

## REFERENCES

- (1) Kandler, O., and Weiss, N. 1986. Genus *Lactobacillus*. In P.H.A. Sneath, N.S. Mair, M.E. Sharpe, and J.G. Holt (eds.), **Bergey's manual of systematic bacteriology**, vol 2, 9<sup>th</sup> ed., 1208-1234. Baltimore, MD: Williams and Wilkins.
- (2) Hartemink, R., Domenech, V.R., and Rombouts, F.M. 1997. LAMVAB-A new selective medium for the isolation of lactobacilli from faeces. **J of Microbiol Methods** 29: 77-84.
- (3) Silvi, S., Verdenelli, M.C., Orpiane, C., and Cresci, A. 2003. EU project crown a life: functional foods, gut microflora and healthy ageing: Isolation and identification of *Lactobacillus* and *Bifidobacterium* strains from faecal samples of elderly subjects for a possible probiotics use in functional foods. **J of Food Engineering** 56: 195-200.
- (4) Arici, M., Bilgin, B., Sagdic, O., and Ozdemir, C. 2004. Some characteristics of *Lactobacillus* isolates from infant faeces. **Food Microbiol** 21: 19-24.
- (5) Pena, J.A., Li, S.Y., Wilson, P.H., Thibodeau, S.A., Szary, A.J., and Versalovic, J. 2004. Genotypic and phenotypic studies of murine intestinal Lactobacilli: Species differences in mice with and without colitis. **Appl and Environ Microbiol** 70: 558-568.

- (6) Nitisinprasert, S., Nilphai, V., Bunyun, P., Sukyai, P., Doi, K., and Sonomoto, K. 2000. Screening and identification of effective thermotolerant lactic acid bacteria producing antimicrobial activity against *Escherlichia coli* and *Salmonella* sp. resistant to antibiotics. **Kasetsart J (Nat Sci)** 34: 387-400.
- (7) Tanasupawat, S., Thongsanit, J., Okada, S., and Komayata, K. 2002. Lactic acid bacteria isolated from soy sauce mash in Thailand. **J Gen Appl Microbiol** 48: 201-209.
- (8) Penacchia, C., Ercolini, D., Blaiotta, G., Pepe, O., Mauriello, G., and Villani, F. 2004. Selection of *Lactobacillus* strains from fermented sausages for their potential use as probiotics. **Meat Science** 67: 309-317.
- (9) Schillinger, U. 1999. Isolation and identification of lactobacilli from novel-type probiotics and mild yogurts and their stability during refrigerated storage. **Int J of Food Microbiol** 47: 79-87.
- (10) Reid, G. 1999. The scientific basis for probiotic strains of *Lactobacillus*. **Appl and Environ Microbiol** 65: 3763-3766.
- (11) Berg, R.D. 1998. Probiotics, prebiotics or conbiotics. **Trends Microbiol** 6: 89-92.
- (12) Finegold, S.M., Sutter, V.L., Sugihara, P.T., Elder, H.A., Lehmann, L.V.N., Phillips, R.L. 1977. Fecal microbial flora in seventh day advent populations and control subjects. **Am J Clin Nutr** 30: 1781-1792.
- (13) Fuller, R. 1989. Probiotics for treatment of gastrointestinal infection in man and animals. **J Appl Bacteriol** 66: 365-378.

- (14) Macfarlane, G., and Cummings, J. 2000. Probiotics, infection and immunity. **Curr Opin Infect Dis** 15: 501-506.
- (15) Madsen, K. 2001. The use of probiotics in gastrointestinal disease. **Can J Gastroenterol** 15: 817-822.
- (16) Rolfe, R.D. 2000. Symposium: Probiotic bacteria: Implications for human health: The role of probiotic cultures in the control of gastrointestinal health. **American Society for Nutritional Sciences Suppl**: 396S-402S.
- (17) Collins, J.K. 1998. Thornton G and O'Sullivan GO. Selection of probiotics strains for human application. **Int Dairy J** 8: 487-490.
- (18) Saxelin, M. 1997. *Lactobacillus* GG: a human probiotic strain with through clinical documentation. **Food Rev Int** 13: 293-313.
- (19) Spanhaak S, Havenaar R, Schaafsma G. 1998. The effect of consumption of milk fermented by *Lactobacillus casei* strain Shirota on the intestinal microflora and immune response parameters in humans. **Eur J Clin Nutr** 52: 899-907.
- (20) Bernet, M.F., Brassart, D., Neeser, J.R., and Servin, A.L. 1994. *Lactobacillus acidophilus* LA1 binds to cultured human intestinal cell-line and inhibits cell attachment and cell invasion by enterovirulent bacteria. **Gut** 35: 483-489.
- (21) Gill, H.S. 2003. Probiotics to enhance anti-infective defenses in the gastrointestinal tract. **Best Practice and Res Clin Gastroenterol** 17: 755-773.

- (22) Drago, L., Gismando, M.R., Lombadi, A., Haen, C., and Gozzini, L. 1997. Inhibition of in vitro growth of enteropathogens by new *Lactobacillus* isolates of human intestinal origin. **FEMS Microbiol Let** 153: 455-463.
- (23) Shu, Q., and Gill, H.S. 2002. Immune protection mediated by the probiotic *Lactobacillus rhamnosus* HN001 (DR20™) against *Escherichia coli* O157:H7 infection in mice. **FEMS Immunol and Med Microbiol** 34: 59-64.
- (24) Alvarez-Olmos, M.I., and Oberhelman, R.A. 2001. Probiotic agents and infectious diseases: a modern perspective on a traditional therapy. **Clin Infect Dis** 32: 1567-1576.
- (25) Go, M.F. 2002. Natural history and epidemiology of *Helicobacter pylori* infection. **Aliment Pharmacol Ther** 16 (suppl.1): 1-15.
- (26) Barefoot, S.M., and Klaenhammer, T.D. 1983. Detection and activity of lactacin B, a bacteriocin produced by *Lactobacillus acidophilus*. **Appl Environ Microbiol** 45: 188-1815.
- (27) Talarico, L.T., Casas, I.A., Chung, C.T., and Dobrogosz, J.W. 1988. Production and isolation of reuterin, a growth inhibitor produced by *Lactobacillus reuteri*. **Antimicrob Agents Chemother** 32:1854-1858.
- (28) Szagewska, H., Kotowska, M., and Mrukowicz, J.Z. 2001. Efficacy of *Lactobacillus* GG in prevention of nosocomial diarrhea in infants. **J of Pediatrics** 138: 361-365.

- (29) Gorbach, S.L., Chang, T.W., and Goldin, B. 1987. Successful treatment of relapsing *Clostridium difficile* colitis with *Lactobacillus* GG. **Lancet** 2: 1519.
- (30) Naaber, P., et al. 2004. Inhibition of *Clostridium difficile* strains by intestinal *Lactobacillus* species. **J Med Microbiol** 53: 551-554.
- (31) Shonikova, A.V., et al. 1997. *Lactobacillus reuteri* as a therapeutic agent in acute diarrhea in young children. **J of Pediatric Gastroenterol and Nutr** 24: 399-404.
- (32) Marteau, P., Seksik, P., and Jain, R. 2002. Probiotics and intestinal health effects: a clinical perspective. **British J of Nutr** 88: S51-S57.
- (33) Felly, C.P., et al. 2001. Favorable effects of an acidified milk (LC-I) on *Helicobacter pylori* gastritis in man. **European J of Gastroenterol and Hepatol** 13: 25-29.
- (34) Aiba, Y., Suzuki, N., Kabir, A. M., Takagi, A., and Koga, Y. 1998. Lactic acid mediated suppression of *Helicobacter pylori* by the oral administration of *Lactobacillus salivarius* as a probiotic in a gnotobiotic murine model. **Am J Gastroenterol** 93: 2097-2101.
- (35) Forestier, C., Champs, C.D., Vatoux, C., and Joly, B. 2001. Probiotics activities of *Lactobacillus casei rhamnosus*: in vitro adherence to intestinal cells and antimicrobial properties. **Res Microbiol** 152: 167-173.
- (36) El-Naggar, M.Y.M. 2004. Comparative study of probiotics cultures to control the growth of *Escherichia coli* O157:H7 and *Salmonella typhimurium*. **Biotechnology** 3(2): 173-180.

- (37) Lu, L., and Walker, W.A. 2001. Pathologic and physiologic interaction of bacteria with the gastrointestinal epithelium. **Am J Clin Nutr** 7: 1124S-1130S.
- (38) Hamilton-Miller, J.M.T. 2003. The role of probiotics in the treatment and prevention of *Helicobacter pylori* infection. **Int J Antimicrob Agent** 22: 360-366.
- (39) Huang, Y., Pena, A.J., and Versalovic, J. *Lactobacillus*-mediated antagonism of lipopolysaccharide-or *Clostridium difficile* toxin A-stimulated interleukin-8 production by human intestinal epithelial cells. **(Submitted for publication)**.
- (40) Wolfs, T.G. 2002. In vivo expression of Toll-like receptor 2 and 4 by renal epithelial cells: IFN- $\gamma$  and TNF- $\alpha$  mediated up-regulation during inflammation. **J Immunol** 168: 1286-1293.
- (41) Bai, A.P., and Ouyang, Q. 2006. Probiotics and inflammatory bowel diseases. **Postgrad Med J** 82: 326-382.
- (42) Aderem, A., and Ulevitch, R.J. 2000. Toll-like receptors in the induction of the innate immune response. **Nature** 406: 782-787.
- (43) Ulevitch, R.J., and Tobias, P.S. 1999. Recognition of gram-negative bacteria and endotoxin by the innate immune system. **Curr Opin Immunol** 11: 19-22.
- (44) Isolauri, E., Salminen, S., and Ouwehand, A.C. 2004. **Probiotics. Best Practice and Res Clin Gastroenterol** 18: 299-313.

- (45) Pena, J.A., and Versalovic, J. 2003. *Lactobacillus rhamnosus* GG decreases TNF- $\alpha$  production in lipopolysaccharide-activated murine macrophages by a contact independent mechanism. **Cell Microbiol** 5: 277-285.
- (46) Chan Remillard, S.K.W., and Ozimek, L. 2006. Inhibition of tumour necrosis factor by lactic acid bacteria in mouse macrophages. **DRTC Dairy Day**. 45-46.
- (47) Pena, J.A., Rogers, A.B., GeZ Ng, V., Li, S.Y., Fox, J.G., and Versalovic, J. 2005. Probiotic *Lactobacillus* spp diminish *Helicobacter hepaticus*-induced inflammatory bowel disease in interleukin-10-deficient mice. **Infect Immun** 73: 912-920.
- (48) Madsen, K.L., Doyle, J.S., Jewell, L.D., Tavernini, M.M., and Fedorak, R.N. 1999. *Lactobacillus* species prevents colitis in interleukin 10 gene-deficient mice. **Gastroenterol** 166: 1107-1114.
- (49) Lin, Y.P., and Versalovic, J. 2006. Immunoregulation by probiotics. **AgroFood industry hi-tech** 17: 56-59.
- (50) Tannock, W.G. 2004. A special fondness for lactobacilli. **Appl Environ Microbiol** 70(6): 3189-3194.
- (51) deMan, J.C., Rogosa, M., and Sharpe, M.E. 1960. A medium for the cultivation of lactobacilli. **J Appl Bacteriol** 23: 130-135.
- (52) Hammes, W.P., and Vogel, R.F. 1995. The Genus *Lactobacillus*. In B.J.B. Wood, and W.H. Holzapfel (eds.), **The genera of lactic acid bacteria**, Vol 2, 1<sup>st</sup> ed., pp 19-49. Glasgow, Germany: Chapman and Hall.

- (53) Carr, J.G., Cutting, C.V., and Whiting, G.C. (eds.). 1975. **Lactic acid bacteria in beverages and food**. Proceedings of a symposium held at Long Ashton Research Station University of Bristol. London: Academic Press.
- (54) Sharpe, M.E. 1981. The genus *Lactobacillus*. In Starr, Stolp, Truper, Balows and Schlegel (eds.), **The prokaryotes, A handbook on habitats, isolation and identification of bacteria**, pp 1653-1679. New York: Springer.
- (55) Scolari, G., Torriani, S., and Vescovo, M. 1999. Partial characterization and plasmid linkage of a non-proteinaceous antimicrobial compound in a *Lactobacillus casei* and vegetable origin. **J Appl Microbiol** 86: 682-688.
- (56) Kandler, O. 1984. Current taxonomy of lactobacilli. **Ind Microbiol** 25: 109-123.
- (57) Davis, J.G. 1975. The microbiology of yoghurt. In J.G Carr, C.V. Cutting, and G.C. Whiting (eds.), **Lactic acid bacteria in beverages and food**, pp 245-263. London: Academic press.
- (58) Reuter, G. 1975. Classification problems, ecology and some biochemical activities of lactobacilli of meat product. In J.G Carr, C.V. Cutting, and G.C. Whiting (eds.), **Lactic acid bacteria in beverages and food**, pp 221-229. London: Academic press.



- (59) Mikelsaar, M., Mander, R., Sepp, E., and Annuk, H. 2004. Human lactic acid microflora and its role in the welfare of the host. In S. Salmonen, A.vanWright, and A. Ouwehand, **Lactic Acid Bacteria: Microbiology and Function Aspects**, 3<sup>rd</sup> ed., pp 453-505. New York: Marcel Dekker.
- (60) Vasquez, A, Jakobsson, T., Ahrne, S., Forsum, U., and Molin, G. 2002. Vaginal *Lactobacillus* flora of healthy Swedish women. **J Clin Microbiol** 40: 2746-2749.
- (61) Anukam1, K.C., Osazuwa E.O., Ahonkhai, I., and Reid, G. 2005. 16S rRNA gene sequence and phylogenetic tree of *Lactobacillus* species from the vagina of healthy Nigerian women. **African Journal Biotechnology** 4: 1222-1227.
- (62) Fabio Dal Bello. 2005. Ecological studies of the *Lactobacillus* biota in the human digestive tract and adaptation of intestinal lactobacilli to the sourdough ecosystem. **Doctoral dissertation**. Fakultät Naturwissenschaften der Universität Hohenheim. Italy.
- (63) Drasar, B. S., and Hill, M. J. 1974. **Human intestinal flora**. London, UK: Academic Press.
- (64) Mitsuoka, T. 1992. The human gastrointestinal tract. In B. J. B. Wood (ed.), **The lactic acid bacteria, The lactic acid bacteria in health and disease**, vol. 1, pp. 69-114. London, UK: Elsevier Applied Science.

- (65) Reuter, G. 2001. The *Lactobacillus* and *Bifidobacterium* microflora of the human intestine: composition and succession. **Curr Issues Intest Microbiol** 2: 43-53.
- (66) Kimura, K., McCartney, A.L., McConnell, M.A., and Tannock, G. W. 1997. Analysis of faecal population of bifidobacteria and lactobacilli and investigation of the immunological responses of their human host to the predominant strains. **Appl Environ Microbiol** 63: 3394-3398.
- (67) Tannock, G., et al. 2000. Analyses of the fecal microflora of human subjects consuming a probiotic product containing *Lactobacillus rhamnosus* DR20. **Appl Environ Microbiol** 66: 2578-2588.
- (68) Walter, J., Hertel, C., Tannock, G. W., Lis, C. M., Munro, K., and Hammes, W. P. 2001. Detection of *Lactobacillus*, *Pediococcus*, *Leuconostoc*, and *Weissella* species in human feces by using group-specific PCR primers and denaturing gradient gel electrophoresis. **Appl Environ Microbiol** 67: 2578-2585.
- (69) Heilig, H. G. H. J., et al. 2002. Molecular diversity of *Lactobacillus* spp. and other lactic acid bacteria in the human intestine as determined by specific amplification of 16S ribosomal DNA. **Appl Environ Microbiol** 68: 114-123.
- (70) Ahrnè, S., Nobaek, S., Jeppsson, B., Adlerberth, I., Wold, A.E., and Molin, G. 1998. The normal *Lactobacillus* flora of healthy human rectal and oral mucosa. **J Appl Microbiol** 85: 88-94.

- (71) Tannock, G. W. 1995. **Normal Microflora**. An introduction to microbes inhabiting the human body. London, UK: Chapman and Hall.
- (72) Metchnikoff, E. 1907. **The prolongation of life: Optimistic studies**. London: William Heinemann.
- (73) Metchnikoff, E. 1908. **The nature of man**. Studies in optimistic philosophy. William Heinemann, London.
- (74) Reid, G., and Hammand, J.A. 2005. Probiotics: some evidence of their effectiveness. **Can Fam Physician** 51: 1487-1493.
- (75) Ouwehand, A.C., and Vestterlund, S. 2004. Antimicrobial components from lactic acid bacteria; In S. Salmonen, A.vanWright, and A. Ouwehand, **Lactic Acid Bacteria: Microbiology and Function Aspects**, 3<sup>rd</sup> ed., pp375-395. New York: Marcel Dekker.
- (76) Blom, H., and Mortvedt, C. 1991. Anti-microbial substances produced by food associated microorganisms. **Biochem Soc Trans** 19: 694-698.
- (77) Suomalainen, T.H., Mayra-Makinen, A.M. 1999. Propionic acid bacteria as protective cultures in fermented milks and breads. **Lait** 79: 16-174.
- (78) Rubin, H.E. 1978. Toxicological model for a two-acid system. **Apply Env Microbiol** 36: 623-624.
- (79) Vallor, A.C., Antonio, M.A.D., Hawse, S.E., and Hillier, S.L. 2001. Factors associated with acquisition of, or persistent colonization by, vaginal lactobacilli: role of hydrogenperoxide production. **J Infect Dis** 184: 1431-1436.

- (80) Jay, J.M. 1982. Antimicrobial properties of diacetyl. **Appl Env Microbiol** 44: 525-532.
- (81) Kang, D.H., and Fung, D.Y. 1999. Effects of diacetyl on controlling *E. coli* O157:H7 and *Salmonella* Typhimurium in the presence of starter culture in a laboratory medium and during meat fermentation. **J Food Prot** 62: 975-979.
- (82) Axelsson, L.T. 1990. *Lactobacillus reuteri*, a member of the gut bacteria flora. In Department of Microbiology, University of Agricultural Sciences, pp.1-64: Uppsala, Sweden.
- (83) Veiga da Cunha, M., and Foster, M.A. 1992. Sugar-glycerol co-fermentations in lactobacilli: the fate of lactate. **J Bacteriol** 174: 1013-1019.
- (84) Talarico, T.L., Axelsson, L.T., Novotny, J., Fiuzat, M., and Dobrogosz, W.J. 1990. Utilization of glycerol as a hydrogen receptor by *Lactobacillus ruteri*: purification of 1,3-propanediol:+NAD+oxidoreductase. **Appl Env Microbiol** 56: 943-948.
- (85) Axelsson, L.T., Chung, T.C., Dobrogosz, W.J., and Lindgren, S.E. 1989. Production of a broad spectrum antimicrobial substance by *Lactobacillus reuteri*. **Microb Ecol Health Dis** 2: 131-136.
- (86) Chung, T.C., Axelsson, L.T., Lindgren, S.E., and Dobrogosz, W.J. 1989. In vitro studies on reuterin synthesis by *Lactobacillus reuteri*. **Microb Ecol Health Dis** 2: 137-144.
- (87) Dobrogosz, W.J., et al. 1989. *Lactobacillus reuteri* and the enteric microbiota. In E. Norin (ed.), **The regulation and protective role of the normal microflora**, pp. 283-292, New York: Stockton press.

- (88) Spinler, J.K., Taweechotipatr, M., Rognerud, C.L., Ou, C.N., Tumwasorn, S., and Versalovic, J. 2008. Human-derived probiotic *Lactobacillus reuteri* demonstrates antimicrobial activities targeting diverse enteric bacterial pathogens. **Anaerobe** (Epub ahead of print).
- (89) Cleveland, J., Montville, T.J., Nes, I.F., Chikindas, M.L. 2001. Bacteriocins: safe, natural antimicrobials for food preservative. **Int J Food Microbiol** 71: 1-20.
- (90) Fooks, L.J., and Gibson, G.R. 2002. Probiotics as modulators of the gut flora. **British Journal of Nutrition** 88: S39-S49.
- (91) Sarkar, P.K., and Banerjee, S. 1996. Antibacterial activity of lactic acid bacteria isolates obtained from natural habitats. **J Food Sci Tec** 33: 231-233.
- (92) Pulusani, S.R., Rao, D.R., and Sunki, G.R. 1979. Antimicrobial activity of lactic cultures: partial purification and characterization of antimicrobial compound(s) produced by *Streptococcus thermophilus*. **J Food Sci** 44: 575-578.
- (93) Fleming, H.P., Etchells, J.L., and Costilow, R.N. 1975. Microbial inhibition by an isolate of *Pediococcus* from cucumber brines. **Appl Microbiol** 30: 1040-1042.
- (94) Schillinger, U., and Lucke, F.K. 1989. Antibacterial activity of *Lactobacillus sake* isolated from meat. **Appl Environ Microbiol** 55: 1901-1906.

- (95) Budde, B.B., and Rasch, M. 2001. A comparative study on the use of flow cytometry and colony forming units for assessment of the antibacterial effect of bacteriocins. **Int J Food Microbiol** 63: 65-72.
- (96) Hastings, J., Baldwin, T., and Nicoli, M. 1978. Bacterial luciferase: assay, purification and properties. **Methods Enzymol** 57: 135-152.
- (97) Fooks, L.J., Fuller, R., and Gibson, G.R. 1999. Prebiotics, probiotics and human gut microbiology. **Int Dairy J** 9: 53-61.
- (98) Fuller, R. 1992. History and development of probiotics. In R. Fuller (ed.), **Probiotics-the scientific basis**, chap.1. New York: Chapman and Hall.
- (99) Shortt, C. 1999. The probiotic century: historical and current perspectives. **Trends in Food Science & Technology** 10: 411-417.
- (100) Gorbach, S. L. 2002. Probiotics in the third millennium. **Digest Liver Dis** 34 (21): S2-S7.
- (101) Stanton, C., et al. 2001. Market potential for probiotics. **Am J Clin Nutr** 73: 476S-483S.
- (102) Ouwehand, A.C., Kirjavainen, P.V., Shortt, C., and Salminen, S. 1999. Probiotics: mechanisms and established effects. **Int Dairy J** 9: 43-52.
- (103) Fuller, R. 1989. Probiotics in man and animals. **J Appl Bacteriol** 66: 365-378.

- (104) Havenaar, R., and Huis in't Veld, J.H.J. 1992. Probiotics; a general view. In B.J.B. Wood (ed.), **The lactic acid bacteria: The lactic acid bacteria in health and disease**. Vol.1, pp. 209-248. New York: Chapman and Hall.
- (105) Salminen, S., Ouwenhand, A., Benno, Y., and Lee, Y.K. 1999. Probiotics: how should they be defined? **Trends Food Sci Tech** 10: 107-110.
- (106) Salminen, S., Ouwenhand, A., and Isolauri, E. 1998. Clinical application of probiotic bacteria. **Int Dairy J** 8: 563-572.
- (107) Tuomola, E., Crittenden, R., Playne, M., Isolauri, E., and Salminen, S. 2001. Quality assurance criteria for probiotic bacteria. **Am J Clin Nutr** 73: 393S-398S.
- (108) FAO/WHO. 2001. Evaluation of health and nutritional properties of power milk with live lactic acid bacteria, report from **FAO/WHO expert consultation**, Cordoba, Argentina.
- (109) Lee, Y.K., and Salminen, S. 1995. The coming of age of probiotics. **Trends Food Sci Tech** 6: 241-245.
- (110) Ouwehand, A.C. 1998. Antimicrobial components from lactic acid bacteria. In: S. Salminen, and A. von Wright (eds.), **Lactic acid bacteria, microbiology and functional aspects**, pp. 139-160. New York: Marcel Dekker.
- (111) Colum, D., et al. 2001. In vitro selection criteria for probiotic bacteria of human origin: correlation with in vivo findings. **Am J Clin Nutr** 73: 386S-392S.

- (112) Conway, P.L., Gorbach, S.L., and Goldin, B.R. 1987. Survival of lactic acid bacteria in the human stomach and adhesion to intestinal cells. **J Dairy Sci** 70: 1-12.
- (113) Goldin, B. R., Gorbach, S. L., Saxelin, M., Barakat, S., Gualtieri, L., and Salminen, S. 1992. Survival of *Lactobacillus* species (strain GG) in human gastrointestinal tract. **Dig Dis Sci** 37: 121-128.
- (114) Kleeman, E. G., and Klaenhammer, T. R. 1982. Adherence of *Lactobacillus* species to human fetal intestinal cells. **J Dairy Sci** 65: 2063-2069.
- (115) Castagliuolo, I., LaMont, J. T., Nikulasson, S. T., and Pothoulakis, C. 1996. *Saccharomyces boulardii* protease inhibits *Clostridium difficile* toxin A effects in the rat ileum. **Infect Immun** 64: 5225-5232.
- (116) Pothoulakis, C., et al. 1993. *Saccharomyces boulardii* inhibits *Clostridium difficile* toxin A binding and enterotoxicity in rat ileum. **Gastroenterology** 104: 1108-1115.
- (117) Malin, M., Suomalainen, H., Saxelin, M., and Isolauri, E. 1996. Promotion of IgA immune response in patients with Crohn's disease by oral bacteriotherapy with *Lactobacillus* GG. **Ann Nutr Metab** 40: 137-145.
- (118) Berg, R.D. 1998. Probiotics, prebiotics or "conbiotics". **Trends Microbiol** 6: 89-92.
- (119) Chaveerach, P., Lipman, L.J.A., and van Knapen, F. 2004. Antagonistic activities of several bacteria on in vitro growth of 10 strains of *Campylobacter jejuni/coli*. **Int J Food Microbiol** 90: 43-50.



- (120) Batdorj, B., et al. 2007. Isolation, taxonomic identification and hydrogen peroxide production by *Lactobacillus delbrueckii* subsp. *lactis* T31, isolated from Mongolian yoghurt: inhibitory activity on food-borne pathogens. **J Appl Microbiol** 103: 584-593.
- (121) Lee, Y.J., Yu, W.K., and Heo, T.R. 2003. Identification and screening for antimicrobial activity against *Clostridium difficile* of *Bifidobacterium* and *Lactobacillus* species isolated from healthy infant faeces. **Int J Antimicrob Agent** 21: 340-346.
- (122) Meurman, J. H., Antila, H., Korhonen, A., And Salminen, S. 1995. Effect of *Lactobacillus rhamnosus* strain GG (ATCC 53103) on the growth of *Streptococcus sobrinus* in vitro. **Eur J Oral Sci** 103: 253-258.
- (123) Silva, M., Jacobus, N. V., Deneke, C., and Gorbach, S. L. 1987. Antimicrobial substance from a human *Lactobacillus* strain. **Antimicrob Agents Chemother** 31: 1231-1233.
- (124) Bartlett, J. G. 1992. Antibiotic-associated diarrhea. **Clin Infect Dis** 15: 573-581.
- (125) Nord, C. E., Heimdal, A., and Kager, L. 1986. Antimicrobial induced alterations of the human oropharyngeal and intestinal microflora. **Scand J Infect Dis** 49: 64-72.
- (126) McFarland, L. V., et al. 1995. Prevention of beta-lactamase associated diarrhea by *Saccharomyces boulardii* compared with placebo. **Am J Gastroenterol** 90: 439-448.

- (127) Gotz, V., Romankiewicz, J. A., Moss, J., and Murray, H. W. 1979. Prophylaxis against ampicillin-associated diarrhea with a *Lactobacillus* preparation. **Am J Hosp Pharm** 36: 754-757.
- (128) Clabots, C. R., Johnson, S., Olson, M. M., Peterson, L. R., and Gerding, D. N. 1992. Acquisition of *Clostridium difficile* by hospitalized patients: evidence for colonized new admissions as a source of infection. **J Infect Dis** 166: 561-567.
- (129) Fekety, R., and Shah, A. B. 1993. Diagnosis and treatment of *Clostridium difficile* colitis. **J Am Med Assoc** 269: 71-75.
- (130) McFarland, L. V., Mulligan, M. E., Kwok, R. Y., and Stamm, W. E. 1989. Nosocomial acquisition of *Clostridium difficile* infection. **N Engl J Med** 320: 204-210.
- (131) Walters, B. A., Roberts, R., Stafford, R. & Seneviratne, E. 1998. Relapse of antibiotic associated colitis: endogenous persistence of *Clostridium difficile* during vancomycin therapy. **Gut** 24: 206-212.
- (132) McFarland, L. V., et al. 1994. A randomized placebo-controlled trial of *Saccharomyces boulardii* in combination with standard antibiotics for *Clostridium difficile* disease. **J Am Med Assoc** 271: 1913-1918.
- (133) Majamaa, H., Isolauri, E., Saxelin, M. & Vesikari, T. 1995. Lactic acid bacteria in the treatment of acute rotavirus gastroenteritis. **J Pediatr Gastroenterol Nutr** 20: 333-338.
- (134) Middleton, P. J., Szymanski, M. T., and Petric, M. 1977. Viruses associated with acute gastroenteritis in young children. **Am J Dis Child** 131: 733-737.

- (135) Isolauri, E., Kaila, M., Mykkanen, H., Ling, W. H., and Salminen, S. 1994. Oral bacteriotherapy for viral gastroenteritis. **Dig Dis Sci** 39: 2595-2600.
- (136) Kaila, M., Isolauri, E., Soppi, E., Virtanen, E., Laine, S., and Arvilommi, H. 1992. Enhancement of the circulating antibody secreting cell response in human diarrhea by a human *Lactobacillus* strain. **Pediatr Res** 32: 141-144.
- (137) Isolauri, E., Juntunen, M., Rautanen, T., Sillanaukee, P., and Koivula, T. 1991. A human *Lactobacillus* strain (*Lactobacillus casei* sp strain GG) promotes recovery from acute diarrhea in children. **Pediatrics** 88: 90-97.
- (138) Hilton, E., Kolakowski, P., Singer, C., and Smith, M. 1997. Efficacy of *Lactobacillus* GG as a diarrheal preventive in travelers. **J Travel Med** 4: 41-43.
- (139) Oksanen, P. J., et al. 1990. Prevention of travellers' diarrhoea by *Lactobacillus* GG. **Ann Med** 22: 53-56.
- (140) Scarpignato, C., and Rampal, P. 1995. Prevention and treatment of traveler's diarrhea: a clinical pharmacological approach. **Chemotherapy** 41, (suppl. 1): 48-81.
- (141) Midolo, P.D., Lambert, J.R., Hull, R.R., and Luo, F. 1995. In vitro inhibition of *Helicobacter pylori* by organic acids and lactic acid bacteria. **J Appl Bacteriol** 79: 475-479.
- (142) Lambert, J.R., and Hull, R.R. 1996. Upper gastrointestinal tract disease and probiotics. **Asian Pacific Journal of Clinical Nutrition** 5: 31-35.

- (143) Kabir, A.M.A., Aiba, Y., Takagi, A., Kamiya, S., Miwi, T., and Koga, Y. 1997. Prevention of *Helicobacter pylori* infection by lactobacilli in a gnotobiotic murine model. **Gut** 41: 49-55.
- (144) Michetti, P., Dorta, G., Brassart, D., and Vouillamoz, D. 1995. *Lactobacillus acidophilus* supernatant as an adjuvant in the therapy of *Helicobacter pylori* in humans. **Gastroenterology** 108: 253-258.
- (145) Macpherson, A., et al. 1996. Mucosal antibodies in inflammatory bowel disease are directed against intestinal bacteria. **Gut** 38: 365-375.
- (146) Pirzer, U., et al. 1991. Reactivity of infiltrating T lymphocytes with microbial antigens in Crohn's disease. **Lancet** 338: 1238-1239.
- (147) Andus, T., et al. 2002. Toll-like receptors 2 and 4 are up-regulated during intestinal inflammation. **Gastroenterology** 122: 1987-2000.
- (148) Borrueal, N., et al. 2002. Increased mucosal TNF- $\alpha$  production in Crohn's disease can be downregulated ex vivo by probiotic bacteria. **Gut** 51: 659-664.
- (149) Borrueal, N., et al. 2003. Effects of nonpathogenic bacteria on cytokine secretion by human intestinal mucosa. **Am J Gastroenterol** 98: 865-870.
- (150) Madsen, K., et al. 2001. Probiotic bacteria enhance murine and human intestinal epithelial barrier function. **Gastroenterology** 121: 580-591.
- (151) Schultz, M., et al. 2002. *Lactobacillus plantarum* 299V in the treatment and prevention of spontaneous colitis in interleukin-10-deficient mice. **Inflamm Bowel Dis** 8: 71-80.

- (152) Zoumpopoulou, G., et al. 2008. *Lactobacillus fermentum* ACA-DC 179 displays probiotic potential in vitro and protects against trinitrobenzene sulfonic acid (TNBS)-induced colitis and Salmonella infection in murine models. **Int J Food Microbiol** 121: 18-26.
- (153) Steidler, L., et al. 2000. Treatment of murine colitis by *Lactobacillus lactis* secreting interleukin-10. **Science** 289: 1352-1355.
- (154) Hanauer, S.B., et al. 2002. Maintenance infliximab for Crohn's disease: the Accent I randomised trial. **Lancet** 359: 1541-1549.
- (155) Guandalini, S. 2002. Use of *Lactobacillus*-GG in paediatric Crohn's disease. **Dig Liver Dis** 34, (Suppl 2): S63-S65.
- (156) Rembacken, B.J., Snelling, A.M., Hawkey, P.M., Chalmers, D.M., Axonm A.T. 1999. Non-pathogenic *Escherichia coli* versus mesalazine for the treatment of ulcerative colitis: a randomised trial. **Lancet** 354: 635-639.
- (157) Gionchetti, P., et al. 2000. Oral bacteriotherapy as maintenance treatment in patients with chronic pouchitis: a double-blind, placebo controlled trial. **Gastroenterology** 119: 305-309.
- (158) Biogaia Biologics, Inc/Texas Children Hospital. 2006. Workshop on Methods for *Lactobacillus reuteri* detection, enumeration, and isolation. pp.1-8.
- (159) Jacobson, C.N., et al. 1999. Screening of probiotic activities of forty-seven strains of *Lactobacillus* spp. by in vitro techniques and evaluation of the colonization ability of five selected strains in humans. **Appl Environ Microbiol** 65: 4949-4956.

- (160) Reinheimer, J.A., Denkow, M.R., Condioti, M.C. 1990. Inhibition of coliform bacteria by lactic acid bacteria. **Aust J Dairy Technol** 45: 5-9.
- (161) Tamura, K., Dudley, J., Nei, M., and Kumar, S. 2007. MEGA4: Molecular Evolutionary Genetics Analysis (MEGA) software version 4.0. **Molecular Biology and Evolution** 24: 1596-1599.
- (162) Thompson, J.D., Higgins, D.G., and Gibson, T.J. 1994. CLUSTAL W: improving the sensitivity of progressive multiple sequence alignment through sequence weighting, position-specific gap penalties and weight matrix choice. **Nucleic Acids Res** 22: 4673-4680.
- (163) Grahn, N., Olofsson, M., Ellnebo-Svedlund, K., Monstein, H.-J., and Jonasson, J. 2003. Identification of mixed bacterial DNA contamination in broad-range PCR amplification of 16S rDNA V1 and V3 variable regions by pyrosequencing of cloned amplicons. **FEMS Microbiol Lett** 14: 89-91.
- (164) Jonasson, J., Olofsson, M., and Monstein, H.-J. 2002. Classification, identification, and subtyping of bacteria based on pyrosequencing and signature matching of 16S rDNA fragments. **APMIS** 110: 263-272.
- (165) Ronaghi, M., Karamohamed, S., Pettersson, B., Uhlen, M., and Nyren, P. 1996. Real-time DNA sequencing using detection of pyrophosphate release. **Anal Biochem** 242(1): 84-89.
- (166) Pyrosequencing for *Lactobacillus* Identification. 2005. Texas Children's Hospital. Pathology and Molecular Microbiology: Department. Texas, USA. P1-8.

- (167) Versalovic, J., Koeuth, T., and Lupski, J.R. 1991. Distribution of repetitive DNA sequences in eubacteria and application to fingerprinting of bacteria genomes. **Nucleic Acids Res** 19: 6823-6831.
- (168) Versalovic, J., et al. 1993. Penicillin-resistant *Streptococcus pneumoniae* strains recovered in Houston: identification and molecular characterization of multiple clones. **J Infect Dis** 167: 850-856.
- (169) Koeuth, T., Versalovic, J., and Lupski, J.R. 1995. Differential subsequence conservation of interspersed repetitive *Streptococcus pneumoniae* BOX elements in diverse bacteria. **Genome Res** 5: 408-418.
- (170) Versalovic, J., and Lupski, J.R. 2002. Molecular detection and genotyping of pathogens: more accurate and rapid answers. **Trends Microbiol** 10: S15-S21.
- (171) Healy, M., et al. 2005. Microbial DNA typing by automated repetitive-sequence-based PCR. **J Clin Microbiol** 43: 199-207.
- (172) Versalovic, J., et al. 1995. DNA fingerprinting of pathogenic bacteria by fluorophore-enhanced repetitive sequence-based polymerase chain reaction. **Arch Pathol Lab Med** 119: 23-29.
- (173) Chen, H., and Hoover, D.G. 2003. Bacteriocins and their food applications. **Comprehensive reviews in food science and food safety** 2: 83-100.
- (174) Tuomola, E., Crittenden, R., Playne, M., Isolauri, E., and Salminen, S. 2001. Quality assurance criteria for probiotic bacteria. **Am J Clin Nutr** 73 (suppl): 393S-398S.

- (175) Lin, W.-H., Yu, B., Jang, S.-H., Tsen, H.-Y. 2007. Different probiotic properties for *Lactobacillus fermentum* strains isolated from swine and poultry. **Anaerobe** 12: 107-113.
- (176) Vignolo, G.M., Suriani, F., Holdago, A.P.D.R., Oliver, G. 1993. Antibacterial activity of *Lactobacillus* strains isolated from dry fermented sausages. **J Appl Bacteriol** 75: 344-349.
- (177) Jiménez-Díaz, R., Ríos-Sánchez, R.M., Desmazeaud, M., Ruiz-Barba, J.L., and Piard, J.C. 1993. Plantaricin S and T, two new bacteriocins produced by *Lactobacillus plantarum* LPCO10 isolated from a green olive fermentation. **Applied Environ Microbiol** 59: 1416-1424.
- (178) van Reenen, C.A., Dicks, L.M.T., and Chikindas, M.L. 1998. Isolation purification and partial characterization of plantaricin 423, a bacteriocin produced by *Lactobacillus plantarum*. **J Appl Microbiol** 84: 1131-1137.
- (179) Kanatani, K., Oshimura, M., Sano, K. 1995. Isolation and characterization of acidocin A and cloning of the bacteriocin gene from *Lactobacillus acidophilus*. **Appl Environ Microbiol** 61: 1061-1067.
- (180) Ferchichi, M., Frère, J., Mabrouk, K., Manai, M. 2001. Lactococcin MMFII, a novel class IIa bacteriocin produced by *Lactococcus lactis* MMFII, isolated from a Tunisian dairy product. **FEMS Microbiol Lett** 205: 49-55.



- (181) Mante, S., Sakyi-Dawson, E., Amoa-Amoa-Awua, W.K. 2003. Antimicrobial interactions of microbial species involved in the fermentation of cassava dough into agbelina with particular reference to the inhibitory effect of lactic acid bacteria on enteric pathogens. **Int J Food Microbiol** 89: 41-50.
- (182) Millette, M., Luquet, F.M., and Lacroix, M. 2007. In vitro growth control of selected pathogens by *Lactobacillus acidophilus* and *Lactobacillus casei*-fermented milk. **Lett Appl Microbiol** 44: 314-319.
- (183) Kandler, O., Setter, K., and Kohl, R. 1980. *Lactobacillus reuteri* sp. nov., a new species of heterofermentative lactobacilli. **Zentralbl Bakteriol Mikrobiol Hyg Abt 1 Orig. C1**: 264-269.
- (184) Chen, G., and Goeddel, D.V. 2002. TNF-R1 signaling: A beautiful pathway. **Science** 296: 1634-1635.
- (185) Guarner, F., et al. 2006. Mechanism of disease: the hygiene hypothesis revisited. **Nature clinical practice gastroenterology and hepatology** 3: 275-284.
- (186) Menard, S., Candalh, C., Bambou, C., Terpend, K., Cerf-Bensussan, N., and Heyman, M. 2004. Lactic acid bacteria secrete metabolites retaining anti-inflammatory properties after intestinal transport. **Gut** 53: 821-828.
- (187) Schultz, M., Scholmerich, J., and Rath, H.C. 2003. Rationale for probiotics and antibiotic treatment strategies in inflammatory bowel diseases. **Dig Dis** 21: 105-128.

- (188) Tien, M.T., et al. 2006. Anti-inflammatory effect of *Lactobacillus casei* on *Shigella*-infected human intestinal epithelial cells. **J of Immunol** 176: 1228-1237.
- (189) Wildt, S., et al. 2006. Probiotics treatment of Collagenous colitis: a randomized, double-blind, placebo-controlled trial with *Lactobacillus acidophilus* and *Bifidobacterium animalis* sub sp *Lactis*. **Inflamm Bowel Dis** 12: 395-401.
- (190) Guandalini, S. 2002. Use of *Lactobacillus*-GG in pediatric Crohn's disease. **Dig Liver Dis** 43: S63-S65.
- (191) Bibiloni, et al. 2005. VSL#3 probiotic-mixture induces remission in patients with active ulcerative colitis. **Am J Gastroenterol** 100: 1539-1546.
- (192) Talaro, K.P., and Talaro, A. 2002. **Foundations in Microbiology** 4<sup>th</sup> ed. New York: McGraw-Hill.
- (193) Aikawa, Y., Yamamoto, M., Yamamoto, T., Morimoto, K., and Tanaka, K. 2002. An anti-rheumatic agent T-614 inhibits NF- $\kappa$ B activation in LPS-and TNF- $\alpha$ -stimulated THP-1 cells without interfering with I $\kappa$ B $\alpha$  degradation. **Inflamm Res** 51: 188-194.
- (194) David, L., et al. 2002. Basic science review recent advances in understanding NF- $\kappa$ B regulation. **Inflammatory Bowel Diseases** 8(3): 201-212.
- (195) Elewaut, D. et al. 1999. NF-kappa B is a central regulator of the intestinal epithelial cell innate immune response induced by infection with enteroinvasive bacteria. **J Immunol** 163: 1457-1466.

- (196) Egan, L.J., and Toruner, M. 2006. NF- $\kappa$ B signaling Pros and Cons of altering NF- $\kappa$ B as a therapeutic approach. **Annals New York Academy of Science** 1072: 114-122.
- (197) Bai, A.P, Quyang, Q., Zhang, W., Wang, C., and Li, S. 2004. Probiotics inhibit TNF- $\alpha$  induced interleukin-8 secretion of HT29 cells. **World J Gastroenterol** 10: 455-457.
- (198) Kim, S.O., Sheikh, H.I., Ha, S.-D., Martins, A., and Reid, G. 2006. G-CSF-mediated inhibition of JNK is a key mechanism for *Lactobacillus rhamnosus* -induced suppression of TNF production in macrophages. **Cellular Microbiology** 8 (12): 1958–1971.
- (199) Lin, Y.P., Thibodeaux, C.H., Peña, J.A., Ferry, G.D. , and Versalovic, J. 2008. Probiotic *Lactobacillus reuteri* suppress proinflammatory cytokine via c-Jun. **Inflamm Bowel Dis** (Epub ahead of print).
- (200) Ma, D., Forsythe, P., and Bienenstock, J. 2004. Live *Lactobacillus reuteri* is essential for the inhibitory effect on tumor necrosis factor alpha-induced interleukin-8 expression. **Infect Immun** 72: 5308-5314.
- (201) Iyer, C., Kusters, A., Sethi, G., Kunnumakkara, A.B., Aggarwal, B.B., and Versalovic, J. 2008. Probiotic *Lactobacillus reuteri* promotes TNF-induced apoptosis in human myeloid leukemia-derived cells by modulation of NF- $\kappa$ B and MAPK signaling. **Cell Microbiol** (Epub ahead of print).
- (202) Papadakis, K.A., and Targan, S.R. 2000. Tumor necrosis factor: Biology and therapeutic inhibitors. **Gastroenterology** 119: 1148-1157.

- (203) Watkins, L.R., Hansen, M.K., Nguyne, K.T., Lee, J.E., Maier, S.F. 1999. Dynamic regulation of the proinflammatory cytokine, interleukin-1 beta. **Life Sci** 65: 449-481.
- (204) Tsai, E.Y., et al. 2000. A lipopolysaccharide-specific enhancer complex involving Ets, Elk-1, Sp1 and CREB binding protein and p300 is recruited to the tumor necrosis factor alpha promoter *in vivo*. **Mol Cell Biol** 20: 6084-6094.
- (205) Yao, J., Mackman, N., Edgington, T.S., Fan, S.T. 1997. Lipopolysaccharide induction of the tumor necrosis factor alpha promoter in human monocytic cells. Regulation by egr-1, c-jun and NF-k beta transcription factors. **J Biol Chem** 272: 17795-17801.
- (206) Means, T.K., Pavlovich, R.P., Roca, D., Vermeulen, M.W., Fenton, M.J. 2000. Activation of TNF-alpha transcription utilizes distinct MAP kinase pathways in different macrophage populations. **J Leukocyte Biol** 67: 885-893.
- (207) Kishore, R., McMullen, M.R., Cocuzzi, E., and Nagy, L.E. 2004. Lipopolysaccharide-mediated signal transduction: Stabilization of TNF-alpha mRNA contributes to increased lipopolysaccharide-stimulated TNF-alpha production by Kupffer cells after chronic ethanol feeding. **Comparative Hepatology** 3(Suppl 1): S31
- (208) Hyronimus, B., Le Marrec, C., Hadj Sassi, A., and Deschamps, A. 2000. Acid and bile tolerance of spore-forming lactic acid bacteria. **International Journal of Food Microbiology** 61: 193-197.

- (209) Pennacchia, C. et al. 2004. Selection of *Lactobacillus* strains from fermented sausages for their potential use as probiotics. **Meat Science** 67: 309-317.
- (210) Erkkila, S., and Petaja, E. 2000. Screening of commercial meat starter cultures at low pH and in the presence of bile salts for potential probiotic use. **Meat Science** 55: 297-300.
- (211) Prasad, J., Gill, H., Smart, J., and Gopal, P. K. 1998. Selection and characterisation of *Lactobacillus* and *Bifidobacterium* strains for use as probiotics. **International Dairy Journal** 8: 993-1002.
- (212) Xanthopoulos, V., Litopoulou-Tzanetaki, E., and Tzanetakis, N. 2000. Characterization of *Lactobacillus* isolates from infant faeces as dietary adjuncts. **Food Microbiology** 17: 205-215.
- (213) Gilliland, S. E., Staley, T. E., and Bush, L. J. 1984. Importance of bile tolerance of *Lactobacillus acidophilus* used as a dietary adjunct. **Journal of Dairy Science** 67: 3045-3051.
- (214) Nigatu, A. 2000. Evaluation of numerical analyses of RAPD and API 50 CH patterns to differentiate *Lactobacillus plantarum*, *Lact. fermentum*, *Lact. rhamnosus*, *Lact. sake*, *Lact. parabuchneri*, *Lact. gallinarum*, *Lact. casei*, *Weissella minor* and related taxa isolated from kocho and teff. **J Appl Microbiol** 89: 969-978.
- (215) Jill, E., Clarridge III. 2004. Impact of 16S rRNA gene sequence analysis for Identification of bacteria on clinical microbiology and infectious diseases. **Clinical Microbiology Reviews** 47: 840-862.

- (216) Fournier, P. E., et al. 2003. Gene sequence-based criteria for identification of new *Rickettsia* isolates and description of *Rickettsia heilongjiangensis* sp. nov. **J Clin Microbiol** 41: 5456-5465.
- (217) Harmsen, D., and Karch, H. 2004. 16S rDNA for diagnosing pathogens: a living tree. **ASM News** 70: 19-24.
- (218) Song, Y., et al. 2003. *Clostridium bolteae* sp. nov., isolated from human sources. **Syst Appl Microbiol** 26: 84-89.
- (219) Tannock, G.W., et al. 1999. Identification of *Lactobacillus* isolates from the gastrointestinal tract, silage, and yoghurt by 16S-23S rRNA gene intergenic spacer region sequence comparisons. **Applied and Environmental Microbiology** 65: 4264-4267.
- (220) Karlsson, A.O., and Holmlund, G. 2007. Identification of mammal species using species-specific DNA pyrosequencing. **Forensic Science International** 173: 16-20.
- (221) Curk, M.C., Hubert, J.C., and Bringel, F. 1996. *Lactobacillus paraplantarum* sp. nov., a new species related to *Lactobacillus plantarum*. **Int J Syst Bacteriol** 46: 595-598.
- (222) Pedersen, C., and Roos, S. 2004. *Lactobacillus saerimneri* sp. nov., isolated from pig faeces. **Int J of Syst and Evol Microbiol** 54: 1365-1368.
- (223) Versalovic, J., and Relman, D. 2006. How bacterial communicates expand functional repertoires. **Plos Biology** 4: 2193-2195.
- (224) Olive, D.M., and Bean, P. 1999. Principles and application of methods for DNA-based typing of microbial organisms. **J Clin Microbiol** 37: 1661-1669.

- (225) Vila, J., Marcos, M.A., and Jimenez de Anta, M.T. 1996. A comparative study of different PCR-based DNA fingerprinting techniques for typing of the *Acinetobacter calcoaceticus*-*A. baumannii* complex. **J Med Microbiol** 44: 482-489.
- (226) Woods, C.R., Versalovic, J., Koeuth, T., and Lupski, J.R. 1992. Analysis of relationships among isolates of *Citrobacter diversus* by using DNA fingerprinting generated by repetitive sequence-based primers in polymerase chain reaction. **J Clin Microbiol** 30: 2921-2929.
- (227) Clarridge, J.E., et al. 1995. Strategy to detect and identify *Bartonella* species in routine clinical laboratory yields *Bartonella henselae* from human immunodeficiency virus-positive patient and unique *Bartonella* strain from his cat. **J Clin Microbiol** 33: 2107-2113.
- (228) Barbier, N., Saulnier, P., Chachaty, E., and Andremont. 1996. Random amplified polymorphic DNA typing versus pulsed-field gel electrophoresis for epidemiological typing of vancomycin-resistant enterococci. **J Clin Microbiol** 34: 106-109.
- (229) Liu, P.Y.-F., and Wu, L. 1997. Use of different PCR-based DNA fingerprinting techniques and pulsed-field gel electrophoresis to investigate the epidemiology of *Acinetobacter calcoaceticus*-*Acinetobacter baumannii* complex. **Diag Microbiol** 28: 19-28.
- (230) Bouton, Y., Guyot, P., Beuvier, E. Tailliez, P., and Grappin, R. 2002. Use of PCR-based methods and PFGE for typing and monitoring homofermentative lactobacilli during Comte cheese ripening. **Int J Food Microbiol** 76: 27-38.

- (231) Gevers, D., Huys, G., and Swings, J. 2001. Applicability of rep-PCR fingerprinting for identification of *Lactobacillus* species. **FEMS Microbiol Lett** 205: 31–36.
- (232) Ventura, M., and Zink, R. 2002. Specific identification and molecular typing analysis of *Lactobacillus johnsonii* by using PCR-based methods and pulsed field gel electrophoresis. **FEMS Microbiol Lett** 217: 141–154.



## APPENDICES

**APPENDIX A****MATERIALS AND EQUIPMENTS****1. Materials**

- MRS agar (Becton Dickinson, USA)
- Vancomycin disks (5 µg; Becton Dickinson, USA)
- Gas package (BBL, Becton Dickinson, USA)
- Cell lines: THP-1 monocytic cells (TIB 202)
- Conical tube: 15, 50 ml (Corning, USA)
- Sterile serological pipettes: 1, 2, 5, 10, 25 ml (VWR, USA)
- Filter paper 0.22 µm (Millipore, USA)
- Tissue culture flask: 25, 75 cm<sup>2</sup> (Corning, USA)
- Tissue culture plate: 12, 96-well plate (Falcon BD, USA)
- Fetal bovine serum (Gibco-Invitrogen, USA)
- RPMI 1640 (Gibco-Invitrogen, USA)
- Hemocytometer (Hausser Scientific, USA)
- Counter (Fisher Scientific, USA)
- Cryovial (Nalgene, USA)
- ELISA plate: 96-well plate: Immunolon 2 HB (Thermo, USA)
- Recombinant human TNF-α (R&D Systems, USA)
- GeneAmp dNTPs (Applied Biosystem, USA)
- Nuclear Extract Kit (Active Motif, USA)
- BCA™ Protein Assay Kit (Pierce, USA)
- NF-κB p65 Transcription Factor Assay Kits (Active Motif, USA)

Genomic DNA Purification Kit (Promega, USA)  
QAIGEN MinElute PCR Purification Kit (Qiagen, USA)  
Amplitaq Gold LD DNA polymerase (Applied Biosystem, USA)  
DiversiLab *Lactobacillus* kit (Spectral Genomics, USA)  
DNA LabChip® device (LabChip device; Caliper Technologies, USA)  
DiversiLab DNA chip reagents (Spectral Genomics, USA)

## 2. Equipments

Microcentrifuge (Eppendorf, USA)  
Refrigerated centrifuge (Sorval, USA)  
Centrifuge (IEC, USA)  
-20°C Freezer (VWR, USA)  
-80°C Freezer (Revco, USA)  
Light microscope (Nikon, Japan)  
Inverted microscope: Nikon eclipse TS100 (Nikon, Japan)  
Thermal cycler: GeneAmp PCR system 2700 (Applied Biosystem, USA)  
Pipettes: P-2, P-10, P-200, P-1000 (Gilson, France)  
Frogger (DAN-KAR CCRP, USA)  
Multi-channel (Rainan, USA)  
CO<sub>2</sub> humidified incubator (VWR, USA)  
Safety cabinet (The baker company, USA)  
Water bath 37°C (Fisher Scientific, USA)  
Speed vac DNA (Savant Instruments, USA)  
Power supply (BioRad, USA)

Electrophoresis apparatus (ISC Bioexpress, USA)

Spectrophotometer: SmartSpec 3000 (BioRad, USA)

Water bath (VWR, USA)

Anaerobic chamber (Envimed, England)

37°C Incubator (VWR, USA)

Microfluidics chips (LabChip device; Caliper Technologies, USA)

Bioanalyzer B 2100 (Agilent Technologies, USA.)

Spectramax 340PC (Molecular Devices Corporation, USA)

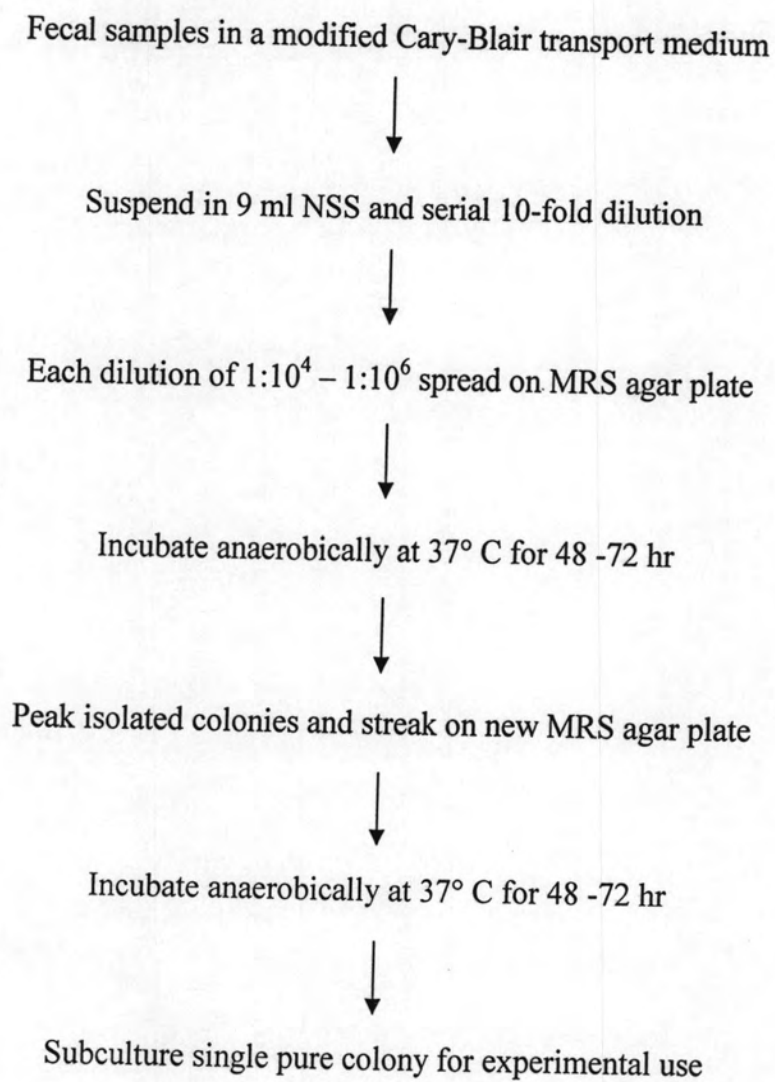
### **3. Software and Program**

Sequence match program at the Ribosomal Database Project II

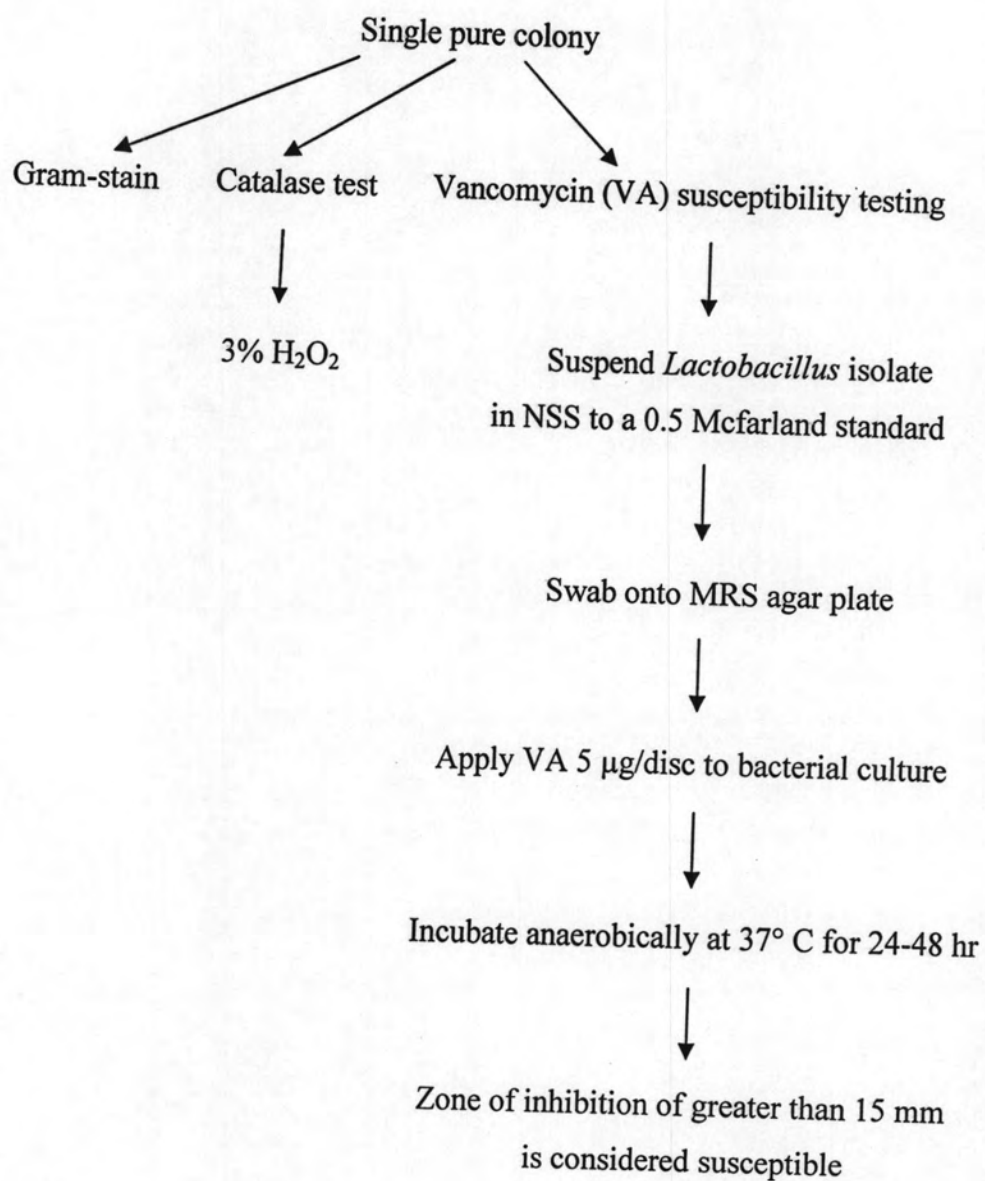
(<http://rdp.cme.msu.edu/html>)

MEGA version 4.0

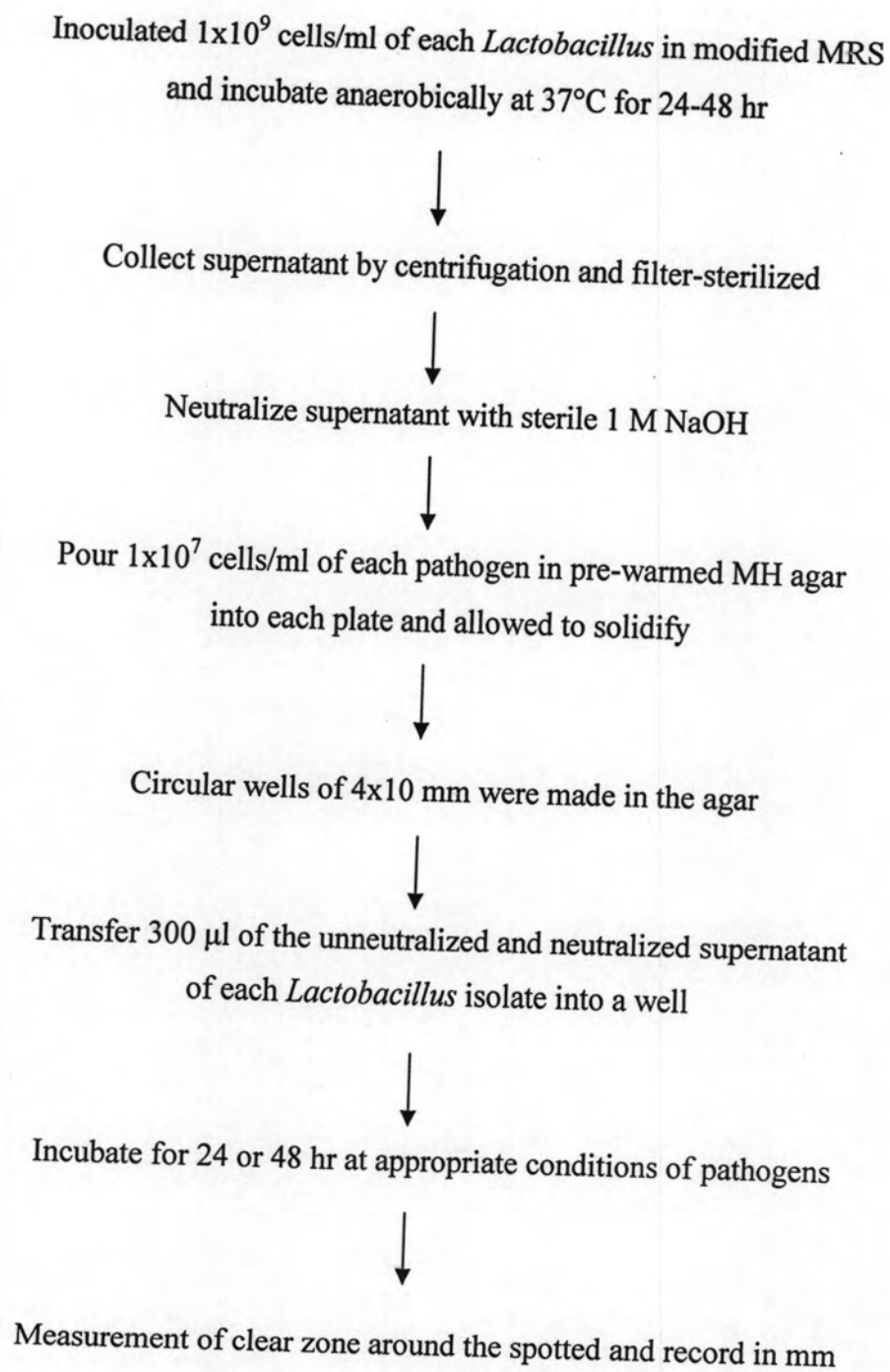
DiversiLab software version 3.3 (<http://tch.diversilab.com>)

**APPENDIX B****FLOW CHART OF PROTOCOL****1. Isolation of Lactobacilli from Human Feces**

## 2. Presumptive Test of *Lactobacillus* Isolates



### 3. Assessment of Antagonistic Activity by Agar Well Diffusion Assay



#### 4. Overlay Technique for the Detection of Reuterin

Inoculate each *Lactobacillus* strain in 200  $\mu$ l MRS broth  
in each well of 96-well plate, incubate anaerobically at 37°C for 24-48 hr



Using Frogger, transfer of each culture into 175  $\mu$ l MRS broth  
in each well of 96-well plate, incubate anaerobically at 37°C for 24 hr



Using Frogger, spot each culture onto BHI 20 mM glucose in 150 mm plate  
Incubate anaerobically at 37°C for 24 hr



Add 30 mL of 1% soft agar with 2% glycerol over the plate  
anaerobically at 37°C for 1 hr



Remove the plates and flood the surface with 25 ml of DNPH solution



Wait 5 minutes and discard the DNPH solution



Add 25 ml KOH solution and watch for reddish brown color  
to develop around the Reuterin producing strain



## 5. Assessment of Antagonistic Activity by Spot Overlay Method

Inoculate each *Lactobacillus* strain in 200  $\mu$ l MRS broth in each well of 96-well plate, incubate anaerobically at 37°C for 24-48 hr



Using Frogger, transfer of each culture into 175  $\mu$ l MRS broth in each well of 96-well plate, incubate anaerobically at 37°C for 24 hr



Using Frogger, spot each culture onto BHI 20 mM glucose in 150 mm plate incubate anaerobically at 37°C for 24 hr



Add 25 ml of pathogen  $10^6$  cells/ml in BHI 0.7 %soft agar with 2% glycerol over the plate, incubate anaerobically at 37°C for 1 hr

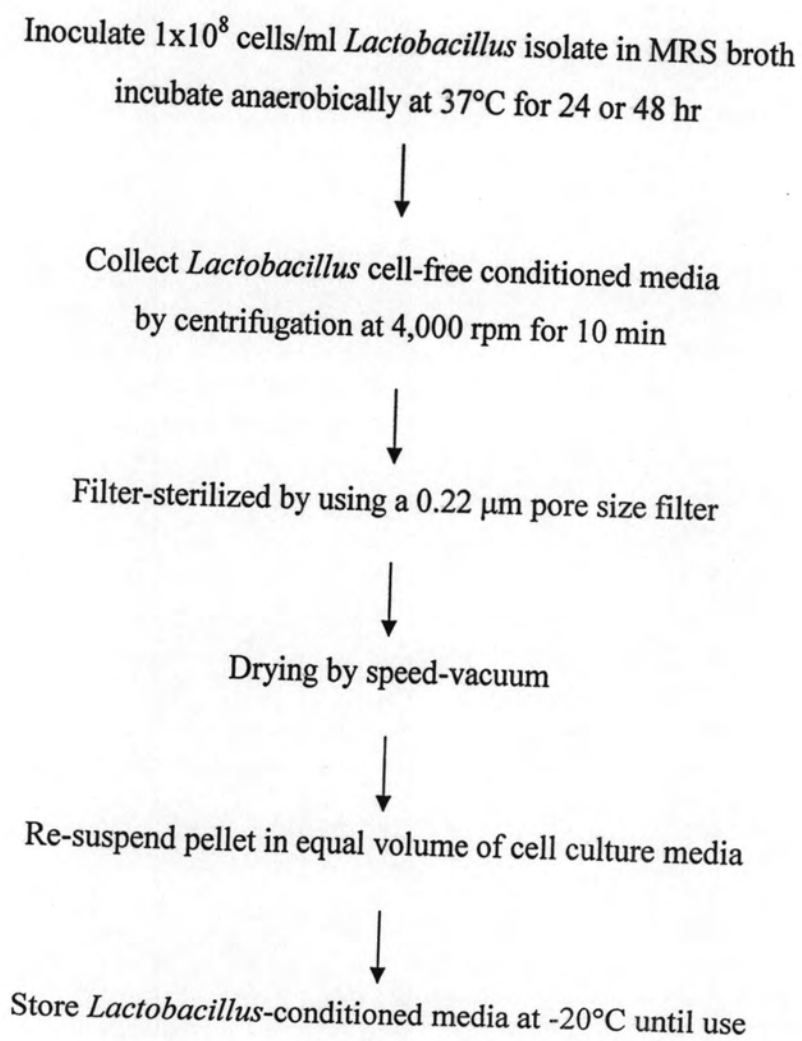


Remove the plates and incubate aerobically at 37°C O/N



Measurement of clear zone around the spotted and record in mm

## 6. Preparation of *Lactobacillus* Conditioned Media (LCM)



## 7. Bioassay for modulation of TNF- $\alpha$ production

Plate 200  $\mu$ l of  $2.5 \times 10^5$  cells/ml THP-1 cells into each well of a 96-well plate



Add 10  $\mu$ l (5% v/v) of *Lactobacillus* conditioned media into appropriate wells



Add 5  $\mu$ l (final conc. 100 ng/ml) of *E. coli* LPS (serotype O127:B8, Sigma) into appropriate wells



Incubate at 37°C, CO<sub>2</sub> incubator for 3.5 hours

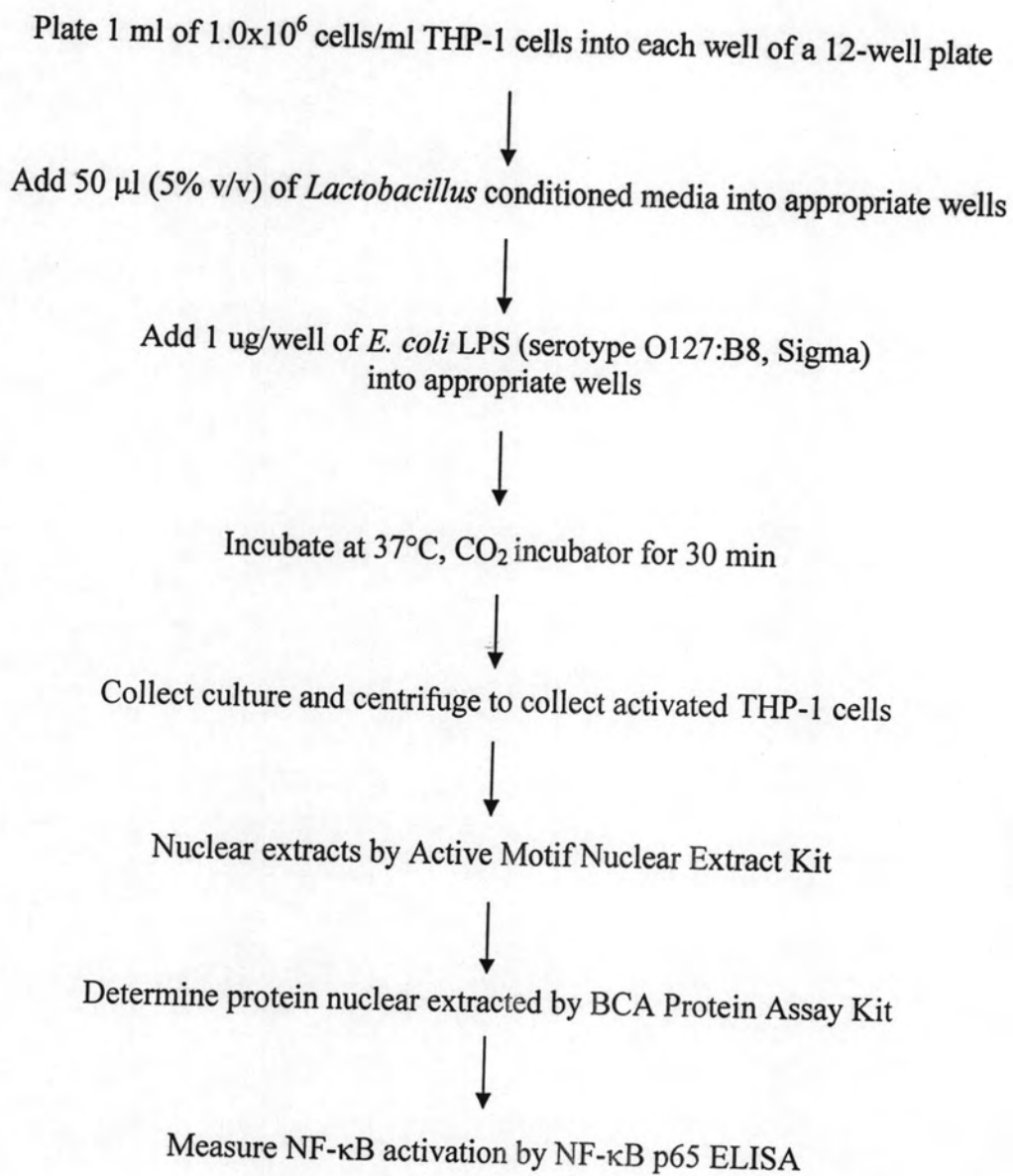


Collect culture and centrifuge to collect supernatants



Test for cytokine secretion by TNF- $\alpha$  sandwich ELISA

## 8. Bioassay for Assessment of NF- $\kappa$ B Activation



## APPENDIX C

## PREPARATION OF MEDIA

## 1. Modified MRS Broth (MMRS)

Glucose	2.0	gm
Yeast extract	5.0	gm
Peptone	10	gm
Beef extract	10	gm
Sodium acetate	5.0	gm
Trisodiumcitrate dihydrate	12.9	gm
Tween 80	1.0	ml
Magnesium sulfate	0.2	gm
Manganese sulfate	0.05	gm
Dipotassium phosphate	2.0	gm
Distilled water to	1,000	ml
Adjust pH to 6.5±0.2		
Autoclave at 121°C for 15 minutes		

## 2. Modified Cary-Blair Transport Medium

Agar	5.0	gm
Sodium chloride	5.0	gm
Sodium thioglycolate	1.5	gm
L-cysteine.HCl.H <sub>2</sub> O	0.5	gm
Calcium chloride	0.1	gm
Disodium phosphate	0.1	gm
Sodium disulfite	0.1	gm
Resagurin solution	4.0	ml
Distilled water to	1,000	ml
Adjust pH to 8.4±0.2		
Autoclave at 121°C for 15 minutes		

## BIOGRAPHY

Mrs. Malai Taweechotipatr was born on August 31, 1966 in Mahasarakham, Thailand. She graduated with the Bachelor degree of Science in Zoology from the Faculty of Science, Chulalongkorn University in 1989. She got Master degree of Science in Medical Microbiology from the Graduate School of the same University in 1996. She is currently working as an instructor at the Department of Microbiology, Faculty of Medicine, Srinakharinwirot University, Bangkok, Thailand.

