



- Aihara, H., Watanabe K., Nakamura, R., 1988. Degradation of Cholesterol in Egg Yolk by *Rhodococcus equi* No 23. J. of Food Sci. (53); 659-660.
- Arima, k., Nagasawa, M., Bae, M., Tamura, G., 1969. Decomposition of Cholesterol by Microorganism. J. Agr. Biol. Chem (33); 1636-1643.
- Bergey's, 1994. Manual of Determinative Bacteriology. The Williams & Wilkins Co., Baltimore, USA.
- Buckland, B.C., Lilly, M.D., Dunhill, P., 1976. The Kinetics of Cholesterol Oxidase Synthesis by *Nocardia rhodocrous*. Biotech. & Bioengine. (VIII); 601-621.
- Cheetam, S.J., Dunhill, P., Lilly, M.D., 1982. The Characterization and Interconversion of Three Forms of Cholesterol oxidase extracted from *Nocardia rhodocrous*. J. Biochem (201); 515-521.
- Cheillan, F., Lafont, H., Ferminé, E., Fernandes, F., Paul., S., Guy, L., 1983. Molecular Characteristics of the Cholesterol Oxidase and Factors Influencing its Activity. Biochemica et Biophysica Acta. (999); 233-238.
- Crueger, W.F., and Anne Liese Crueger, 1984. Biotechnology, A Text Book of Industrial Microbiology. Sci. Tech. Inc. Madison, USA.
- Dixon, M. & Webb, E.C. 1964. Enzymes. Academic Press, Inc., Pbl., New York.
- Fardiaz, S., 1988. Fisiologi Fermentasi. PAU IPB, Bogor.
- Flygare, S., & Larson, P.O., 1989. Steroid Transformation in Aqueous Two Phase System: Side Chain Degradation of Cholesterol by *Mycobacterium* sp . Enzyme. Microb. Technol. (11); 752-759.
- Giese, C.A., 1979. Cell Physiology. 5th ed., Wb. Saunders Co., Japan.
- Harmayani, E., Elemas, Utami, T., Indrati, R., 1996. Effect of Dissolve Oxygen Tension on Cholesterol Oxidase Production by *Pseudomonas putida*. J. Indonesian Food & Nutrition Progress, (3); 13-24.



- Inouye, Y., Taguchi, K., Fujii, A., Ishimaru K., Nakamura, S., & Nomi, R., 1982. Purification and Characterization of Extracellular 3 β Hydroxysteroid Oxidase Produced By *Streptovorticillium cholesterolicum*. Bull. Chem. Pharm. (3); 951-958.
- Johnson, T.L. & Somkuti, G.A., 1990. Properties of Cholesterol Dissimilation by *Rhodococcus equi*. J. of Food Protection (53); 332-335.
- Kreit, I., Levebvre, G., Elhichami, A., Germain, P., Saghi, M., 1992. A Colorimetric Assay for measuring Cell free & Cell Bound Cholesterol Oxidase. J. Lipid (27).
- Kushiro, H., Nakamoto, J., Fukui, I., Ogawa, Z., Yamaguchi, Y., Arima, K., Hayashi, C., 1983. Cholesterol Content of Food Stuff.
- Lee, C.Y., Liu, W.H., 1992. Production of androsta- 1,4- diene-3,17- dione from Cholestetrol using Immobilized Growing Cells of *Mycobacterium* sp. NRR1 B-3683 Adsorbed on Solid Carriers. Appl. Microbiol. Biotechnol. (36); 598-603.
- Lee, K.M., & Biemann, J.F., 1985. Cholesterol Oxidase in Microemulsion: Enzymatic Activity on Substrate of Low Water Solubility and Inactivation by Hydrogen Peroxide. Bioorganic Chem. (14); 262-273.
- Machang'u, R.S. & Prescott J.F., 1991. Purification & Properties of Cholesterol Oxidases & Choline Phosphohydrolase. Can. J. Res. (55); 332-340.
- Marschek, W.J., Kraychy, S., Muir, R.D., 1971. Microbial Degradation of Sterol. Appl. Microbiol., 72-77.
- Mc.Cane, L., & Kendel, J., 1986. Microbiology: Essentials & Applications. Mc. Graw Hill Book Co., Singapore.
- Nakamatsu, T., Seppu, t., Arima, K., 1979. Microbial Degradations of Steroids to Hexahydroindanone Derivates. J. Biol. Chem., 44; (7); 1469-1474.
- Owen, R.W., Mason, A.N., Bilton, R.F., 1983. The Degradation of Cholesterol by *Pseudomonas* sp NCIB 10590 under Aerobic Conditions. J. Lipid. Research (24); 1500-1512.
- Palmer, T., 1991. Understanding Enzyme. Ellis Horwood Ltd., Chichester, England.



UNIVERSITAS
GADJAH MADA

**OPTIMASI KOMPOSISI MEDIA DAN KONDISI LINGKUNGAN PADA FERMENTASI ENZIM
KOLESTEROL OKSIDASE OLEH**

Micrococcus sp

RUDHY NATAWIDJAJA, Dr. Ir. Eni Harmayani, M.Sc.; Dr. Ir. Tyas Utami; Ir. M. Nur Cahyanto, M.Sc.

Universitas Gadjah Mada, 1997 | Diunduh dari <http://etd.repository.ugm.ac.id/>

- Rachman, A., 1989. Pengantar Teknologi Fermentasi. IPB, Bogor.
- Rahayu, K., 1991. Teknologi Enzim. Pusat Antar Universitas Pangan dan Gizi, Yogyakarta.
- Rhee, H.I., Jeong, K.J., Park, B.K., Choi, Y.S., Lee, S.Y., 1991. One Step Purification of Cholesterol Oxidase from Culture Broth of *Pseudomonas sp* using a Novel Affinity Chromatography Method. *J. of General microbiology* (137); 1213-1214.
- Said, G.E., 1987. Bicindustri, PT. Mediyatama Sarana Perkasa, Jakarta.
- Smith, A.G., & Brooks, C.J.W., 1977. The Substrate Specificity and Stereochemistry, Reversibility and Inhibition of The 3-oxosteroid $^4-^5$ Isomerase Component of Cholesterol Oxidase. *J. Biochem.* (167): 121-129.
- Smith M., Sullivan M., Goodman M., 1991. Reactivity of Milk Cholesterol with Bacterial Cholesterol Oxidase. *J. Agr. Food Chem.*, 39; 2158-2162.
- Spencer, L. G., D.Sc & Meade G.P., B.S., Ch.E. 1955. Cane Sugar Handbook. 8th ed., John Willey & Sons, Inc., London.
- Stanburry, P.E., Whittaker, A., 1984. Principles of Fermentation Technology. Pergamon Press, New York.
- Sudarmadji, S., Haryono, B., Suhardi, 1989. Analisis Hasil Pertanian. Liberty, Yogyakarta.
- Tercyak, A.M., 1991. Determination of Cholesterol and Cholesterol Esters. *J. Nutr. Biochem.*, (2); 281-296.
- Thenawijaya, M., 1982. Dasar - dasar Biokimia. Erlangga Jakarta.
- Tomioka H., Kagawa, M., Nakamura, S., 1976. Some Enzymatic Properties of 3 β Hydroxysteroid Produced by *Streptomyces violascens*. *J. Biochem.*, (79); 903- 915.
- Uwajima, T., Yagi, H., Terada, O., 1973. Properties of Crystalline 3 β Hydroxysteroid oxidase of *Brevibacterium sterolicum*. *Agr. Biol. Chem.* (6); 1149-1156.
- Watanabe, K., Aihara, H., Tachi, H., Nakamura, R., 1987. Degradation of 4-cholesten-3-one and 1,4 androstadiene-3,17-dione by Cholesterol Degrading Bacteria. *J. of Appl. Bacteriology*, (62); 151-155.



UNIVERSITAS
GADJAH MADA

**OPTIMASI KOMPOSISI MEDIA DAN KONDISI LINGKUNGAN PADA FERMENTASI ENZIM
KOLESTEROL OKSIDASE OLEH**

Micrococcus sp

RUDHY NATAWIDJAJA, Dr. Ir. Eni Harmayani, M.Sc.; Dr. Ir. Tyas Utami; Ir. M. Nur Cahyanto, M.Sc.

Universitas Gadjah Mada, 1997 | Diunduh dari <http://etd.repository.ugm.ac.id/>

- Watanabe, K., Aihara, H., Nakamura R., 1989 (a).
Degradation of Cholesterol in Lard By Extracellular &
Cell Bound Enzyne from *Rhodococcus equi* No.23. Lebensm-
Wiss Technol., (11); 98-99.
- Watanabe, K., Aihara, H., Nakagawa, Y., Nakamura, R., Sasahi, T., 1989
(b) . Properties of The Purified Extracellular
Cholesterol Oxidase from *Rhodococcus Equi* No.23.
J.Agric.Food.Chem. (37); 1178-1182.
- White, 1978. The Principle & Practiceof Yeast Production,
Part I, American Brewer, 20; 21-26.
- Wibowo, D., dkk., 1990. Teknologi Fermentasi. PAU Pangan
dan Gizi UGM, Yogyakarta.
- Winarno, F.G., 1983. Enzim Pangan. PT. Gramedia, Jakarta.