

LEONID HEIFETS

**Professor, Department of Medicine, National Jewish
Kramer Foundation Professor in Clinical Mycobacteriology,
Professor of Microbiology and Medicine (Pulmonology), Medical School**

EDUCATIONAL HISTORY:

- 1947 Moscow Medical Institute, Moscow, USSR (Undergraduate School)
Diploma with Honors: Medical Doctor
- 1953 Moscow Medical Institute, Moscow, USSR (Graduate School), Degree:
Candidate of Medical Sciences (Ph.D.)
- 1972 Academy of Medical Sciences, Moscow, USSR, Degree: Doctor of Medical
Sciences (equivalent to the British Degree of Sc.D.)

PROFESSIONAL EXPERIENCE:

- 1948 - 50 Graduate Student of the Dept. of Microbiology and Epidemiology of Moscow
Medical Institute, Moscow, USSR.
- 1950 - 54 Assistant Professor, Department of Microbiology of the Arkhangelsk Medical
Institute.
- 1954 - 57 Associate Professor, Department of Infectious Disease of Arkhangelsk Medical
Institute, USSR (in charge of the course of Epidemiology)
- 1957 - 69 Head of the Laboratory for Study of Efficacy of Bacterial Preparations: Moscow
Mechnikov Institute for Vaccines and Sera, Moscow. Coordinated research
projects on the control field (clinical) trials of vaccines, in collaboration with the
W.H.O. Supervised work teams of 20 workers (4 M.D.s, 5 Ph.D.s, Technicians).
Traveled widely in the Republics of Central Asia to collect and coordinate data.
In 1961 and 1962, served as Epidemiologist on Expedition to Congo (Zaire) to
organize control measures for malaria, leprosy and tuberculosis.
- 1969 - 78 Senior Researcher at the Department of Microbiology of the Central Research
Institute for Tuberculosis, Moscow, USSR. Supervised Graduate Students' work
(candidates for Ph.D. in Biology and Medicine). Principal investigator for
research project involving microbiological diagnosis of tuberculosis and
intracellular cultivation of mycobacteria.

- 1979 - 80 Research Fellow, Department of Medicine, National Jewish, Denver, CO. Research on the mechanisms of bactericidal function of the macrophages.
- 1980 - 86 Assistant Professor, Department of Medicine, University of Colorado Health Sciences Center, Denver, CO
- 1984 - 86 Assistant Professor, Dept. of Microbiology and Immunology, University of Colorado School of Medicine, Denver, CO
- 1986 - 92 Associate Professor, Dept. of Microbiology, Department of Medicine, University of Colorado School of Medicine, Denver, CO
- 1993 - pres. Professor, Department of Microbiology, and Department of Medicine (Pulmonology) University of Colorado School of Medicine
- 1980 - pres. Director, Mycobacteriology Laboratory, National Jewish Medical and Research Center, Denver, CO
- 1991 - pres. Senior Faculty Member (professor), National Jewish Center, Denver, CO
- 2000- pres. Kramer Foundation Professor in Clinical Mycobacteriology

PROFESSIONAL AFFILIATIONS:

- 1968 - 72 World Health Organization, Geneva, Switzerland. Member of W.H.O. Advisory Panel on Bacterial Diseases (invited by General Director of W.H.O.). Participated in development of the methodology for double-blind randomized trials. Took part in collective research with international medical specialists, organized a number of controlled trials with different vaccines. Delivered papers for the 11th, 12th and 14th Congresses of International Association for Biological Standardization.
- 1970 - 73 Invited Lecturer for International Courses on Epidemiology (under W.H.O.).
- 1980 - pres. Member, American Society for Microbiology
- 1986 - pres. Member, International Working Group on Mycobacterial Taxonomy (IWGMT)
- 1986 - pres. Member, International Union Against Tuberculosis (IUATLD)
- 1987-1991 Corresponding Member, Committee on Bacteriology and Immunology, IUATLD
- 1991- pres. Member, Committee on Bacteriology and Immunology, IUAT
- 1995 - pres. Member, Board of Directors, American Society for Tuberculosis Education and Research (ASTER)

1998 – pres. Member, American Thoracic Society

PROFESSIONAL SERVICE AND COMMITTEES:

A. Institutional

Clinical Laboratory Management Council

B. National (Review and Referee Work)

Mycobacteriology Referee, College of American Pathologists

Associate Editor, Intern.J.Tuberc.Lung Dis.

Reviewer, Antimicrob. Agents Chemother.

Reviewer, Journal of Clinical Microbiology

Reviewer, American Journal of Respiratory and Critical Care Medicine

Reviewer, European Journal of Clinical Microbiology

Reviewer, Chest

TEACHING EXPERIENCE

1. Participation in courses on tuberculosis at National Jewish Center, since 1983, two to three times a year.
2. Training of the Fellows from University of Colorado Health Sciences Center, 3-4 students per year; training of students from Medical Technology School, 4-5 students per year; training of the visiting technologists from other mycobacteriology laboratories.
3. Teaching microbiology at the Department of Microbiology, University of Colorado Health Sciences Center, since 1983, one semester, medical students, graduate microbiology students

GRANT SUPPORT:

- 2001 – 04 Private funding (Lane) “Evaluation of activity of new antimicrobial agents against *M.avium* in vitro. P.I.-L.Heifets. Total cost : \$100,000
- 2002 – 05 Molecular analyses of microbes in chronic bowel disease. NIH # RO1 AI1298 (P.I. N. Pace – Colo Univ, Boulder). Subcontract : P.I.-L.Heifets. \$62,000 annually
- 2003 - 06 Nanoparticles as a delivery system for anti-tuberculosis drugs. NIH: R21- AI-055284, P.I. – Heifets, Total cost \$850,601
- 2001 – 02 New class of anti-TB aminomethylene amids, NIH Grant AI 48437. P.I.-L.Heifets, total cost \$ 260,900.
- 1996 - 01 Preclinical Development of new treatment regimens against tuberculosis. NIH Program Grant consisted of 4 individual projects and one Scientific Core. Total

- \$2.78 million. The Program is completed (Final Report is submitted on November 29, 2001). P.I. – L.Heifets
- 1998 – 01 Development of drug-susceptibility tests in the MGIT system, compared with other culture media. Grant from Becton Dickinson. P.I. – L.Heifets. Total cost \$94,505.
- 1997 - 00 Effectiveness of Clarithromycin in Treatment of Disseminated *M. avium* Infection in AIDS Patients: Quantitation of Bacteriemia and Changes in MICs during the Course of Therapy. Principal Investigator: L. Heifets
- 1997 - 00 Evaluation of the Bacteriological Response of AIDS Patients with Disseminated *M. avium* Infection to Rifabutin vs. Rifampin. Grant from Adria Laboratories, remaining direct cost at March 1,00 was \$130,670. The Project is finished, and the residual has been distributed. Principal Investigator: L. Heifets
- 1995 - 00 Bacteriological response in patients treated with rifapentine, P.I. – L.Heifets. Grant from Hoechst Marion Roussel, total cost \$503,000, remaining direct cost at Jan.1, 1999 was \$17,226. The project is completed in March, 2000.
- 1993 - 96 Preclinical development of drugs against tuberculosis. Group Grant from NIH Direct cost \$829,508
- 1992 - 95 Bacteriological response in patients treated with ofloxacin (l-ofloxacin). Grant from NIH: Central TB Laboratory. Total Direct Cost: \$337,031
- 1987 - 92 The Development and Evaluation of Drugs for Treatment of *M. avium-intracellulare* Infections
NIH #NO1-AI-72636 Principal Investigator: M.D. Iseman
Principal Investigator for Phase II (*in vitro* studies): L. Heifets
Direct Cost for Phase II: \$465,959
- 1984 - 87 Development and Evaluation of Drugs for Treatment of *M. avium-intracellulare* Infection in AIDS and other Patients
NIH #NO1-AI-42544 Principal Investigator: M.D. Iseman
Principal Investigator for Phase II: *In vitro* Studies: L. Heifets
Direct Cost for Phase II: \$114,658
- 1981 - 84 Peroxidase in Macrophage Function
NIH A1-1709
Co-Principal Investigator L.Heifets
Principal Investigator: M. Goren
Total Direct Cost: \$280, 184
- 1981 - 82 Rapid Detection and Identification of *M. tuberculosis*
CDC #RFP 200-80-0518

Co-Principal Investigator L.Heifets
Principal Investigator: J.K. McClatchy
Direct Cost: \$40,000

PUBLICATIONS:**Main Russian Publications (1965-1977)**

1. Theoretical and methodical basis for evaluation of the effectiveness of immunization against infectious diseases, Monograph, 1968, Moscow, Medizina, p. 355.
2. Immunoelectrophoretic analysis of the antigenic composition of typhoid vaccines with established efficacy, Zh. Mikrobiol. (Moscow), 1969, 1, 40-46.
3. Main features of an epidemic due to the spread of typhoid and paratyphoid B infections via the water of an irrigation system, Higiena and Sanit., 1969, 2, 8-11.
4. Clinical symptoms of typhoid fever in vaccinated persons (according to the data strictly controlled field trials), Sov. Meditsina, 1969, 3, 21-25.
5. Comparative assessment of immunological efficacy of DPTS-vaccines with various quantitative content of components in primary immunization of children, Zh. Mikrobiol., 1970, 4, 134-140.
6. Protective activity of various antigenic complexes of typhoid vaccines and prospects of improvement of chemical vaccines, Zh. Mikrobiol., 1970, 5, 89-96.
7. Immunological reaction in children with general reaction of different intensity in response to immunization with typhoid vaccines, Zh. Mikrobiol., 1970, 6: 22-28.
8. Electron microscopic study of phagocytosis of mycobacteria, Zh. Mikrobiol., 1971, 7, 113-117.
9. A method for determination of the ingestive capacity of macrophages obtained from experimental animals and man in relation to Mycobacterium tuberculosis, Zh. Mikrobiol., 1972, 32-43.
10. A method for the separation of human blood cells in a mixture of verographin and ficoll, Laboratornoje delo, 1973, 10, 570-81.
11. Adsorbive activity of macrophages with respect to Mycobacterium tuberculosis, Probl. Tuberc. (Moscow), 1974, 10, 3-7.
12. Determination of intracellular activity of M. tuberculosis in a cell culture, Probl. Tuberc., 1974, 8, 79-83.
13. Reproduction dynamics as an index of intracellular activity of bacteria (in a model of M. tuberculosis), Zh. Mikrobiol., 1974, 10, 3-7.
14. Some problems of theory and practice in the field of immunization against infectious diseases (a review) Zh. Mikrobiol., 1973, 6, 148-153.

15. Peroral enteric vaccines (a review), Zh. Mikrobiol., 1974, 3, 21-28.
16. Controlled trials in medicine (a review), Clin. Meditsina (Moscow), 1974, 5, 22-28.
17. Use of regression analysis in quantitative assessment of the activity of biological preparations, Zh. Mikrobiol., 1975, 8, 96-102.
18. Controlled field trials to evaluate the potency of intracutaneous BCG vaccines (a review), Vestnik Akademii Med. Nauk, 1975, 4, 11-22.
19. The effect of cycloserin and terisidon on the intracellular multiplication of M. tuberculosis, Probl. Tuberc., 1975, 1, 71-73.
20. Quantitative estimation of intracellular multiplication of M. tuberculosis in presence of antibacterial drugs, Antibiotiki (Moscow), 1975, 11, 1006-1011.
21. Intracellular activity and phagocytability of freshly isolated strains as pathogenicity parameters of M. tuberculosis, Zh. Mikrobiol., 1977, 3, 74-78.
22. Intracellular activity of M. tuberculosis in patients with pulmonary tuberculosis undergoing chemotherapy, Probl. Tuberc., 1977, 2, 71-75.
23. The role of activated macrophages in the immune response during diseases with intracellular parasitism (a review), Zh. Mikrobiol., 1977, 10, 16-23.

Main Publications in English (1965-1977) from the USSR

24. Results of the study of typhoid vaccines in four controlled fields trails in the USSR, Bull. Wrld. Hlth. Org., 1965, 32, 1-14.
25. Controlled field trial and laboratory study of five typhoid vaccines in the the USSR, Ibid, 1966, 34, 321-339.
26. Controlled field trials of paratyphoid B vaccines and evaluation of the effectiveness of a single administration of typhoid vaccine, Ibid., 1968, 38, 907-915.
27. A controlled field trial to evaluate the protective capacity of a single dose of acetone-killed agar-grown and heat-killed broth-grown typhoid vaccines, Ibid., 1969, 40, 903-907.
28. Controlled field trial with dried sorbed paratyphoid B and typhoid vaccines, Ibid., 1971, 45, 787-794.

29. Controlled field trials of killed oral typhoid and paratyphoid B vaccines and cell-free chemical aerosol typhoid vaccine (Proc. 14th Congr. Intern. Ass. Biol. Standard., Douglas, Isle of Man), Developments in biol. stand., Basel e.a. (Karger), 1976, 33, 93-97.
30. Protective capacity of the typhoid and paratyphoid B and typhoid aerosol chemical vaccines in controlled field trials, J. Hyg. Epidemiol. Microbiol. Immunol. (Prague), 1976, 20, 292-299.
31. Laboratory characteristics of paratyphoid B vaccines tested in controlled field trials, J. Bact. (USA), 1969, 98, 502-510.
32. The protective activity of various antigen complexes of typhoid and paratyphoid B vaccines (Proc. 11th Congr. Perm. Sect. Microbiol. Stand., Int. Ass. Microbiol. Soc., Milan, 1970), Progr. Immunobiol. Stand., 1970, 4, 561-570.
33. Further studies of protective activity of antigen complexes of typhoid and paratyphoid B vaccines (Proc. 12th Int. Congr. Perm. Sect. Annecy), Prog. Immunobiol. Stand., 1972, 5, 389-393.
34. Duration of postvaccination antityphoid immunity according to the results of strictly controlled filed trials, J. Hyg. Epidemiol. Microbiol. Immunol. (Prague), 1969, 13, 154-165.
35. Postvaccination anti-typhoid immunity after primary immunization and revaccination according to the results of controlled field trials, Ibid., 1969, 13, 389-400.
36. The number of injections in primary immunization and postvaccination immunity to typhoid and paratyphoid B, Ibid., 1971, 15, 163-172.
37. Size of the immunizing dose and postvaccination immunity to typhoid and paratyphoid...., Ibid., 1971, 15, 173-182.
38. On the negative phase of post vaccination immunity to typhoid from results of epidemiological studied, Ibid., 1971, 15, 393-401.
39. Increased intracellular growth activity of tubercle bacilli excreted during treatment. The Lancet, 1977, 8034, 409-410.

Interruption in 1978 due to emigration from the USSR

PUBLICATIONS: since 1980 (in Denver)

Peer Reviewed Publications

40. Heifets, K Imai, M. Goren. Expression of Peroxidase-Dependent Iodination by Macrophages Ingesting Neutrophil Debris. J. Reticuloendothelial Soc., 1980, 28:391-404.

41. Heifets. Synergistic Effect of Rifampin, Streptomycin, Ethionamide, and Ethambutol on Mycobacterium intracellulare. Amer. Rev. Resp. Dis. 1982, 125:43-48.
42. Roberts, N. Goodman, L. Heifets, H. Larsh, et al. Evaluation of the BACTEC Radiometric Method of Recovery of Mycobacteria and Drug Susceptibility Testing of Mycobacterium tuberculosis from Acid-Fast Smear-Positive Specimens. J. Clin. Microbiol., 1983, 18, 589-696.
43. Heifets, L.B., Iseman, M.D., Cook, J.L., Lindholm-Levy, P.J., Drupa, I. Determination of in vitro susceptibility of Mycobacterium tuberculosis to cephalosporiins by radiometric and conventional methods. Antimicrobial Agents and Chemotherapy, (1985) 27:11-15.
44. Heifets, L.B., Iseman, M.D. Radiometric method of testing susceptibility of mycobacteria to pyrazinamide in 7H12 broth. J. Clin. Microbiology, (1985) 21:200-204.
45. Heifets, L.B., Iseman, M.D. Determination of in vitro susceptibility of mycobacteria to ansamycin. Amer. Rev. Resp. Dis. (1985) 132:710-711.
46. Perumal, W.R., Gangadharam, P., Heifets, L.B., Iseman, M.D. Dynamic aspects of the in vitro chemotherapeutic activity of ansamycin on M. intracellulare. Amer. Rev. Resp. Dis. (1985) 132:1278-1290.

47. Heifets, L.B., Iseman, M.D., Lindholm-Levy, P.J., Kanas, W. Determination of ansamycin minimal inhibitory concentrations for M. avium comp. in liquid medium by radiometric and conventional methods. Antimicrobial Agents and Chemotherapy, (1985) 28:570-5.
48. Heifets, L.B., Iseman, M.D., Lindholm-Levy, P.J. Rifabutine (ansamycin LM427) bacteriostatic and bactericidal effect against M. avium clinical isolates. Mycobacteria of Clinical Interest, (Ed. M. Casal) Excerpta Medica, Amsterdam-New York-Oxford, 1986, 180-183.
49. Heifets, L.B., Iseman, M.D., Crowle, A.J., Lindholm-Levy, P.J. Pyrazinamide is not active in vitro against M. avium complex. Am. Rev. Resp. Dis., 1986, 134:1287-1288.
50. Heifets, L.B., Iseman, M.D., Lindholm-Levy, P.J. Ethambutol MICs and MBCs for M. avium complex and M. tuberculosis. Antimicrob. Agents Chemother. , 1986, 30:927-932.
51. Horsburgh, C.R., Mason, U.G., Heifets, L.B. et al. Response to pulmonary M. avium intracellulare infection correlates with results of in vitro susceptibility testing. Am. Rev. Resp. Dis., 1987, 135:418-421.
52. Heifets, L.B., Iseman, M.D., Lindholm-Levy, P.J. Determination of MICs of conventional and experimental drugs in liquid medium by the radiometric method against M. avium complex. Drugs Under Experimental and Clinical Research, 1987, 13(9):529-538.
53. Lee, C.N. and Heifets, L.B. Determination of Minimal Inhibitory Concentrations of antituberculosis drugs. Amer. Rev. Resp. Dis., 1987, 136:349-352.
54. Heifets, L.B. and Lindholm-Levy, P.J. Bacteriostatic and bactericidal activities of ciprofloxacin and ofloxacin against M. tuberculosis and M. avium. Tubercle, 1987, 68(4):267-276.
55. Heifets, L.B. Iseman, M.D., Lindholm-Levy, P.J. Combinations of rifampin or rifabutine plus ethambutol against M. avium complex: bactericidal synergistic, and bacteriostatic additive or synergistic effects. Amer. Rev. Respir. Dis. 1988, 137:711-715.
56. Heifets, L.B., Lindholm-Levy, P.J., Iseman, M.D. Rifabutine: Minimal Inhibitory and Bactericidal Concentrations for M. tuberculosis. Amer. Rev. Respir. Dis. 1988, 137:719-721.
57. Salfinger, M., Stool, E.W., Piot, D., Heifets, L. Comparison of three methods for recovery of M. avium complex from blood specimens. J. Clin. Microbiol. 1988, 26:1225-1226.
58. Kononov, Y., Kim, D.T. Heifets, L. Effect of Egg Yolk on Growth of M. tuberculosis in 7H12 liquid medium. J. Clin Microbiol. 1988, 26:1395-1397

59. Salfinger, M. and Heifets, L.B. Determination of pyrazinamide MICs for Mycobacterium tuberculosis at different pHs by the radiometric method. *Antimicrob. Agents Chemother.* 1988, 32:1002-1004.
60. Heifets, L. MIC as a quantitative measurement of the susceptibility of Mycobacterium avium strains to seven antituberculosis drugs. *Antimicrob. Agents Chemother.* 1988, 32:1131-1136.
61. Lindholm-Levy, P.J. and Heifets, L. Clofazimine and other rimino-compounds: Minimal Inhibitory and Bactericidal Concentrations at different pHs for M. avium complex. *Tubercle*, 1988, 69:179-186.
62. Suo, J., Chang C.E., Lin, T.P., Heifets, L.B. Minimal Inhibitory Concentrations of isoniazid, rifampin, ethambutol, and streptomycin against M. tuberculosis strains isolated before treatment in Taiwan. *Amer. Rev. Resp. Dis.* 1988, 138:99-101.
63. Heifets, L.B., Flory, M.A., Lindholm-Levy, P.J. Does pyrazinoic acid as an active moiety or pyrazinamide have specific antimicrobial activity against M. tuberculosis? *Antimicrob. Agent Chemother.* 1989, 33:1252-1254.
64. Chen, Ch.H., Shih, J.F., Lindholm-Levy, P.J., Heifets, L.B., Minimal inhibitory concentrations of rifabutin, ciprofloxacin and ofloxacin against M. tuberculosis strains isolated before treatment of patients in Taiwan. *Amer. Rev. Respir. Dis.* 1989, 140:987-989
65. Heifets, L.B. and Lindholm-Levy, P.J. Comparison of bactericidal activity of streptomycin, amikacin, kanamycin, and capreomycin against M. avium and M. tuberculosis. *Antimicrob. Agents Chemother.* 1989, 33:1298-1301.
66. Heifets, L.B. and Lindholm-Levy, P.J. Is pyrazinamide bactericidal against M. tuberculosis? *Amer. Rev. Resp. Dis.* 1990, 141:250-252.
67. Heifets, L.B., Lindholm-Levy, P.J., Flory, M.A. Bactericidal activity *in vitro* of various rifamycins against M. avium and M. tuberculosis. *Amer. Rev. Respir. Dis.* 1990, 141:626-630.
68. Heifets, L.B., Lindholm-Levy, P.J., Flory, M.A. MICs and MBCs of Win 57273 against M. tuberculosis and M. avium. *Antimicrob. Agents Chemother.* 1990, 34:770-774.
69. Heifets, L.B., Lindholm-Levy, P.J., Flory, M. Thiacetazone *in vitro* activity against M. avium and M. tuberculosis. *Tubercle*, 1990, 71, 287-291.
70. Heifets, L.B., Lindholm-Levy, P.J., Flory, M. Comparison of bacteriostatic and bactericidal activity of isoniazid and ethionamide against M. avium and M. tuberculosis. *Am. Rev. Respir. Dis.*, 1991, 143, 268-270.

71. Isenberg, H.D., D'Amato, R.F., Heifets, L., et al. Collaborative feasibility study of biphasic media system (Roche Septi-Check AFB) for the rapid detection and isolation of mycobacteria. *J. Clin. Microbiol.*, 1991, 29:1719-1722.
72. Heifets, L.B., Lindholm-Levy, P.J. Comstock, R.D. Clarithromycin minimal inhibitory and bactericidal concentrations against *M. avium*. *Amer. Rev. Respir. Dis.*, 1992, 145:856-859.
73. Heifets, L. and Lindholm-Levy, P. Pyrazinamide sterilizing activity *in vitro* against semi-dormant *M. tuberculosis* bacterial populations. *Amer. Rev. Respir. Dis.*, 1992, 145, May issue.
74. Heifets L.B., Lindholm-Levy, P.J., Comstock, R.D. Bacteriostatic and bactericidal activities of gentamycin alone and in combination with clarithromycin against *M. avium*. *Antimicrob. Agents Chemother.* 1992, 36:1695-1697.
75. Mor, N. and Heifets, L. MICs and MBCs of clarithromycin against *M. avium* within human macrophages. *Antimicrob. Agents Chemother.* 1993, 37:111-114.
76. Mor, N. and Heifets, L. Inhibition of growth of *M. avium* by one pulsed exposure of infected macrophages to clarithromycin. *Antimicrob. Agents Chemother.* 1993, 37:1380-1382.
77. Siddiqi, S.H., Heifets, L., Cynamon, M.H. et al. Rapid broth microdilution method for determination of MICs for *M. avium* isolates. *J. Clin. Microbiol.* 1993, 31:2332-2338.
78. Heifets, L., Mor, N., Vanderkolk, J. *Mycobacterium avium* strains resistant to clarithromycin and azithromycin. *Antimicrob. Agents Chemother.* 1993, 37:2364-2370.
79. Chaisson, R.E., Benson, C.A., Dube, M.P., Heifets, L., Korvick, J.A., Elkin, S., Smith, T., Craft, C., Sattler, F.R. and AIDS Clinical Trial Group Protocol 157 Study Team. Clarithromycin therapy for *M. avium* complex disease (a randomized, double-blind, dose ranging study of patients with AIDS). *Ann Intern. Med.* 1994, 121:905-911.
80. Mor, N., Vanderkolk, J., and Heifets, L. Accumulation of clarithromycin in macrophages infected with *M. avium*. *Pharmacotherapy*, 1994, 14(1):100-104.
81. Mor, N., Vanderkolk, J. Heifets, L. Inhibitory and bactericidal activities of levofloxacin against *M. tuberculosis in vitro* and in human macrophages. *Antimicrob. Agents Chemother.* 1994, 1161-1164.
82. Heifets, L.B. Quantitative cultures and drug susceptibility testing of *M. avium* clinical isolates before and during the antimicrobial therapy. 11th Forum in Microbiology. Research in Microbiology (Inst. Pasteur), Paris, 1994, 145:188-196.

83. Sanchez, T., Vanderkolk, J., Seay, S. and Heifets, L. Quantitation of mycobacteria in blood specimens from patients with AIDS. *Tubercle and Lung Disease*, 1994, 75:386-390.
84. Mor, N., Vanderkolk, J., Mezo, N. Heifets, L. Effects of clarithromycin and rifabutin alone and in combination on intracellular and extracellular replication of *M. avium* . *Antimicrob. Agents Chemother.* 1994, 38:2738-2742.
85. Chen, C-H., Suo, J., Goble, Heifets, L. Quantitative measurement of drug susceptibility of *Mycobacterium tuberculosis* for monitoring chemotherapy response. *J. Formos Med. Assoc.*, 1994, 93:35-39.
86. Mor, N., Simon, B., and Heifets, L. Methods for determining concentrations of antimicrobial agents in human macrophages. *J. Chemother.*, 1995,7(3):1-3.
87. Mor, N., Simon, B., Mezo, N., and Heifets, L. Comparison of the activities of rifapentine and rifampin against *M. tuberculosis* residing in human macrophages. *Antimicrob. Agents Chemother.* 1995, 39:2073-2077.
88. Simon, B., Mor, N., Heifets, L. Bacteriostatic and bactericidal activity of benzoxazinorifamycin KRM-1648 against *M. tuberculosis* in human macrophages. *Antimicrob. Agents Chemother.*, 1996, 40:1482-1485.

89. Pierce, M., Crampton, S. Henry, D., **Heifets, L.**, LaMarca, A. Montecalvo, M., Wormser, G.P., Jablonski, H., Jamsek, J., Cynamon, M. Yangco, B.G., Notario, G. Craft, C. Randomized multicenter clinical trial of clarithromycin as prophylaxis for disseminated *M. avium* complex infection in patients with advanced AIDS. *N. Engl. J. Med.* 1996, 335:384-391.
90. Meier, A., **Heifets, L.**, Wallace, R.J., Zhang, Y., Brown, B.A., Sander, P., Böttger, E.C. Molecular mechanisms of clarithromycin resistance in *M. avium*: observation of multiple 23S r-DNA mutations in a clonal population. *J. Infect. Dis.* 1996, 174:356-360
91. Scorpio, A., Lindholm-Levy, P., **Heifets, L.**, Gilman, R., Siddiqi, S., Cynamon, M., Zhang, Y. Characterization of *pncA* mutation in pyrazinamide-resistant *M. tuberculosis*. *Antimicrob. Agents Chemother.*, 1997, 41:540-543.
92. Hafner, R., Cohn, J.A., Wright, D.J., Dunlap, N.E., Egorin, M.J., Enama, M.E, Muth, K., Peloquin, C.A., Mor, N., **Heifets, L.B.**, and the Datri 008 Study Group. Early bactericidal activity of isoniazid in pulmonary tuberculosis. *Am. J.Respir. Crit. Care Med.*, 1997, 156:918-923.
93. Perlman, D.C., El Sadr, W.M., **Heifets, L.B.**, Nelson, E.T., Matts, J.P., Chirgwin, K., Salomon, N., Telzak, E.E., Klein, O., Kreiswirth, B.N., Musser, J.M., Hafner, R., for the Community Programs for Clinical Research on AIDS 019 and the AIDS Clinical Trial Group 222 Protocol Team. Susceptibility to levofloxacin of *Mycobacterium tuberculosis* isolates from patients with HIV-related tuberculosis and characterization of a strain with levofloxacin monoresistance. *AIDS*, 1997, 11:1473-1478.
94. Oldfield, E.C., Fessel, W.J., Dunne, M.W., Dickinson, G., Wallace, M.R., Byrne, W., Chung, R., Wagner, K.F., Paparello, S.F., Craig, D.B., Melcher, G., Zajdowicz, M., Williams, R., Kelly, J.W., Zelasky, M., Berman, J.D., and **Heifets, L.B.** Once weekly azithromycin therapy for prevention of *M. avium* complex infection in patients with AIDS: a randomized, double-blind, placebo-controlled multicenter trial. *Clin. Inf. Dis.*, 1998, 26:611-619.
95. Williams, D., Spring, L., Collins, L., Miller, L., **Heifets, L.B.**, Gangadharam, P., Gillis, T.P. Contributions of *rpoB* mutations to the development of rifamycins cross-resistance in *M. tuberculosis*. *Antimicrob. Agents Chemother.*, 1998, 42:1853-1857.
96. Ward, T.T., Rimland, D. Kauffman, Huycke, M., Evans, T.G., **Heifets, L.** Randomized open-label trial of azithromycin plus ethambutol vs clarithromycin plus ethambutol therapy of *M. avium* complex bacteremia in patients with HIV infection. *Clin. Inf. Dis.*, 1998, 27:1278-1285.
97. Higginbotham ML, Lindholm-Levy PJ, **Heifets LB.** Susceptibilities of *Mycobacterium malmoense* determined at the growth optimum pH (pH 6.0). *Int J Tuberc Lung Dis* 2:430-434, 1998.

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2. In vitro susceptibility of M. tuberculosis to ceforanide and other cephalosporins. 84th ASM Annual Meeting. St. Louis, Missouri. 1984 (Abstract U-22).
3. Digestive processing of soluble and particulate substances by macrophages inhibited in lysosome-phagosome fusion with polyanionics (presented by Dr. M. Goren). 84th ASM Annual Meeting. St. Louis, Missouri. 1984 (Abstract D-36).
4. In vitro susceptibility of mycobacteria to ansamycin (Abstract U-59), (presented by P. Levy). 85th ASM Annual Meeting. Las Vegas, Nevada. 1985.
5. Radiometric method of testing susceptibility of mycobacteria to pyrazinamide (Abstract U-53). 85th ASM Annual Meeting. Las Vegas, Nevada. 1985.
6. Mycobacteriology: Who, What and How? Convenor, 87th ASM Annual Meeting. Atlanta, Georgia. 1987.
7. Minimal Inhibitory Concentrations vs critical concentrations in drug susceptibility testing. 87th ASM Annual Meeting. Atlanta, Georgia. 1987.

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9. Determination of pyrazinamide MICs by radiometric method (presented by M. Salfinger). 87th ASM Annual Meeting. Atlanta, Georgia. 1987.
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11. MICs and MBCs of clofazimine and other rimino-compounds for M. avium (presented by P. Lindholm-Levy). 88th ASM Annual Meeting. Miami Beach, Florida, 1988.
12. Conventional and radiometric methodology in primary isolation and identification of M. tuberculosis. A lecture. 88th ASM Annual Meeting. Miami Beach, Florida, 1988.
13. Dilemmas in drug susceptibility testing. Seminar. 89th Annual ASM Meeting, New Orleans, 1989.
14. Bactericidal activity of various rifamycins. 89th Annual ASM Meeting, New Orleans, 1989.
15. Bactericidal and bacteriostatic activity of WIN 57273 against *M. avium*. 90th ASM Annual Meeting, Anaheim, CA, Abstract U-59.
16. MICs and MBCs of isoniazid and ethionamide for *M. avium* and *M. tuberculosis*. 90th ASM Annual Meeting, Anaheim, CA Abstract U-60.
17. Mycobacteria in clinical microbiology: dogma and realities (symposium). Convenor, Seminar "Bactericidal and bacteriostatic activity of antimicrobial agents singly and in combination against *M. avium*". 90th ASM Annual Meeting, Ahaheim, CA.
18. Reappearance of tuberculosis. Seminar. 91st ASM Annual Meeting, Dallas, TX.
19. *In vitro* activity of the newer antimicrobial agents against *M. avium*. Seminar. 91st ASM Annual Meeting, Dallas, TX.
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21. Clarithromycin and temafloxacin: combined effect with other agents against *M. avium in vitro* . 31st ICAAC, 1992, Chicago, IL, Abstract 676.
22. Response to therapy of *M. avium* complex (MAC) infection in AIDS: correlates with *in vitro* susceptibility testing. 31st ICAAC, 1991, Chicago, IL, Abstract 671 (presented by C.R. Horsburgh).
23. Bactericidal activity of the combination of quinollones and clofazimine against *M. avium*. 92nd ASM Annual Meeting, New Orleans, LA 1992.

24. Accumulation of clarithromycin in macrophages. Poster (presented by N. Mor). 93rd ASM Annual Meeting. Atlanta, GA 1993.
25. Role of the Laboratory Services in Control of Tuberculosis (lecture). ATS Meeting, Chicago, May 1998.
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Presentations at International Meetings

1. Application of Rapid Methods (BACTEC system) in Mycobacteriology (Research): advantages and disadvantages. 9th Conference on the Genus Mycobacterium of the IWGMT. Sept. 3-7, 1985, Pavia, Italy.
2. Bacteriostatic and Bactericidal effect of Rifabutine. International Symposium on Mycobacteria of Clinical Interest. Sept. 27-28, 1985, Cordoba, Spain.
3. MICs of conventional and experimental drugs against M. avium complex. 7th Intern. Conf. on Future Trends in Chemotherapy. May 28-30, 1986, Pisa, Italy.
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