

## เอกสารอ้างอิง

กนกพร บุญเพื่อน, ศศิธร สุวรรณภูมิชัย, ภาวิณี คณาสวัสดิ์ และ สุรีย์ พุตระกูล. 2534. การหาลักษณะเฉพาะของท่อร์มอฟลิกแบคทีเรียสามชนิดที่ผลิตไอลเปสที่แยกได้จากแหล่งท้องถิ่น. ภาควิชาเคมี คณะวิทยาศาสตร์ มหาวิทยาลัยเชียงใหม่.

กิตติเดช สุวรรณสนธิชัย. 2532. การคัดเลือกแบคทีเรียจากดินเพื่อผลิตไอลเปสและศึกษาปัจจัยที่เหมาะสมต่อการผลิต. วิทยานิพนธ์วิทยาศาสตร์มหบันฑิต สาขาวิชาจุลชีววิทยามหาวิทยาลัยเกษตรศาสตร์.

ชุรีรัตน์ แซ่ดดี้. 2541. การคัดเลือกและศึกษาสภาพที่เหมาะสมต่อการผลิตไอลเปสจากแบคทีเรียขอบอุณหภูมิสูงที่แยกได้จากโรงงานสกัดน้ำมันปาล์ม. วิทยานิพนธ์วิทยาศาสตร์มหบันฑิต สาขาวิชาเทคโนโลยีชีวภาพ มหาวิทยาลัยสงขลานครินทร์.

นิศารัตน์ ดำเนียร. 2540. สมบัติของเอนไซม์ Cyclodextrin Glycosyltransferase (CGTase) ที่ผลิตจากแบคทีเรียนค่าง *Bacillus* sp. PS304 และสูตรอาหารเลี้ยงเชื้อที่เหมาะสม. วิทยานิพนธ์วิทยาศาสตร์มหบันฑิต สาขาวิชาชีววิทยาศาสตร์ชีวภาพ มหาวิทยาลัยสงขลานครินทร์.

พงศ์ชาริน โล่ห์ตระกูล. 2538. การผลิต การทำให้บริสุทธิ์ และศึกษาลักษณะของเอนไซม์ไอลเปสจากเชื้อ *Aeromonas sobria*สายพันธุ์ LP004. วิทยานิพนธ์วิทยาศาสตร์มหบันฑิต สาขาวิชาเทคโนโลยีชีวภาพ มหาวิทยาลัยมหิดล.

วิลาวัณย์ เจริญจิระตระกูล. 2539. จุลินทรีย์ที่มีความสำคัญด้านอาหาร. ภาควิชาชีววิทยา คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์.

วิภูมิ แก้วทอง. 2539. การคัดเลือกและการศึกษาสภาพที่เหมาะสมต่อการผลิตไอลเปสจากแบคทีเรียขอบค่าง. วิทยานิพนธ์วิทยาศาสตร์มหบันฑิต สาขาวิชาเทคโนโลยีชีวภาพ มหาวิทยาลัยสงขลานครินทร์.

สมรักษ์ พันธ์ผล. 2537. การทำให้บริสุทธิ์และคุณสมบัติของเอนไซม์เซลลูเลสและไฉไลจาก *Aspergillus niger* ATCC 6275. วิทยานิพนธ์วิทยาศาสตร์มหบันฑิต สาขาวิชาเทคโนโลยีชีวภาพ มหาวิทยาลัยสงขลานครินทร์.

ອາກີສສຣາ ຈມືດທີ່ 2535. ເຖິງນິຄອເລັກໂທຣ ໂພຣີຈິສ. ຄະນະສັດວແພທຍໍາສາສຕ່າ ມາວິທຍາລ້ຽມ  
ເກມທຣສາສຕ່າ. ຮູ່ວເປີຍວ.

- Abramic, M., Lescic, I., Korica, T., Vitale, L., Saenger, W. and Pigac, J. 1999.  
Purification and properties of extracellular lipase from *Streptomyces rimosus*.  
Enzyme Microb. Technol. 25:522-529.
- Balcao, V.M., Paiva, A.L. and Malcata, F.X. (1996) Bioreactors with immobilized lipase : state of the art. Enzyme Microb. Technol. 18:392-416.
- Becker, P., Abu-Reesh, I., Markossian, S., Antranikian, G. and Markl, H. 1997.  
Determination of the kinetic parameters during continuous cultivation of the lipase-producing thermophile *Bacillus* sp. IHI-91 on olive oil. Appl. Microbiol. Biotechnol. 48:184-190.
- Brock, T.D. 1986. Thermophiles : General, Molecular, and Applied Microbiology. John Wiley and Sons, Inc : New York.
- Chen, J.P. 1996. Production of Ethyl butyrate using gel-entrapped *Candida cylindracea* lipase. J. Ferment. Bioeng. 82(4):404-407.
- Chartrain, M., Katz, L., Marcin, C., Thien, M., Smith, S., Fisher, E., Goklen, K., Salmon, P., Brix, T., Price, K. and Greasham, R. 1993. Purification and characterization of a novel bioconverting lipase from *Pseudomonas aeruginosa* MB5001. Enzyme Microb. Technol. 15:575-580.
- Christner, J., Pfeiderer, E. and Taeger, T. 1991. Enzyme-Aided Soaking Process for Skins and Hides, United Kingdom Patent 2233665.
- Colburn, J.T. 1969. Lipase-Treated Milk Fats in Production of Butter/Margarine Flavors, United States Patent 3477857.
- Dartois, V., Coppee, J.Y., Colson, C. and Baulard, A. 1994. Genetic analysis and overexpression of lipolytic activity in *Bacillus subtilis*. Appl. Environ. Microbiol. 60(5):1670-1673.

- Davis, B.J. 1964. Disc electrophoresis methods and application to human serum protein. Ann. NY. Acad. Sci. 121:404-427.
- Dharmsthit, S., Pratuangdejkul, J., Theeragool, G. and Luchai, S. 1998. Lipase activity and gene cloning of *Acinetobacter calcoaceticus* LP009. J. Gen. Appl. Microbiol. 44:139-145.
- Dharmsthit, S. and Luchai, S. 1999. Production, purification and characterization of thermophilic lipase from *Bacillus* sp. THL027. FEMS Microbiol letters. 179:241-246.
- Ergan, F., Trani, M. and Andre, G. 1990. Production of glycerides from glycerol and fatty acid by immobilized lipase in non-aqueous media. Biotechnol. Bioeng. 35:195-200.
- Figurin, Y.V., Shestakova, I.S., Mironova, T.F., Shtein, I.V. and Arends, I.M. 1990. Method of Processing Hides and Skins, Union of the Soviet Socialists Republic Patent 1567634.
- Fogarty, W.M. 1983. Microbial Enzyme and Biotechnology. Applied Science Publisher : London.
- Freifelder, D. 1987. Microbial genetic. Boston : Iones and Bartet. pp. 485-512.
- Frost, G.M. and Moss, D.A. 1987. Production of enzymes by fermentation In Biotechnology volume 7a Enzyme Technology (ed. J.F. Kennedy) pp. 65-212. New York : VCH Publishers.
- Gandhi, N.N. 1997. Applications of lipase. J. Am. Oil Chem. Soc. 74:621-634.
- Garcia, H.S., Yang, B. and Parkin, K.L. 1995. Contineous reactor for enzymatic glycerolysis of butter oil in the absence of solvent. Food Res. Int. 28:605-609.
- Gerritse, G., Hommes, R.W.J. and Quax, W.J. 1998. Development of a lipase fermentation process that uses a recombinant *Pseudomonas alcaligenes* strain. Appl. Environ. Microbiol. 64(7):2644-2651.

- Gilbert, E.J., Cornish, A. and Jones, C.W. 1991. Purification and properties of extracellular lipase from *Pseudomonas aeruginosa* EF2. *J. Gen. Microbiol.* 137:2223-2229.
- Godfrey, T. and Reichelt, J. 1983. Industrial Enzymology. The Application of Enzyme in Industry. Macmillan Publishers Ltd : England.
- Godtfredsen, S.E. 1993. Lipase. In Enzymes in Food "Processing. 3<sup>rd</sup> ed. (eds. T. Nagodawithana and G. Reed) pp205-219, California : Academic Press.
- Guit, R.P.M., Kloosterman, M., Meindersma, G.W. Mayer, M. and Meijer, E.M. 1991. Lipase kinetics : hydrolysis of triacetin by lipase from *Candida cylindracea* in a hallow-fiber membrane reactor. *Biotechnol. Bioeng.* 38:727-732.
- Gulati, R., Saxena, R.K., Gupta, R., Yadav, R.P. and Davidson, W.S. 1999. Parametric optimisation of *Aspergillus terreus* lipase production and its potential in ester synthesis. *Proc. Biochem.* 35:459-464.
- Handelsman, T. and Shoham, Y. 1994. Production and characterization of an extracellular thermostable lipase from a thermophilic *Bacillus* sp. *J. Gen. Appl. Microbiol.* 40:435-443.
- Hatzinikolaou, D.G., Kourentzi, E., Stamatis, H., Christakopoulos, P., Kolisis, F.N., Kekos, D. and Macris, B.J. 1999. A novel lipolytic activity of *Rhodotorula glutinis* cell : production, partial characterization and application in the synthesis of esters. *J. Biosci Bioeng.* 88(1):53-56.
- Henis, Y. 1987. Survival and dormancy of acteria : Endospores. In Survival and dormancy microorganisms. John wiley & sons. New York. pp. 53-66.
- Hiol, A., Jonzo, M.D., Druet, D. and Comeau, L. 1999. Production, purification and characterization of an extracellular lipase from *Mucor hiemalis f. hiemalis*. *Enzyme Microb Technol.* 25:80-87.

- Hiol, A., Jonzo, M.D., Rugani, N., Druet, D., Sarda, L. and Comeau, L.C. 2000. Purification and characterization of an extracellular lipase from a thermophilic *Rhizopus oryzae* strain isolated from palm fruit. Enzyme Microb Technol. 26:421-430.
- Holmes, D.S. and Quigley, M. 1981. A rapid boiling method for the preparation of bacterial plasmids. Anal. Biochem. 114:193-197.
- Hoq, M.M., Yamane, T., Shimizu, S., Funada, T. and Ishida, S. 1985. Bioreactor for enzymic reaction of fat and fatty acid derivatives III continuous hydrolysis of olive oil by lipase in a microporous hydrophobic membrane reactor. J. Am. Oil Chem. Soc. 62:1016-1021.
- Hoshino, T., Sasaki, T., Watanabe, Y., Nagasawa, T. and Yamane, T. 1992. Purification and some characteristics of extracellular lipase from *Fusarium oxysporum* f. sp. *lini*. Biosci. Biotech. Biochem. 56:660-664.
- Iizumi, T., Nakamura, K. and Fukase, T. 1990. Purification and characterization of a thermostable lipase from newly isolated *Pseudomonas* sp. KWI-56. Agric. Biol. Chem. 54:1253-1258.
- Jaeger, K.E., Ransac, S., Dijkstra, B.W., Colson, C., Heuvel, M.V. and Misset, O. 1994. Bacterial lipases. FEMS Microbiol Reviews. 15:29-63.
- Kamini, N.R., Fujii, T., Kurosu, T. and Iefuji, H. 2000. Production, purification and characterization of an extracellular lipase from the yeast, *Cryptococcus* sp. S-2. Process Biochem. 36:317-324.
- Kaur, J., Ramamurthy, V. and Kothari, R.M. 1993. Characterization of oat lipase for lipolysis of rice bran oil. Biotechnol Lett. 15(3):257-262.
- Ketchum, P.A. 1988. Nutrition, Cultivation, and Growth of Microorganisms. In Microbiology Concepts and Applications. Pp. 148-167. John Wiley and Sons : New York. (1):66-71.

- Khor, H.T., Tan, N.H. and Chua, C.L. 1986. Lipase-catalyzed hydrolysis of palm oil. J. Am. Oil.Chem. Soc. 63:538-540.
- Kim, H.K., Sung, M.H., Kim, H.M. and Oh, T.K. 1994. Occurrence of thermostable lipase in thermophilic *Bacillus* sp. Strain 398. Biosci. Biochem. 58:961-962.
- Kim, H.K., Park, S.Y., Lee, J.K. and Oh, T.K. 1998. Gene cloning and characterization of thermostable lipase from *Bacillus stearothermophilus* L1. Biosci. Biotech. Biochem. 62(1):66-71.
- Klibanov, A.M. 2001. Improving enzymes by using them in organic solvents. Nature. 409:241-246.
- Kokusho, Y., Machida, H. and Iwasaki, S. 1982. Production and properties of alkaline lipase from *Alcaligenes* sp. Strain No. 679. Agri Biol Chem. 46:1743-1750.
- Laemmli, U.K. 1970. Cleavage of structural proteins during the assembly of the head of bacteriophage T4. Nature. 227:680-686.
- Lawson, L.D. and Hughes, B.G. 1988. Human absorption of fish oil fatty acids as triacylglycerols, free acid or ethyl esters. Biochem. Biophys. Res. Comm. 152:328-335.
- Lee, S.Y. and Rhee, J.S. 1993. Production and partial purification of a lipase from *Pseudomonas putida* 3SK. Enzyme Microb. Technol. 15:617-623.
- Lesuisse, E., Schanck, K. and Colson, C. 1993. Purification and preliminary characterization of the extracellular lipase of *Bacillus subtilis* 168 and extremely basic pH-tolerant enzyme. Eur. J. Biochem. 216:155-160.
- Liu, W.H., Beppu, T. and Arima, K. 1973. Purification and general properties of the lipase of thermophilic fungus *Humicola lanuginosa* S-38. Agr. Biol. Chem. 37 (1):157-163.
- Lowry, O.H., Rosebrough, N.J., Farr, A. L., Randall, R.J. 1951. Protein measurement with the folin-phenol reagent. J. Biol. Chem. 193:265-275.

- Macrae, A.R. 1983. Lipase-catalyzed interesterification of oils and fat. J. Am. Oil Chem. Soc. 61:1067-1071.
- Makhzoum, A. Owusu-Apenten, R.K. and Knapp, J.S. 1996. Purification and properties of lipase from *Pseudomonas fluorescens* Strain 2D. J. Dairy Sci. 6:459-472.
- Mayordomo, I., Randez-Gil, F. and Prieto, J.A. 2000. Isolation, purification, and characterization of a cold-active lipase from *Aspergillus nidulans*. J. Agric. Food Chem. 48:105-109.
- Meade, H.M., Long, S.R., Ruvkun, G.B., brown, S.E. and Ausubel, F.M. 1982. Physical and genetic characterization of symbiotic and auxotrophic mutants of *Rhizobium meliloti* induced by transposon Tn5 mutagenesis. J. Bacterial. 149:114-122.
- Minoguchi, M. and Muneyuki, T. 1989. Immobilization of Lipase on Polyacrylamide and Its Use in Detergents, Japanese Patent 1285188.
- Mitsuhashi, K., Yamashita, M., Hwan Y.S., Ihara, F., Nihira, T. and Yamada, Y. 1999. Purification and characterization of a novel extracellular lipase catalyzing hydrolysis of oleyl benzoate from *Acinetobacter* nov. sp. Strain KM109. Biosci. Biotechnol. Biochem. 63:1959-1964.
- Nawani, N., Dosanjh, N.S. and Kaur, J. 1998. A novel thermostable lipase from a thermophilic *Bacillus* sp. : characterization and esterification studies. Biotechnol. Lett. 20(10):997-1000.
- Nishioka, M., Joko, K. and Takama, M. 1990. Lipase manufacture with *Candida* for use in detergents. Japanese Patent 292281.
- O' Connell, M.P. 1984. Genetic transfer in prokaryotes:transformation, transduction and conjugation. In Advance molecular genetic (Puhler, A. and Timmis, K.N., eds.), p.2-12. Springer-Verlag, Berlin.

- Ogino, H., Nakagawa, S., Shinya, K., Muto, T., Fujimura, N., Yasuda, M. and Ishikawa, H. 2000. Purification and characterization of organic solvent-stable lipase from organic solvent-tolerant *Pseudomonas aeruginosa* LST-03. *J. Biosci. Bioeng.* 89 (5):451-457.
- Omar, I.C. and Jamil, N.I.N. 1991. Production of exogenous lipase by *Aspergillus niger* grown on a palm oil medium. *J. Bioscience.* 2(1,2):15-28.
- Onishi, K., Yoshida, Y. and Sekigushi, J. 1994. Lipase production of *Aspergillus oryzae*. *J. Ferment. Bioeng.* 77(5):490-495.
- Pernas, M.A., Lopez, C., Pastrana, L. and Rua, M.L. 2000. Purification and characization of Lip2 and Lip3 isoenzymes from a *Candida rugosa* pilot-plant scale fed-batch fermentation. *J. Biotechnol.* 84:163-174.
- Perrin, D.D. and Dempsey, B. 1974. Buffers for pH and Metal ion Control. London : Chapman and Hall.
- Plummer, D.T. 1987. An Introduction to Practical Biochemistry. 3<sup>rd</sup> ed. London:McGraw Hill Book Co., Ltd.
- Posorske, L.H. 1984. Industrial-Scale Application of Enzymes to the Fats and Oils Industry. *Ibid.* 61:1758-1760.
- Porter, R.D. 1988. Modes of gene transfer in bacteria. In Genetic recombination (Kucherlapati, R. and Smith, G.R., eds), p.1-30. American Sociaty for Microbiology. Washington D.C.
- Priefer, U., Simon, R. and Puhler, A. 1984. Cloning with cosmids. In Advanced Molecular Genetics (ed. A. Puhler and K.N. Timmis)Vol.1, pp190-201. Springer-Verlag, Berlin.
- Quyen, D.T., Schmidt-Dannert, C. and Schmid, R.D. 1999. High-level formation of active *Pseudomonas cepacia* lipase after heterologous expression of the encoding gene and its modified chaperone in *Escherichia coli* and rapid in vitro refolding. *Appl. Environ. Microbiol.* 65(2):787-794.

- Robert, V. 1997. Interfacial activation of lipases facts and artifacts. TIBTECH. 15:32-38.
- Rua, M.L., Atomi, H., Schmidt-Dannert, C. and Schmid, R.D. 1998. High-level expression of the thermoalkalophilic lipase from *Bacillus thermocatenulatus* in *Escherichia coli*. Appl. Microbiol. Biotechnol. 49:405-410.
- Schmidt-Dannert, C., Sztajer, H., Stocklein, W., Menge, U. and Schmid, R.D. 1994. Screening, purification and properties of a thermophilic lipase from *Bacillus thermocatenulatus*. Biochim. Biophys. Acta. 1214:43-53.
- Schmidt-Dannert, C., Rua, M.L., Atomi, H. and Schmid, R.D. 1996. Thermoalkalophilic lipase of *Bacillus thermocatenulatus*. I. Molecular cloning, nucleotide sequence, purification and some properties. Biochim. Biophys. Acta. 1301:105-114.
- Schuepp, C., Kermasha, S., Michalski, M.C. and Morin, A. 1997. Production, partial Purification and characterisation of lipases from *Pseudomonas fragi* CRDA 037. Process Biochem. 32:225-232.
- Scopes, R.K. 1987. Techniques for protein purification. In Techniques in the Life Sciences:Techniques and Enzymes. Biochemistry. Zeds. Kornberg, H.L., Metcalfe, J.C., Northcote, D.H., Pogson, C.I. and Tipton, K.F.) pp. 1-42, Amsterdam:Elesver/North-Holland Biochemcal Press.
- Seitz, E.W. 1974. Industrial applications of microbial lipase-a review. J. Am. Oil Chem. Soc. 51:12-16.
- Shahani, K.M. 1975. Lipase and esterase. In Enzymes in Food Processing (ed. G. Reed) pp.182-215 Academic Press : New York.
- Sidhu, P., Sharma, R., Soni, S.K. and Gupta, J.K. 1998. Production of extracellular alkaline lipase by a new thermophilic *Bacillus* sp. Folia Microbiol. 43:51-54.
- Sommer, P., Bormann, C. and Gotz, F. 1997. Genetic and biochemical characterization of a new extracellular lipase from *Streptomyces cinnamomeus*. Appl. Environ. Microbiol. 63(9):3553-3560.

- Sugihara, A., Tani, T. and Tominaga, Y. 1991. Purification and characterization of a novel thermostable lipase from *Bacillus* sp. J. Biochem. 109:211-216.
- Sugihara, A., Ueshima, M., Shimada, Y., Tsunasawa, S. and Tominaga, Y. 1992. Purification and characterization of a novel thermostable lipase from *Pseudomonas cepacia*. J. Biochem. 112:598-603.
- Sztajer, H., Borkowsdi, J. and Sobiech, K. 1991. Purification and some properties of *Pseudomonas fluorescens* lipase. Biotechnol. Appl. Biochem. 13:181-186.
- Tanaka, J., Hirano, J. and Funada, T. 1992. Concentration of DHA in glyceride by hydrolysis of fish oil with *Candida cylindracea* lipase. J. Am. Oil Chem. Soc. 69:1210-1214.
- VanDermark, P.J. and Batzing, B.L. 1987. The Microbes and Their Environments. In The Microbes : An Introduction to Their Nature and Importance. pp. 131-173. Benjamin Cummings : California.
- Villeneuve, P. and Foglia, T.A. 1997. Lipase specificities : potential application in lipid bioconversion. INFORM. 8:640-650.
- Wang, Y.J., Sheu, J.Y., Wang, F.F. and Shaw, J.F. 1988. Lipase-catalyzed oil hydrolysis in the absence of added emulsifier. Biotechnol. Bioeng. 31:628-633.
- Wang, Y., Srivastava, K.C., Shen, G.J. and Wang, H.Y. 1995. Thermostable alkaline lipase from a newly isolated thermophilic *Bacillus*, strain A30-1(ATCC 53841) J. Ferment. Bioeng. 79:433-438.
- Wong, D.W.S. 1995. Food enzyme : structure and mechanism. New York : Chapman& Hall. 170-200.
- Yamane, T. 1987. Enzyme technology for the lipid industry : An engineering overview. J. Am. Oil Chem. Soc. 64:1657-1661.
- Yasuda, M., Ogino, H., Kiguchi, T., Kotani, T., Takakura, S., Ishibashi, T., Nakashima, T., Fukuda, H. and Ishikawa, H. 1999. Purification and characterization of lipase from *Rhizopus chinensis* cells. J. Biosci. Bioeng. 88(5):571-573.