thirty-Second U.S.-Japan Tuberculosis and Leprosy Research Conf: Cleveland, Ohio, July 21-23, 1997. pp 7-11.
5. Gomez, J., B. Greenberg, K. Chater, **Bishai WR**. 1997. Identification of the *whm* family of genes in *M. tb.* and *M. leprae*: relationship to transcription factors required for sporulation in related bacteria. Proceedings of the Thirty-Second U.S.-Japan Tuberculosis and Leprosy Research Conference: Cleveland, Ohio, July 21-23, 1997. pp 12-16.
6. Chaisson RE, **Bishai WR**. No news is good news: opportunistic infections. *Hopkins HIV Rep* 1998;10:2,11
7. **Bishai WR**, Chaisson RE. Opportunistic infections: down but not out. *Hopkins HIV Rep* 1999;11:2,7,12
8. Chen, P., R. Ruiz, Q. Li, R. Silver, and **W. R. Bishai**. 1999. The *Mycobacterium tuberculosis* alternate sigma factor, SigF, controls late-stage bacterial virulence. Proceedings of the Thirty-Fourth U.S.-Japan Tuberculosis and Leprosy Research Conf: San Francisco, CA, June 28-30, 1999, pp. 197-201.
9. Manabe YC, Hatem CL, Murphy JR, **Bishai WR**. Identification of Iron-Regulated Genes in *Mycobacterium tuberculosis*. Proceedings from the US-Japan Leprosy and Tuberculosis Meeting, New Orleans, LA 2001
10. Randhawa GS, **Bishai WR**, Comstock GW. Analysis of data from individuals demonstrates high discordance between IFN-gamma assays and PPD-tuberculin skin tests used in screening for tuberculosis infection. *Int J Tuberc Lung Dis* 2002; 6: 89 (letter to the editor).

11. **Bishai WR.** A testament to sustained macrolide efficacy. Clin Infect Dis 2003; 36: 935-6 (letter to the editor).
12. Comstock GW, Bellete B, Ko C, Coberly J, Chaisson RE, **Bishai WR.** Whole blood interferon-g release assay versus the TST: newer not better. Clin Infect Dis 2003; 36: 1209-10 (letter to the editor).
13. Nuermberger EL, **Bishai WR.** Significance of macrolide resistance in *Streptococcus pneumoniae*. J Antimicrob Chemother. 2003; 52: 524-5 (letter to the editor).

Reviews, Editorials (non-invited)

1. **Bishai WR.** 1986. Magic bullets for melanoma. *The Harvard Review* 1986;1:83-103
2. Murphy JR, **Bishai WR**, Williams D, Bacha P, Borowski M, Parker K, Boyd J, Waters C, Strom TB. Genetic assembly and selective toxicity of diphtheria-toxin-related polypeptide hormone fusion proteins. *Biochem Soc Symp*1987; 53:9-23
3. Parrish NM, Dick JD, **Bishai WR.** Mechanisms of latency in *Mycobacterium tuberculosis*. *Trends Microbiol* 1998; 6:107-112
4. Gomez JE, Chen JM, **Bishai WR.** Sigma factors of *Mycobacterium tuberculosis*. *Tuber Lung Dis* 1997;78:175-183
5. Ginsburg AS, Grosset JH, **Bishai WR.** Fluoroquinolones, tuberculosis, and resistance. *The Lancet Infectious Diseases* 2003; 3: 432-42.
6. Nuermberger EL, **Bishai WR.** The clinical significance of macrolide-resistant *Streptococcus pneumoniae*: It's all relative. *Clin Infect Dis.* 2004;38: 99-103
7. Karakousis P, **Bishai WR**, Dorman SE. *Mycobacterium tuberculosis* cell envelope lipids and the host immune response. *Cellular Microbiol.* 2004; (in press).

Book Chapters, Monographs:

1. Miyanohara, A., **W. Bishai**, J. Boyd, S. Nagle, and J. Murphy. 1986. Genetic construction, expression, and melanoma-selective cytotoxicity of a diphtheria toxin-related melanocyte stimulating hormone fusion gene, p. 365-374. In P. Falmagne, J. E. Alouf, F. J. Fehrenbach, J. Jeljaszewicz, and M. Thelestam (ed.), *Bacterial Protein Toxins*, Gustav Fischer, Stuttgart.
2. Williams, D. P., P. Bacha, C. Waters, **W. Bishai**, K. Parker, T. B. Strom, and J. R. Murphy. 1988. Interleukin-2 receptor targeted toxicity: genetic construction and properties of a diphtheria toxin-related interleukin-2 fusion protein, p 401-410. In F. Fehrenbach, J. Alouf, P. Falmagne, W. Goebel, J. Jeljaszewicz, D. Jurgens, and R. Rappuoli (ed.), *Bacterial Protein Toxins*. Zbl. Bakt. Suppl. 17, Gustav Fischer, Stuttgart.
3. **Bishai, W. R.** and J. R. Murphy. 1988. Bacteriophage gene products that cause human disease, p. 683-724. In R. Calendar (ed.), *The Bacteriophages, Vol. 2*. Plenum Press, New York.
4. **Bishai, W.** 1989. Genetic construction, expression, and characterization of targeted diphtheria toxin fragments. Doctoral dissertation, Harvard University, Cambridge, MA.
5. **Bishai WR**, Sears CL. Food poisoning syndromes. *Gastroenterology Clin North Am* 1993;22:579-608.
6. DeMaio J, **Bishai WR**. Food poisoning syndromes. In J. T. LaMont (ed.), *Gastrointestinal Infections: Diagnosis and Management*. Marcel Dekker, New York. 1997; pp. 87-123
7. **Bishai, W. R.** and R. E. Chaisson. Short-course preventive therapy for tuberculosis. *Clin Chest Medicine* 1997;18:115-122.
8. Harrington, S. and **W. R. Bishai**. 2000. Molecular epidemiology and infectious diseases. Ch. 8. In K. Nelson, C. M. Williams, N. Graham (eds.) *Infectious Diseases Epidemiology*. Aspen Publishers, Inc., Gaithersburg, MD. pp. 205-230.
9. Chen P, Gomez J, **Bishai WR**. Mycobacterial transcription regulation in stationary phase. In G. Hatfull and W. R. Jacobs (ed.), *Mycobacterial Genetics*. ASM Press, Washington, DC. 2000; pp. 149-156 (review).
10. Saviola B, **Bishai WR**. The genus *Mycobacterium*-medical. Ch. 284. In M. Dworkin, S. Falkow, E. Rosenberg, K.-H. Schleifer, E. Stackebrandt (ed.), *The Prokaryotes: an Evolving Electronic Resource for the Microbiologic Community*. 3rd Ed. Springer Verlag, NY. 2000 (on line at <http://rizzo.springer-ny.com:6336/contents/>).

11. Randhawa GS, **Bishai WR**. Beneficial impact of genome projects on tuberculosis control. *Infect Dis Clinics North Am* 2002; 16: 145-161.
12. **Bishai WR**, and Nightingale C. The role of macrolides in the treatment of community acquired pneumonia. Ch. 4. *In Community Acquired Respiratory Tract Infections*. C. H. Nightingale, P. G. Ambrose and T. M. File Jr. (eds). Marcel Dekker, Inc., N.Y., 2003, pp. 59-74.
13. Nuermberger E, and **Bishai WR**. Management of community-acquired pneumonia caused by drug-resistant *Streptococcus pneumoniae*. *In "The Management of Multiple Drug Resistant Infections"*, Stephen H Gillespie (ed). Humana Press, Inc. 2003 (in press)
14. McMurray D, Cooper A, **Bishai WR**, Flynn J. Animal models of tuberculosis. *In "Tuberculosis"*, S Cole, K Eisenach, B Gicquel, W Jacobs Jr, D McMurray (eds). ASM Press, 2004, (in press).
15. Smith I, **Bishai WR**, and Nagaraja V. Regulation of mycobacterial transcription. *In "Tuberculosis"*, S Cole, K Eisenach, B Gicquel, W Jacobs Jr, D McMurray (eds). ASM Press, Washington DC, 2004, (in press).

Books

1. **Bishai, W.**, D. Hughes Hallett, T. Kaye, and J. Van Wye. 1982. *How to Prepare for the New Medical College Admission Test*. Harcourt Brace Jovanovich, New York.

Conference Abstracts:

> 50, Not listed

Other Media:

1. Manabe YC, **Bishai WR**. Tuberculosis Basic Science Module – WHO Website. 1999. Editor, Christy Hanson.
2. **Bishai W**. The new kid on the block: community-acquired pneumonia guidelines from the CDC. Feature article, www.hopkins-abxguide.org. Posted July 2000.
3. **Bishai W**. Disease specific breakpoints for the pneumococcus: do we have the right macrolide breakpoint? Feature article, www.hopkins-abxguide.org. Posted Sept 2000.
4. Nuermberger E, **Bishai W**, Chaisson RE. New developments in community-acquired pneumonia: controversy and consensus. Report on a satellite symposium held at the 39th Annual Meeting of the IDSA, San Francisco, CA, October 25, 2001. Feature article, www.hopkins-abxguide.org. Posted Nov 2001.
5. **Bishai W**. New community acquired pneumonia guidelines from the American Thoracic Society: consensus and controversy. Feature article, www.hopkins-abxguide.org. Posted Nov. 2001.
6. **Bishai W**. Comparative effectiveness of different macrolides: clarithromycin, azithromycin, and erythromycin. Feature article, www.hopkins-abxguide.org. Posted Dec. 2001.
7. **Bishai W**. Gram positive infections: a report on the First International Symposium on Resistant Gram-Positive Infections, San Antonio, TX, Dec. 3-5, 2000. Feature article, www.hopkins-abxguide.org. Posted Dec. 2001.
8. Nuermberger E, **Bishai W**. ICAAC in December: delayed but still dazzling – a report on the 41st Interscience Conference on Antimicrobial Agents and Chemotherapy, Chicago, IL, December 16-19, 2001. Feature article, www.hopkins-abxguide.org. Posted Jan. 2002.
9. **Bishai W**. Report on the 6th International Conference on the Macrolides, Azalides, Streptogramins, Ketolides & Oxazolidinones (ICMASKO), Bologna, Italy, January 22-25, 2002. Feature article, www.hopkins-abxguide.org. Posted Feb. 2002.
10. Nuermberger, E, Nicolau DP, **Bishai W**. Maximizing the probability of positive outcomes – a conference report from Infection 2002, Scottsdale, AZ, April 19-21, 2002. Feature article, www.hopkins-abxguide.org. Posted May 2002.

11. Yoder M, **Bishai W**. Olympic city hosts decathlon of pulmonary infectious disease – an updates from the ATS Conference, Atlanta, GA, May 18-22, 2002; Feature article, www.hopkins-abxguide.org. Posted June 2002
12. **Bishai W**. Antibiotics in Amsterdam: a report from the 22nd International Congress of Chemotherapy (ICC) Amsterdam, The Netherlands, June 30 - July 3, 2001. Feature article, www.hopkins-abxguide.org. Posted July 2002.
13. Ginsburg A, **Bishai W**. Antimicrobials, resistance, and bioterrorism: selected abstracts and presentations – a report from the 42nd ICAAC, San Diego, CA, September 27-30, 2002. Feature article, www.hopkins-abxguide.org. Posted Oct 2002.
14. **Bishai W**. Report on the IDSA Annual Meeting, San Francisco, CA, October 25-28 2001. Feature article, www.hopkins-abxguide.org. Posted Nov. 2002.
15. Karakousis P, **Bishai W**. Synopsis of Key Presentations at the 40th IDSA Annual Meeting, Chicago, IL, October 24, 2002. Feature article, www.hopkins-abxguide.org. Posted Nov 2002.
16. **Bishai W**. Report on the Infectious Diseases Society of America Meeting, San Francisco, CA, October 25-28, 2001. Feature article, www.hopkins-abxguide.org. Posted Nov 2001.
17. Karakousis P, **Bishai W**, Chaisson RE. Management of community-acquired pneumonia: improving patient outcomes--a satellite symposium preceding the 40th IDSA Annual Meeting, Chicago, IL, October 24, 2002. Feature article, www.hopkins-abxguide.org. Posted Dec 2002.
18. Nuermberger, E, Nicolau DP, **Bishai W**. Maximizing positive results in Las Vegas: report on the 2nd annual conference entitled "Infection: maximizing the probability of a positive outcomes". A conference report from Infection 2003, Las Vegas, NV, April 23-26, 2003. Feature article, www.hopkins-abxguide.org. Posted June 2003.
19. Yoder M, Nuermberger, E, **Bishai W**. Update from the ATS 2003 International Conference. A report from the American Thoracic Society International Conference 2003, Seattle, WA, May 17-21, 2003. Feature article, www.hopkins-abxguide.org. Posted July 2003
20. Nuermberger, E, Chaisson, RE, **Bishai W**. Highlights from the Eighth Annual Topics in Infectious Diseases for Primary Care. Report on the 8th annual conference entitled "Topics in Infectious Diseases" Santa Fe, NM Aug 10-13, 2003. Feature article, www.hopkins-abxguide.org. Posted Sept 2003.

Inventions, Patents, Copyrights:

1. DNA encoding stationary phase, stress response sigma factor from *Mycobacterium tuberculosis*. Inventors, **W. Bishai**, J. DeMaio, Y. Zhang, D. Young. US Patent No. 05700925. Issued Dec. 23, 1997
2. Regulation of a sigma factor from *Mycobacterium tuberculosis*. Inventors, **W. Bishai**, J. DeMaio. US Patent No. 05824546. Oct. 20, 1998
3. Method of identifying compounds that regulate the binding of M. tuberculosis SigF to the M. tuberculosis OrfX protein. Inventors, **W. Bishai**, J. DeMaio, Y. Zhang, D. Young. US Patent No. 06004764. Issued Dec. 21, 1999
4. WhmD, an essential cell division gene from Mycobacterium. Inventors, **W. Bishai**, J. Gomez. US Patent No. 06590087. Issued July 8, 2003.

EDUCATIONAL ACTIVITIES

Teaching:

Classroom Instruction:

Principles of Bacterial Pathogenesis; R. Markham director, BSPH, 1996-01, 3 lectures/yr
 Biological Basis of Infectious Diseases; G. Ketner director, 1997-present, 2 lectures/yr
 Introduction to Infectious Dis. (Montgom. Co.); Dept. of MMI, BSPH, 1997, 1 lecture
 Vaccines and Public Health; D. Burke director, BSPH, 1999-present, 1 lecture/yr
 Infectious Diseases Epidemiology; K Nelson director, BSPH, 1997-present, 1 lecture/yr
 Infectious Diseases and Child Survival, N. Halsey, BSPH, 1998-99, 1 lecture/yr
 Summer course in Infectious Diseases, R. Gilman, BSPH, 1997-01, 1 lecture/yr
 Summer course in Epidemiology, K Nelson, BSPH, 1997-present, 1 lecture/yr
 Microbiology Block; 2nd year class, SoM, P Lietman, 1996-98 1 lecture/yr,
 Topics in Pathobiology, SoM, G Pasternack, 2000-present 1 lecture/yr,
 Animal models of disease, SoM, C. Zink, 2001- present 1 lecture/yr,

Course Director

Biological Basis of Vaccine Development, SHPH 223.689, 4th term 1999-00 (co-directed, with Dr. David Schwartz)

Clinical Instruction

Attending, AIDS service, (Osler 8, Jefferson 3), 1998-present, 1 month/year

CME Instruction

JHU Infectious Dis. CME Course, Santa Fe, NM Aug 2003, Co-director with R. Chaisson
 Infection 2003, Las Vegas, NV April 2003 Co-organizer with D. Nicolau
 Infection 2002, Scottsdale, AZ April 2002 Co-organizer with D. Nicolau, G. Doern

Mentoring:

Advisees:

Post-doctoral Trainees (Current)

Ronggai Sun, PhD	Post-doctoral fellow	5/01 - present
Tetsuyuki Yoshimatsu, MD	Post-doctoral fellow	5/01 - present
Raghunand Tirumalai, PhD	Post-doctoral fellow	6/01 - present
Mark Yoder, MD	Post-doctoral fellow	7/01 - present
Heather Calamita, PhD	Post-doctoral fellow	1/02 - present
Petros Karakousis, MD	Post-doctoral fellow	8/02 - present
Sanjay K. Jain, MD	Post-doctoral fellow	9/02 - present
Moises Hernandez, PhD	Post-doctoral fellow	9/03 - present
Jong-Hee Lee, PhD	Post-doctoral fellow	9/03 - present

Post-doctoral Trainees (Past)

James DeMaio, MD	10/94 - 5/96
Currently private practice Infections Limited, Inc., Tacoma, WA	
Ping Chen, PhD	2/95 - 9/98
Currently Director of Microbiology Aeras (formerly Sequella) Global TB Foundation, Rockville, MD	
Theresa Michele, MD	9/95 - 10/98
Currently Director of Clinical Research Biotechnology General Corp. Iselin, NJ 08080	
Moriyo Kimura, MD, MPH	9/97 - 7/98
Currently Asst. to the Director (Dr. Mori) Japanese Anti-TB Association (JATA), Tokyo	
Eishi Miyazaki, MD, PhD	4/97 - 4/99
Currently Instructor in Pulmonary Medicine 3 rd Dept. of Internal Medicine Oita Medical University, Oita, Japan	
Miki Miyazaki, MD, PhD (part time fellow)	9/97 - 4/99
Currently private practice Oita Medical University, Oita, Japan	
Yukari Manabe, MD	7/97 - 6/99
Currently Assistant Professor of Medicine, JHU, Div. of Infectious Diseases, Johns Hopkins School of Medicine, Baltimore, MD	
Beatrice Saviola, PhD	9/97 - 2/01
Currently Asst. Prof. of Microbiology Western Univ., Pomona, CA	
Jyoti Mehrotra, PhD	8/99 - 2/01
Currently Post Doctoral Fellow, JHU Dept. of Oncology	
Masaru Ando, MD, PhD	3/99 - 6/01
Currently Instructor in Pulmonary Medicine 3 rd Dept. of Internal Medicine Oita Medical University, Oita, Japan	
Gurvaneet Randhawa, MBBS	6/01 - 3/02
Currently, Senior Service Fellow Agency for Healthcare Research and Quality (AHRQ)	
Deepak Kaushal, PhD	8/99 - 9/01
Currently, Director of Bioinformatics St. Jude Medical Center, Memphis, TN	
Samuel Woolwine, PhD	7/00 - 6/03
Currently, Research Associate JHU Center for TB Research	
Amy Ginsburg, MD	7/02 - 6/03

Currently, Clinical Infectious Diseases Fellow
 Univ. of Colorado, Denver
 Eric Nuermberger, MD 7/01 – 6/03
 Currently, Assistant Prof. of Medicine
 JHU, Division of Infectious Diseases

Pre-doctoral Trainees (Current):

Cherise Scott Intl Health, PhD candidate (co-advised) 7/99 – present
 Gyanu Lamichhane CMM, PhD candidate 3/00 - present

Pre-doctoral Trainees (Past):

James Gomez PhD, Dept of MMI 10/94 – 6/99
 Currently Post-doctoral fellow, Microbiology & Immunology
 The Rockefeller University, NY, NY, Dr. John McKinney
 Jong-Min Chen, MD PhD candidate no degree, Dept of MMI 9/95 – 8/99
 Currently staff physician, Dept of Pediatrics
 National Taiwan University, Taipei
 Nikki Parrish (co-advised) PhD, Dept of MMI 9/95 – 3/99
 Currently Instructor, Dept. of Pathology, JHU
 Bahrie Ballette PhD, Dept of MMI 7/97 – 1/01
 Currently, Assistant Professor
 School of Medicine, Addis Ababa University

Master's and Bachelor's Trainees:

Benjamin Greenberg BA, MHS '97 (now MD, Baylor) 6/96 - 5/97
 Chris Page BA '95 (now MD, SUNY Stony Brook) 9/94 - 12/95
 Nathan Howard BA '95 (now MD, NY Med. College) 6/93 - 6/95
 Mariana Gonzalez ScM (now at USAMRIID, Frederick, MD) 9/95 - 5/97
 Jennifer Couget ScM (now research technician, industry) 9/95 - 10/96
 Caryn Good ScM candidate 1/97 – 1/98
 Sangeeta Karle MHS (now research tech. Baylor U.) 9/97 – 6/98
 Huiming Hon BA '99 (MD-PhD candidate Emory 9/99) 9/98 – 6/99
 Rafael Ruiz ScM 1/97 – 6/99
 Sandeep Tyagi Fogarty Traineeship 5/00 - present

Short Term Trainees

Maranibia Cardoso Oelemann, from Rio de Janeiro 9/00-12/00
 Suvarna Joshi, MMBS, from Mumbai, India 8/00-11/00

Thesis Committees

Preliminary PhD Oral Participation

Patricia Sheen, International Health
 Jonathan Golub, Epidemiology

Nicola Buckley, CMM
 James Gomez, MMI
 Nikki Parrish, MMI
 Jong-Min Chen, MMI
 Aimee Marson, MMI
 Stacey Wooden, MMI
 Amit Golding, CMM

Final Oral Participation

Chulso Moon, MD	PhD Dept. of Biol. Chem.	3/96
Maria Patricia Arbelaez Montoya, MD	PhD Dept. of Epidemiol.	9/96
Thomas Ng	PhD Dept. of Biology	10/96
Michelle Gwinn (reader)	PhD Dept. Mol. Biol. and Gen.	4/97
Mary Durmowicz	PhD Dept. of Biology	4/98
Nikki Parrish	PhD Dept. of MMI	4/99
James Gomez	PhD Dept. of MMI	6/99
Bahrie Bellele	PhD Dept of MMI	1/01

Thesis Reader

Hanako Yamauchi	MHS, Dept. of MMI	6/96
Mary Mei-Ying Chen	ScM, Dept of MMI	5/00
Thomas Ulrich	ScM, Dept of MMI	5/00
Celine Gounder	ScM, Dept of Epidemiology	5/00

Editorial Activities:

Editorial Board Appointments

Section Editor (Pathogenesis), *Tubercle and Lung Disease*, 1997 to 2002
 Infection and Immunity, 2001-present

Peer Reviewer for

Science, Nature, PNAS, New England Journal of Medicine, JAMA, The Lancet, Annals of Internal Medicine, Nature Genetics, Nature Medicine, Journal of Bacteriology, Infection and Immunity, Gene, Gastroenterology, Journal of Immunology, Journal of Infectious Diseases, Clinical Diagnostic & Laboratory Immunology, International Journal of Tuberculosis and Lung Disease, Molecular Microbiology, Cellular Microbiology, Molecular and Cellular Probes, and Emerging Infectious Diseases

CLINICAL ACTIVITIES

Certification:

Medical Licensure in Maryland.	1991	
Diplomate Internal Medicine	1992	American Board of Internal Medicine
Diplomate Infectious Diseases	1994	American Board of Internal Medicine

Service Responsibilities:

AIDS service inpatient attending (Osler 8, Jeff 3):	1 month/yr	1998-present
JHH AIDS (Moore) clinic attending:	2 mornings/month	1994 - 2003
JHH AIDS (Moore) clinic physician:	2 mornings/month	1994 - present
Balto. City Eastern Chest (TB) clinic attending:	2 mornings/month	1994 - 2001

ORGANIZATIONAL ACTIVITIES

Institutional Administrative Appointments

MMI Admissions Committee '94 - '98
Animal Care and Use Committee, BSPH 1997 - 2000
Infectious Diseases Fellowship Committee, 2002 - present

Professional Societies

American Society for Microbiology (ASM)
American Thoracic Society
Infectious Diseases Society of America
International Union Against Tuberculosis and Lung Disease
Maryland Chapter of ASM
American Society for Clinical Investigation

Conference Organizer

Organizer of Joint MMI-ID Thursday noon weekly seminar series. 1996 - 98
Co-Organizer of TB interest group. 1995 to present
Organizer & Participant: *Princeton Project 55* TB Symposium, BSPH, November 1, 1997
Chair-elect and Chairman, Program Committee for Assembly on Microbiology,
Tuberculosis and Pulmonary Infections, American Thoracic Society, 2001-03
JHU Infectious Dis. CME Course, Santa Fe, NM Aug 2003, Co-director with R. Chaisson
Infection 2002, Scottsdale, AZ April 2002 Co-organizer with D. Nicolau, G. Doern
Infection 2003, Las Vegas, NV April 2003 Co-organizer with D. Nicolau

Session Chair

Symposium Co-Chair, 1997 ATS Ann. Mtg.: "Tuberculosis: the Year in Review"
 Symposium Co-Chair, 1998 ATS Ann. Mtg.: "From Diagnostics to Therapeutics: Clinical Implications of Basic Research in Respiratory Infections"
 Symposium Co-Chair, 1999ATS Ann. Mtg.: "TB: Demystifying the Mycobacterium"
 Session Chair, 2000 ASM TB Conference. "Gene regulation and latency"
 Symposium Co-Chair, 2002 ATS Ann. Mtg.: "Bioterrorism and Lung Health"
 Session Chair, 2003 Keystone Tuberculosis Mtg.: "Gene Regulation in M. tb."
 Symposium Co-Chair, 2003 ATS Ann. Mtg.: "Inhaled Agents of Bioterrorism"
 Post graduate course Co-Chair, ATS-ALA 2003 Ann. Mtg.: "Antimicrobial agents in respiratory illness--beyond bactericidal"

Advisory Committee and Review Groups

Program Committee for Assembly on Microbiology, Tuberculosis and Pulmonary Infections, American Thoracic Society,	1996 - 2003
Member of Executive Committee, Assembly on Microbiology, Tuberculosis and Pulmonary Infections, American Thoracic Society,	1999 - present
Data Safety Monitoring Board, Tuberculosis Res. Unit Study. TBRU Protocol #8	2002- present
Member, NIH Bacteriology -Mycology – 1 Study Section	1999 - 2003
Chair, NIH Bacteriology- Mycology-1 Special Emphasis Panel Bethesda, MD	Feb 2003
CME Advisory Committee, US Micron	2003-present
Panelist. A scientific workshop targeting persistence in tuberculosis: determining the state of the science to shorten treatment. Global Alliance for TB Drug Development Albuquerque, NM	Jan 2003
Panelist. Improved methods for preclinical evaluation of Antimicrobials for tuberculosis NIH, Tuberculosis Research Unit (CWRU), Sequella Global Tuberculosis Foundation Bethesda, MD	May 2002
Panelist. Longer acting rifamycins workshop NIH and Global Alliance for TB Drug Development Bethesda, MD	Apr 2002
Panelist. Role of Fluoroquinolones in the treatment of tuberculosis NIH and Global Alliance for TB Drug Development Bethesda, MD	Apr 2001
Scientific Advisory Board, NIH Tuberculosis Research Unit Case Western Res. Univ.	2000 - 2002
Gates Foundation, External <i>Ad hoc</i> Reviewer for TB Portfolio, Seattle, WA	Oct 2001

Ad hoc site visit reviewer for a NIH General Clinical Research Center, NCRR, 4/96
Ad hoc reviewer for NIH Bacteriology- Mycology – 1 Study Section 6/96, 6/97, 10/97
Ad hoc reviewer for NIH Special Emphasis Panel Study Section, NCDDG-OI/NIAID, 6/99
Ad hoc reviewer for NIH Special Emphasis Panel Study Section, NHLBI, 7/99
Special Teleconference Reviewer, NIH 4/97, 4/98
Special Reviewer, NIH NIAID Tuberculosis Research Unit Project 7/97, 6/98
Panelist, USDA Nat. Res. Initiative Coop. Grants Program (NRICGP) 6/98
Ad hoc reviewer, USDA Nat.. Res. Initiative Coop. Grants Program (NRICGP), 4/97, 4/99
Ad hoc reviewer, VA Medical Research Service, 9/97, 4/98, 3/99
NIH, NIAID External Advisory Panel, Bethesda, MD 1998
“Crohn’s Disease – Is there a microbial etiology?”
American Public Health Association, Washington, DC 1999
Expert Panelist, “Adherence with HIV Therapy.”
NIH, NIAID External Advisory Panel. “*M. tb.* genomic sequencing,” 5/96.

Society Memberships:

American Society for Microbiology (ASM)
American Thoracic Society
Infectious Diseases Society of America
International Union Against Tuberculosis and Lung Disease
Maryland Chapter of ASM
American Society for Clinical Investigation

Consultantships

Merck, Advisory Board, HIV antiviral therapy, July 2000
Merlin Technologies, Consultant on TB therapy, Boston, MA, April 2001
Advanced Microbial Solutions, Consultant, Novel Antibiotic Devel., Boston, Nov 2001
Baxter, Consultant on TB therapy, Chicago, IL Jan 2002
Abbott, Advisory Board, Respiratory Antibiotics, Bologna, Italy, Jan 2002
Aventis, Advisory Board, Respiratory Antibiotics, Seattle WA, Oct 2002
Pfizer, Advisory Board, Respiratory Antibiotics, New York Feb 2003

RECOGNITION

Awards, Honors

Phi Beta Kappa, Junior year, Harvard College, 1980.
B.A. degree, *summa cum laude*, Harvard College, 1981.
Recipient of Fulbright Full Grant for one year of study in the United Kingdom, 1981-82.
Fully funded MD-PhD student, Harvard Medical School, 1982-89.
Recipient, competitive Howard Hughes Postdoct. Res. Fellowship for Physicians, 1992-94.

Joseph Bates Young Investigator Award, Am. Lung Assoc./American Thoracic Society, 1997.
American Society for Clinical Investigation, Member 2002

Invited Reviews, Editorials

1. **Bishai WR.** Huber the Tuber goes molecular. Book review of *Tuberculosis*, T. Shinnick (ed.) Springer-Verlag, New York, 1996. *Trends Microbiol* 1997; 5:209 (book review).
2. **Bishai WR.** From the laboratory: The red snapper, a latency chameleon? *TB Notes* 1997; 3: 8-10.
3. **Bishai WR.** The *Mycobacterium tuberculosis* genomic sequence: anatomy of a master adaptor. *Trends Microbiol* 1998; 6:464-465.
4. **Bishai WR.** 1999. Out of Africa: Daunting Data and Dazzling Discussion on TB. Book review of *Genetics and Tuberculosis Novartis Foundation Symposium 217* D.B. Young (ed.). John Wiley and Sons, New York, 1998. *Trends Microbiol.* 7:424 (book review).
5. **Bishai WR,** Chaisson RE. Drug resistance and the treatment of upper respiratory infections. *Am J Managed Care* 1999;5:S943-S954.
6. **Bishai WR,** Brueggemann AB, Nicolau DP, Steinberg I, Spiritus E, Tanigawa C, Koenig S, Chaisson RE, Browne BA, Yoder DM. Roundtable discussion. Optimizing the use of antimicrobial therapy. *Am J Manag Care.* 2000; 6:S1222-35.
7. **Bishai WR.** Is drug resistance affecting treatment outcomes? *Am J Manag Care.* 2000; 6:S1197-201.
8. Manabe YM, Dannenberg AD Jr., **Bishai WR.** What we can learn from the *Mycobacterium tuberculosis* genome sequencing projects. *Intl J Tuberc Lung Dis* 2000; 4: S1-S6.
9. **Bishai WR.** Rekindling old controversy on elusive lair of latent tuberculosis. *Lancet* 2000;356: 2113-2114 (commentary).
10. **Bishai WR.** Lipid lunch for persistent pathogen. *Nature* 2000; 406: 683-5 (commentary).
11. Manabe YC, **Bishai WR.** Latent *Mycobacterium tuberculosis* -persistence, patience, and winning by waiting. *Nat Med* 2000; 6:1327-1329.
12. Mehrotra J, **Bishai WR.** Regulation of virulence genes in *Mycobacterium tuberculosis*. *Int J Med Microbiol* 2001; 291: 171-182.
13. Wagner KR, **Bishai WR.** Issues in the treatment of *Mycobacterium tuberculosis* in patients with human immunodeficiency virus infection. *AIDS* 2001; 15 suppl.5:S203-12

14. **Bishai WR.** Tuberculosis transmission -- rogue pathogen or rogue patient? *Am J Respir Crit Care Med* 2001;164: 1104-05
15. **Bishai WR.** The in vivo-in vitro paradox in pneumococcal respiratory tract infections. *J Antimicrob Chemother* 2002;49:433-436
16. Woolwine S, **Bishai WR.** Mycobacterial Genetics: The sensibility of antisense. *Am J Respir Crit Care Med* 2002; 165: 318-319
17. **Bishai WR.** Issues in the management of bacterial sinusitis. *Otolaryngol Head Neck Surg* 2002;127(6 Suppl):S3-9.
18. Yoder M, Lamichhane G, **Bishai WR.** Cavitory tuberculosis: the holy grail of disease transmission. *Current Sci* 2004; 86: 101-108.
19. Nuermberger EL, **Bishai WR.** Antibiotic resistance in *Streptococcus pneumoniae*: what does the future hold? *Clin Infect Dis* 2004 (in press).