REFERENCES

1. Murray, P.R., Kobayashi, G.S., Pfaller, M.A., Rosenthal, K.S. 1994. *Mycobacterium.* Medical Microbiology. p. 320.
2. Bloom, B.R., Murray, C.J.L. 1992. Tuberculosis: Commentary on a Reemergent killer. Science; 257: 1055-64.
3. World Health Organization. 1995. Bridging the gaps: the world health report. Geneva: The Organization.
4. World Health Organization report on TB epidemic. 1997. Global TB programme. Geneva: The Organization.
5. Barnes, P., Blotch, A.B., Davidson, B.I., Snyder, Jr. D.E. 1991. Tuberculosis in patients with immuno-deficiency virus infection. N Engl J Med; 324: 1644-50.
6. Snider, D.E. Jr., Roper, W.L. 1992. The new tuberculosis. N Engl J Med; 326: 703-5.
7. Freiden, T.E., Sterling, T., Pablos-Mendez, A., Kilburn, J.O., Cauthen, J.O., Dooley, S.W. 1993. The emergence of drug-resistant tuberculosis in New York city. N Engl J Med; 328: 521-6.
8. Nosocomial transmission of multi-drug resistant tuberculosis among human immuno-deficiency virus infected patients Florida and New York, 1988-1991. MMWR Morb Mortal Wkly Rep 1991; 40: 585-91.
9. Dooley, S.W., Jarvis, W.R., Martone, W.J., Snyder, D.E. Jr. 1992. Multi-Drug resistant tuberculosis [editorial]. Ann Intern Med; 117: 257-8.

10. Edlin, B.R., Tokers, J.I., Greeko, M.H., Crawford, J.T., Williams, J., Sordillo, E.M., et al. 1992. An outbreak of multi-drug resistant tuberculosis among hospitalized patients with the Acquired Immuno-Deficiency syndrome. N Engl J Med; 326: 1514-21.

11. Pearson, M.L., Jareb, J.A., Freiden, T.R., Crawford, J.T., Davis, B.J., Dovley, S.N., et al. 1992. Nosocomial transmission of multi-drug resistant tuberculosis a risk to patients and health care workers. Ann Intern Med; 117: 191-6.

12. Takiff, H.E., et al. 1994. Cloning and Nucleotide Sequence of *Mycobacterium tuberculosis gyr*A and *gyr*B Genes and Detection of Quinolone Resistance Mutations. Antimicrob Agents Chemother; 38: 773-80.

13. Janknegt, R. 1986. Fluorinated quinolones. A review of their mode of action, antimicrobial activity, pharmacokinetics and clinical efficacy. Pharm Weekbl; 8: 1-12.

14. Wolfson, J.S., Hooper, D.C. 1985. The fluoroquinolones: structures, mechanisms of action and resistance, and spectra of activity in vitro. Antimicrob Agents Chemother; 28: 581-586.

15. Leysen, D.C., Haemers, A., Pattyn, S.R. 1989. Mycobacteria and the New Quinolones. Antimicrob Agents Chemother; 33: 1-5.

16. Sanders, C.S., Sanders, W.E. Jr., Goering, R.V. 1987. Overview of preclinical studies with ciprofloxacin. Am J Med; 82 (Suppl.4A): 2-11.

17. Easmon, C.S.F., Crane, J.P. 1985. Uptake of ciprofloxacin by human neutrophils. J Antimicrob Chemother; 16: 67-73.

18. Easmon, C.S.F., Crane, J.P., Blowers, A. 1986. Effect of ciprofloxacin on intracellular organisms: in vitro and in-vivo studies. J Antimicrob Chemother; 188 (Suppl.D): 43-48.

19. Tsukamura, M., Nakamura, E., Yoshii, S., Amano, H. 1985. Therapeutic effect of a new antibacterial substance ofloxacin (DL8280) on pulmonary tuberculosis. Am Rev Respir Dis; 131: 352-6.

20. Hong Kong Chest Service, British Medical Research Council. A controlled study of rifabutin and an uncontrolled study of ofloxacin in the retreatment of patients with pulmonary tuberculosis resistant to isoniazid, streptomycin and rifampicin. 1992. Tuber Lung Dis; 73: 59-67.

21. Cambau, E., et al. 1994. Selection of a *gyr*A Mutant of *Mycobacterium tuberculosis* Resistant to Fluoroquinolones during Treatment with Ofloxacin. J Inf Dis; 170: 479-83.

22. Canetti, G. 1965. The J. Burns Amberson lecture. Present aspects of bacterial resistance in tuberculosis. Am Rev Respir Dis; 92: 687-703.

23. Cockerill III, F.R., et al. 1995. Rapid Identification of a Point Mutation of the *M. tuberculosis* Catalase-Peroxidase (*Kat*G) Gene Associated with Isoniazid Resistance. J Inf Dis; 171: 240-5.

24. Cole, S.T., Honore, N. 1994. Streptomycin Resistance in Mycobacteria. Antimicrob Agents Chemother; 38: 238-42.

25. Goswitz, J.J., et al. 1992. Detection of *gyr*A gene mutations associated with ciprofloxacin resistance in methicillin resistant *S. aureus* : analysis by polymerase chain reaction and direct DNA sequencing. Antimicrob Agents Chemother; 36: 1166-69.

26. Oram, M., Fisher, L.M. 1991. 4-Quinolone resistance mutations in the DNA gyrase of *E. coli* clinical isolates identified using the polymerase chain reaction. Antimicrob Agents Chemother; 35: 387-89.

27. Sreedharan, S., et al. 1990. DNA gyrase *gyr*A mutations in ciprofloxacin resistant strains of *S. aureus* : close similarity with quinolone resistant mutations in *E. coli*. J Bacteriol; 172: 7260-62.

28. Wang, Y., Huang, W.M., Taylor, D.E. 1993. Cloning and nucleotide sequence of the *Campylobacter jejuni gyr*A gene and characterization of quinolone resistance mutations. Antimicrob Agents Chemother; 37: 457-63.

29. Alangaden, G.J., et al. 1995. Characterization of Fluoroquinolone-Resistant Mutant Strains of *M. tuberculosis* Selected in the Laboratory and Isolated from Patients. Antimicrob Agents Chemother; 39: 1700-03.

30. Cullen, M.El, et al. 1989. Cloning and characterization of a DNA gyrase A gene from *E. coli* that confers clinical resistance to 4-quinolones. Antimicrob Agents Chemother; 33: 886-94.

31. Heisig, P., Schedletzky, H., Falkenstein-Paul, H. 1993. Mutations in the *gyr*A gene of a highly fluoroquinolone-resistant clinical isolate of *E. coli*. Antimicrob Agents Chemother; 37: 696-701.

32. Tenover, F.C., Popovic, T., Olsvik, ϕ. Genetic Methods for Detecting Antibacterial Resistance Genes. In : Manual of Clinical Microbiology. ASM Press. Washigton, DC.

33. Edlin, B.R., J.I. Tokars; M.H. Grieco, J.T. Crawford; J. Williams; E.M. Sordillo; K.R. Ong; J.O. Kilburn; S.W. Dooley; K.G. Castro; W.R. Jarvis; S.D. Holmberg. 1992. An outbreak of multidrug resistant tuberculosis among hospitalized patients with acquired immunodeficiency syndrome. N Engl J Med; 326: 1514-21.

34. Chambers, H.F. 1988. Methicillin-resistant staphylococci. Clin Microb Rev; 1: 173-86.

35. Massanari, R.M., M.A. Pfaller; D.S. Wakefield; G.T. Hammons; L.A. McNutt; R.F. Woolson; C.H. Helms. 1988. Implications of acquired oxacillin resistance in the management and control of *S. aureus* infections. J Infect Dis; 158: 702-9.

36. Telenti, A., P. Imboden; F. Marchesi; T. Schmidheini; T. Bodmer. Direct, automated detection of rifampicin-resistant *M. tuberculosis* by polymerase chain reaction and single-strand confirmation polymorphism analysis. Antimicrob Agents Chemother; 37: 2054-58.

37. Clark, N.C., R.C. Cooksey; B.C. Hill; J.M. Swenson; F.C. Tenover. 1993. Characterization of glycopeptide resistant enterococci from U.S. hospitals. Antimicrob Agents Chemother; 37: 2311-17.

38. Arthur, M., P. Courvalin. 1993. Genetics and mechanisms of glycopeptide resistance in enterococci. Antimicrob Agents Chemother; 37: 1563-71.

39. Huang, M.B., T.E. Gay; C.N. Baker; S.N. Bannerjee; F.C. Tenover. 1993. Two percent sodium chloride is required for susceptibility testing of staphylococci with oxacillin when using agar-based dilution methods. J Clin Microbiol; 31: 2683-88.

40. Gay J.D., de Young D.R., Roberts G.D. 1984. In vitro activities of norfloxacin and ciprofloxacin against *Mycobacterium tuberculosis, M. avium* complex, *M. chelonei, M. fortuitum,* and *M. kansasii.* Antimicrob Agents Chemother; 26: 94-6.

41. Gellert M., Mizuuchi K., O' Dea M.H., Nash H.A. 1976. DNA gyrase : an enzyme that introduces superhelical turns into DNA. Proc Natl Acad Sci USA; 73: 3872-5.

42. Kirchausen T., Wang J.C., Harrison S.C. 1978. Purification of the subunits of *Escherichia coli* DNA gyrase and reconstitution of enzyme activity. Proc Natl Acad Sci USA; 75: 1773-7.

43. Gellert M., O' Dea M.H., Itoh T., Tomizava J. 1976. Novobiocin and coumeromycin inhibit DNA supercoiling catalyzed by DNA gyrase. Proc Natl Acad Sci USA; 73: 4474-8.

44. Kirkegaard K., Wand J.C. 1981. Mapping the topography of DNA wrapped around gyrase by nucleolytic and chemical probing of complexes of unique DNA sequences. Cell; 23: 721-9.

45. James D. Watson, Michael Gilman, Jan Witkowski, Mark Zoller. Recombinant DNA, 2nd Edition.

46. Lewis R.J., Tsai F.T.F., Wigley D.B. 1996. Molecular mechanism of drug inhibition by DNA gyrase. Bioessays; 18: 661-71.

47. Rees R.J., Maxwell A. 1991. DNA gyrase : Structure and function. Crit Rev Biochem Mol Biol; 26: 335-75.

48. Revel V., Cambau E., Jarlier E., Sougakoff W. 1994. Characterization of mutations in *Mycobacterium smegmatis* involved in resistance to fluoroquinolones. Antimicrob Agents Chemother; 38: 1991-6.

49. Ashok R., Awdhesh K., Nishat A. 1998. Multidrug-Resistant *Mycobacterium tuberculosis* : Molecular Perspectives. Emerging infectious deseases; Vol 4, No 2.

50. Inderlied C.B. 1991. Antimycobacterial agents : in vitro susceptibility testing, spectrums of activity, mechanisms of action and resistance, and assays for activity in biological fluids. In : Lorain V., editor. Antibiotics in laboratory medicine. Baltimore : Williams and Wilkins, Baltimore. p. 134-97.

51. Sugino, A., Peebles, C.L., Kreuzer, K.N., and Cozzarelli, N.R. 1977. Mechanism of action of Nalidixic acid : purification of *E. coli nal*A gene product and its relationship to DNA gyrase and a novel nicking-closing enzyme. Proc Natl Acad Sci USA; 74:4767-71.

52. Contreras, A., Maxwell., A. 1992. *gyr*B mutations which confer coumarin resistance also affect DNA supercoiling and ATP hydrolysis by *E. coli* DNA gyrase. Molecular Microbiology; 6(12): 1617-24.

53. Heifets, L.B., and P.J. Lindholm-Levy. 1990. MICs and MBCs of Win 57273 against *M. avium* and *M. tuberculosis*. Antimicrob Agents Chemother; 34: 770-4.

54. Chen Xu, et al. 1996. Fluoroquinolone Resistance Associated with Specific Gyrase Mutations in Clinical Isolates of Multidrug-Resistant *M. tuberculosis*. J Inf Dis; 174: 1127-30.

55. Canetti, G., Fox, W., Khomenko, A., Mahler, H.T., Menon, N.K., Mitchison, D.A., Rist, N., and Smelev, N.A. 1969. Advances in techniques of testing mycobacterial drug sensitivity, and the use of sensitivity tests in tuberculosis programmes, Bull. WHO; 41: 21.

56. Canetti, G., Froman, S., Grosset, J., Hauduroy, P., Langerova, M., Mahler, H.T., Meissner, G., Mitchison, D.A., and Sula, L. 1963. Mycobacteria : laboratory methods for testing drug sensitivity and resistance, Bull. WHO; 29: 565.

57. Leonid B. Heifets, et al. Drug susceptibility tests in the management of chemotherapy of tuberculosis. Drug susceptibility in the chemotherapy of mycobacterial infection. (Chapter 3), 103-104.

58. Deland, F.H. and Wagner, H.N. 1969. Early detection of bacterial growth with carbon-14 labelled glucose. Radiology; 92: 154.

59. McClatchy, J.K. 1970. Rapid method of microbial susceptibility testing. Infect Immun; 1: 421.

60. Bretey, J. and Jahan, M.T. 1971. La culture en atmosphere confinee des mycobacteries ensemencees en profondeur. Application a la mesure acceleree des resistances. Ann Inst Pasteur; 121: 349.

61. Bretey, J., Vexgez, P., Jahan, M.T., and Brouet, G. 1973. La sensibilite du bacille de Koch aux antibiotiques mesuree par sa respiration. Proc Soc Francaise de la Tuberculose. Seance ordinaire du 12 Mai: 1178.

62. Cummings, D.M., Ristroph, D., Camargo, E.E., Larson,S.M., and Wagner, H.N. 1975. Radiometric detection of the metabolic activity of *M. tb.* J Nucl Med; 16: 1189.

63. Middlebrook, G., Reggiardo, Z., and Tigertt, W.D. 1977. Automatable radiometric detection of growth of *Mycobacterium tuberculosis* in selective media. Am Rev Respir Dis; 115: 1067.

64. Roberts, G.D., Goodman, N.L., Heifets, L., Larsh, H.W., Lindner, T.H., McClatchy, J.K., McGinnis, M.R., Siddiqi, S.H., and Wright, P. 1983. Evaluation of the BACTEC radiometric method for recovery of mycobacteria and drug susceptibility testing of *M. tuberculosis* from acid-fast smear-positive specimens. J Clin Microbiol; 18: 689.

65. Bannister, E.R., et al. 1985. Comparison of detection, identification and drug susceptibility testing of mycobacteria by using the BACTEC radiometric method and conventional methods. Abstract C260, A.S.M. Annual Meeting, Lasvegas.

66. Robert, G.D., et al. 1983. Evaluation of BACTEC radiometric method for recovery of mycobacteria and drug susceptibility testing of *M. tuberculosis* from acid-fast smear-positive specimens. J Clin Microbiol; 18: 689-96.

67. Siddiqi, S.H., et al. 1981. Evaluation of a rapid radiometric method for drug susceptibility testing of *M. tuberculosis.* J Clin. Microbiol; 13: 908-12.

68. Siddiqi, S.H., et al. 1985. Interlaboratory drug susceptibility testingof *M. tuberculosis* by radiometric and two conventional methods. J Clin Microbiol; 22: 919-23.

69. Steadham, J.E., et al. 1985. Use of the BACTEC system for drug susceptibility testing of *M. tuberculosis, M. kansasii* and *M. avium* complex. Diagn Microbiol and Inf Dis; 3: 33-40.

70. Vincke, et al. 1982. Rapid susceptibility testing of *M. tuberculosis* by a radiometric technique. J Antimicrob Chemother; 10: 351-54.

71. Sanger, F., Nicklen, S., and Coulsen, A.R. 1977. DNA Sequencing with chain termination inhibitors. Proc Natl Acad Sci USA; 74: 5463-67.

72. Ausubel, F.M. 1993. Current Protocols in Molecularbiology.

73. Murray, B.M. 1991. New aspects of antimicrobial resistance and the resulting therapeutic dilemmas. J inf Dis; 163: 1185-94.

74. Neu, H.C. 1992. The crisis in antibiotic resistance. Science; 257: 1064-73.

75. Paw, B.H., Tieu, P.T., Kaback, M.M., Lim, J. and Neufeld, E. 1990. Frequency of three Hex A mutant alleles among Jewish and non-Jewish carriers identified in a Tay-Sachs screening program. Am J Hum Genet; 47: 698-705.

76. Rommens, J., Kerem, B.–S., Greer, W., Chang, P., Tsui, L.–C. and Ray, P. 1990. Rapid nonradiocative detection of the major cyctic fibrosis mutation. Am J Hum Genet; 46: 395-96.

77. Cai, S.–P., Eng, B., Kan, Y.W and Chui, D.H.K. 1991. A rapid and simple electrophoretic method for the detection of mutations involving small insertion and deletion: application to β-thalassemia. Hum Genet; 87: 728-30.

78. Clay, T.M., Bidwell, J.L., Howard, M.R. and Bradley, B.A. 1991. PCR-fingerprinting for selection of HLA matched unrelated marrow donors. Lancet; 337: 1049-52.

79. Farrar, G.J., Kenna, P., Jordan, S.A., Kumar-Singh, R., Kumphries, M.M., Sharp, E.M., Sheils, D.M. and Humphries, P. 1991. A three-base-pair deletion in the peripherin-RDS gene in one form of retinitis pigmentosa. Nature; 354: 478-80.

80. Gyllensten, U. and Allen, M. 1991. PCR-based HLA class II typing. PCR Meth and Applic; 1: 91-8.

81. Sorrentino, R., Cascino, I. And Tosi, R. 1992. Subgrouping of DR4 alleles by DNA heteroduplex analysis. Human Immunology; 33: 18-23.

82. Ruano, G. and Kidd, K.K. 1992. Modeling of heteroduplex formation during PCR from mixtures of DNA templates. PCR Methods Applic; 2: 112-6.

83. Ruano, R., Deinard, A.S., Tishkoff, S. and Kidd, K.K. 1994. Detection of DNA sequence variation via deliberate heteroduplex formation from genomic DNAs amplified en masse in "population tubes". PCR methods Applic; 3: 225-231.

84. Eric L. Delwart, Eugene G. Shpaer, Joost Louwagie, et al. 1993. Genetic Relationships Determined by a DNA Heteroduplex Mobility Assay : Analysis of HIV-1 *env* Genes. Science; 262: 1257-61.

85. Michael H. Bachmann, et al. 1994. Rapid Genetic Characterization of HIV Type 1 Strains from Four World Health Organization-Sponsored Vaccine Evaluation Sites Using a Heteroduplex Mobility Assay. AIDS Research and Human Retroviruses; 10: 1345-52.

86. Miyamoto, J., Koga, H., Kohno, S., Tashiro, T. and Hara, K. 1996. New drug susceptibility test for *M. tuberculosis* using the hybridization protection assay. J Clin Microbiol; 34: 1323-1326.

87. Koga, H., Miyamoto, J., Ohno, H., Ogawa, K., Tomono, K., Tashiro, T., and Kohno, S. 1997. A rapid drug susceptibility for *M. tuberculosis* using the hybridization protection assay. J Antimicrob Chemother; 40: 189-94.

88. King, T.C., and D. Schlessinger. 1983. S1 nuclease mapping analysis of ribosomal RNA processing in wild type and processing deficient *E. coli*. J Biol Chem; 258: 12034-42.

89. King, T.C., R. Sirdeskmukh, and D. Schlessinger. 1986. Nucleolytic processing of ribonucleic acid transcripts in prokaryotes. Microb Rev; 50: 428-51.

90. Gerard A. Cangelosi, William H. Brabant, Theresa B. Britschgi, and Carolyn K. Wallis. 1996. Detection of Rifampin- and Ciprofloxacin-Resistant *M. tuberculosis* by Using Species-Specific Assays for Precursor rRNA. Antimicrob Agents Chemother; 40(8); 1790-95.

91. He X; Zhuang Y; Li G. 1996. Application of PCR-SSCP technique in detection of *rpo*B gene mutation in rifampin-resistant *M. tuberculosis*. Chung Hua Chieh Ho Ho Hu Hsi Tsa Chih; 19(6): 338-41.

92. Cheng S; Yan B; Ma Y. 1996. Detection of *rpo*B gene mutation in *M. tuberculosis* by PCR "cold" SSCP. Chung Hua Chieh Ho Ho Hu Hsi Tsa Chih; 19(6): 333-7.

93. Victor TC; Warren R; Butt JL; et al. 1997. Genome and MIC stability in *M. tuberculosis* and indications for continuation of use of isoniazid in multidrug-resistant tuberculosis. J Med Microbiol; 46(10): 847-57.

94. Lee H; Cho SN; Bang HE; Lee JH; Bae GH; Kim SJ; Kim JD. 1998. Molecular analysis of rifampin-resistant *M. tuberculosis* isolated from Korea by polymerase chain reaction-single strand conformation polymorphism sequence analysis. Int J Tuberc Lung Dis; 2(7): 585-9.

95. Nadine Honore and Stewart T. Cole. 1994. Streptomycin Resistance in Mycobacteria. ASM; 38(2): 238-42.

96. Orita, M., Y. Suzoki, T. Sekiya, and K. Hayashi. 1989. Rapid and sensitive detection of point mutations and DNA polymorphisms using the polymerase chain reaction. Genomics; 5: 874-9.

97. Tanno Y; Tanaka K; Tsuji S. 1997. The correlation of the heteroplasmy of mtDNA and clinicopathological findings in the patients with mitochondrial encephalomyopathies. Nippon Rinsho; 55(12): 3270-6.

98. Salman H., Siddiqi. 1989. BACTEC TB System Product and Procedure Manual. Becton Dickinson.

99. _____. 1997. T7 Sequenase V2.0 PCR product sequencing kit. Amersham Life Science, Inc.

100. Hooper D., Wolfson J. 1993. Mechanisms of bacterial resistance to quinolones. In : Hooper D., Wolfson J., eds. Quinolone antimicrobial agents. Washington, DC : ASM; 97-118.

101. Ferrerol, Cameron B., Manse B., et al. 1994. Cloning and primary structure of *Staphylococcus aureus* DNA topoisomerase IV : a primary target of fluoroquinolones. Mol Microbiol; 13: 641-53.

APPENDIX I

REAGENTS AND EQUIPMENTS

1. REAGENTS

Absolute ethanol	(Merck,Germany)
Acrylamide/bisacrylamide	(Biorad,U.S.A)
Agarose (ultrapure)	(Amresco,U.S.A)
Ammonium persulfate	(Biorad,U.S.A)
Boric acid	(Merck,Germany)
Developer	(Kodak,Japan)
Ethidium bromide	(Amresco,U.S.A)
EDTA	(Amresco,U.S.A)
Fixer	(Kodak,Japan)
Glacial acetic acid	(Merck,Germany)
Methanol	(Merck,Germany)
Phenol	(BRL,U.S.A)
Sodium dodecyl sulfate	(Merck,Germany)
Sodium hydroxide	(Merck,Germany)
N,N,N,N-tetramethylethylenediamine (TEMED)	(Biorad,U.S.A)
Tris (ultrapure)	(Amresco,U.S.A)
Urea	(Promega,U.S.A)

2. EQUIPMENTS

Chromatography paper no.3	(Whatmann,England)
Gel dryer	(Biorad,U.S.A)
Sequencing gel model SA-60	(BRL,U.S.A)
X-ray film, T-Mat™ 35x43 cm	(Kodax,Japan)

APPENDIX II

REAGENT PREPARATION

1. 0.5M EDTA, pH 8.0

Disodium ethylene diamine tetraacetate.$2H_2O$	186.1 g
DDW	800.0 ml
Adjust pH to 8.0 with sodium hydroxide pellet	
Adjust volume to 1,000 ml	

2. 3M Sodium acetate, pH 5.0

Sodium acetate.$3H_2O$	408.1 g
DDW	800.0 ml
Adjust pH to 5.0 with glacial acetic acid	
Adjust volume to 1,000 ml	

3. 1M Tris-Cl, pH 8.0

Tris (ultrapure)	121.1 g
DDW	800.0 ml
Adjust to pH 8.0 by adding conc.HCl	42.0 ml
Sterilize by autoclaving	

4. 50x Tris-acetate buffer (TAE)

Tris (ultrapure)	242.0 g
Glacial acetic acid	57.1 ml
0.5M EDTA, pH 8.0	100.0 ml

Adjust volume to 1,000 ml with DDW

Sterilize by autoclaving

5. TE buffer

1M Tris-Cl, pH 8.0	0.5 ml
0.5M EDTA, pH 8.0	0.2 ml
DDW	9.3 ml

6. 10x Tris-borate buffer

Tris (ultrapure)	108.0 g
Boric acid	55.0 g
0.5M EDTA, pH 8.0	40.0 ml

Adjust volume to 1,000 ml with H_2O

Sterilize by autoclaving

7. Proteinase K solution

Proteinase K 10 mg/ml in 0.2M Tris pH 8.3

8. 7H11 medium

7H11 agar	21.0 g
DDW	500.0 ml
Glycerol	5.0 ml

Boil to dissolve completely. Sterilize by autoclaving.

Adding 100 ml Bacto Middlebrook OADC Enrichment to the medium at 50-55 °C, mix well

9. 7H11 + ciprofloxacin medium

7H11 medium	100.0 ml

Adding ciprofloxacin to final concentration of 2 μg/ml at about 55°C after autoclaving

10. 6% polyacrylamide gel (60 mL)

urea	25.2 g
10x Tris-borate buffer	6.0 ml
40% acrylamide/2% bisacrylamide	9.0 ml
H_2O	26.0 ml
TEMED	40.0 μl
10% Ammonium persulfate	400.0 μl

11. 10% Ammomium persulfate

Ammonium persulfate	1 g
H_2O	10 ml
freshly preparation before used	

12. BACTEC® 7H12 broth (4.0 mL)

7H9 broth base

Casein hydrolysate

Bovine serum albumin

Catalase

^{14}C-fatty acid

BIOGRAPHY

Miss Chudaachhara Unhasuta was born on October 8, 1971 in Bankok, Thailand. She graduated with a Bachelor of Science in Microbiology from the Faculty of Science at Kasetsart University in 1993.

Miss Chudaachhara is currently working as a scientist in the Department of Microbiology, Faculty of Medicine, Chulalongkorn University.