Daftar Pustaka

Abdel-Mawgoud, A.M., Aboulwafa, M.M. and Hassouna, N.A.H., 2011.Optimization of surfactin production by *Bacillus subtilis* isolate BS5. *Applied Biochemmistry and Biotechnology*. 150, 305–325.

Al-Bahry S.N., Al-Wahaibi, Y.M., Elshafie, A.E., Al-Bemani, A.S., Joshi, S.J., Al-Makhmari, H.S., dan Al-Sulaimani, H.S. 2012.Biosurfactant production by *Bacillus subtilis*B20 using date molasses and its possible application in enhanced oil recovery.*International Biodeterioration& Biodegradation*.XXX : 1-6.

Banat, I.M., Makkar, R.S. and Cameotra, S. 2000. Potential Commercial Applications of Microbial Surfactans.*Applied Microbiology and Biotechnology*. 5 (5) : 495-508.

Barakat, Khoulud M., Sahar W.M. hassan, and Osama M. Darwesh. 2017. Biosurfactant production by haloalkaliphilic *Bacillus* strains isolated from Red Sea, Egypt. *The Egyptian Journal of Aquatic Research*. 43(3) : 205-211.

Batrakov, S.G., Rodionova, T.A., Esipov, S.E., Polyakov, N.B., Sheichenko, V.I., Shekhovtsova, N.V., Lukin, S.M., Panikov, N.S. and Nikolaev, Y.A. 2003. A novel lipopeptide, an inhibitor of bacterial adhesion, from the thermophilic and halotolerant subsurface *Bacillus licheniformis* strain 603. *Biochemistry and Biophysica Acta.*1634: 107–115.

Bento F. M., De Oliveira Camargo F. A., Okeke B. C., Frankenberger W. T. 2005. Diversity of biosurfactant producing microorganisms isolated from soils contaminated with diesel oil. *Microbiological Research*. 160(3) : 249–255.

Borodoli, N.K. and Konwar, BK. 2008. Microbial surfactant-enhanced mineral oil recovery under laboratory conditions. *Colloids Surface B : Biointerfaces*. 63 : 73-82.

Brackmann B. and C.D. Hager. 2004. *The statistical world of raw material, fatty alcohols and surfactants*. 6th World Surfactant Congress - CESIO 2004. Berlin.

Chen, W.C., Juang, R.S. and Wei, Y.H. 2015.Applications of lipopeptidebiosurfactant, surfactin, produced by microorganism.*Biochemical Engineering Journal*. 103:158-169.

Chung, S., Kong, K., Buyer, J.S., Lakshman, D.L., Lydon, J., Kim, S.D., and Roberts, D.P. 2007. Isolation and partial characterization of *Bacillus subtilis* ME488 for suppression of soilborne pathogens of cucumber and pepper. *Applied Microbiology and Biotechnology*.80(1):115-23.

Cooper, David G., and Goldenberg, Beena G. 1987. Surface-active agents from two *Bacillus* species. *American Society for Microbiology*. 53 : 2.

Cooper, D. G., MacDonald, C. R., Duff, S. J. B. and Kosaric, N. 1981.Enhanced production of surfactin from *B. subtilis* by continuous product removal and metal cation additions. *Applied Environmental Microbiology*. 42:408–412.

Dadrasnia, A. and Ismail, S. 2015. Biosurfactant Production by *Bacillus salmalaya* for Lubricating Oil Solubilization and Biodegradation. *International Journal of Environmental Research and Public Health*. 12 : 9848-9863.s

Daniel, H., Reuss, M., and Syldatk, C. 1998. Production of sophorolipids in high concentration from deproteinized whey and rapeseed oil in a two stage fed batch process using Candida bombicola ATCC 22214 and Cryptococcus curvatus ATCC 20509. *Biotechnology letters.* 20: 1153-1156.

Das, P., Mukherjee, S. and Sen, R. 2008. Genetic Regulation of Biosynthesis of Microbial Surfactants : an Overview. *Biotechnology and Genetic Engineering Review*. 25 : 165-186.

Desai J.D. and Desai A.J. 1993. Production of Biosurfactant.In :Biosurfactant : Production, Properties, Application. Kosaric (ed). Marcel Dekker Inc. New York.

Desai, J.D. and I.M. Banat. 1997. Microbial Production of Surfactants and Their Commercial Potential. *Microbiology and Molecular Reviews.*61(01) : 47-64.

Duitman, E.H., Hamoen, L.W., Rembold, M., Venema, G., Seitz, H., Saenger, W., Bernhard, F., Reinhardt, R., Schmidt, M., Ullrich, C., Stein, T., Leenders, F., and Vater, J. 1999. The mycosubtilinsynthetase of *Bacillus subtilis*ATCC6633: a multifunctional hybrid between a peptide synthetase, an

amino transferase, and a fatty acid synthase. *Proceedings of the National Academy of Sciences. USA.*96 : 13294–13299.

El-Sheshtawy, H.S., Aiad, I., Osman, M.E., Abo-Elnasr, A.A., and Kobisy, A.S. 2015. Production of biosurfactant from *Bacillus licheniformis* for microbial enhanced oil recovery and inhibition the growth of sulfate reducing bacteria. *Egyptian journal of Petroleum*. 24(2): 155-162.

Erkkila, S., Venalainen, M., Hielm, S., Petaja, E., Puolanne, E., and Mattila-Sandholm, T. 2000. Survival of *Escherichia coli* O157:H7 in dry sausage fermented by probiotic lactid bacteria. *Journal of the Science of Food and Agriculture*. 80 : 2101-2104.

Fairbanks, D.J., and Andersen, W.R. 1999. Genetics: the continuity of life. Wadsworth and Brooks/Cole Publishing Companies, Pacific Grove. California

Faria, A.F., Teodoro-Martinez, D.S., Barbosa, G.N., Vaz, B.G., Silva, I.S., Garcia, J.S., Totola, M.R., Eberlin, M.N., Grossman, M., Alves., O.L., danDurrant, L.R. 2011. Production and structural characterization of surfactin (C14/Leu7) produced by *Bacillus subtilis*LSFM-05 grown on raw glycerol from the biodiesel industry. *Process Biochemistry.*46 : 1951 – 1957.

Fatimah, Ni'matuzahroh, Alami, N.H., Supriyanto, A. and Affandi, M. 2009. Screening of Biosurfactant Production of Hidrocarbonoclastic Microbes Isolated from Oil Polluted Soil. Proceeding 10th Congress and International Conference of Indonesian Society for Microbiology, Surabaya.

Frautz, B., Lang, S., and Wagner, F. 1986. Formation of cellobiose lipids by growing and resting cells of *Ustilago maydis*. *Biotechnology Letters*. 8: 757-762.

Gerber, F., Krummen, M., Polgeter, H., Roth, A., Smith, C., and Spoendlin, C. 2004. Practical aspects of fast reversed-phase high performance liquid chromatography using 3um particle packed columns and monolithic columns in pharmaeutical development and production working under current good manufacturing practice. *Journal of Chromatography*. 1036(2): 127-133.

Georgiou, G. Lin, S.C. and Sharma M.M. 1990.Surface-active compounds from microorganisms.*Biotechnology*, 10: 60-65.

Genaro. 1990. Rhemington's Pharmaceutical Science. 18th Ed. Mack Printing Company. Easton. Pennsylvania. USA. p. 207

Geys, R., Soetaert, W. and Van Bogaert I. 2014. Biotechnological opportunities in biosurfactant production.*Current Oppinion in Biotechnology*. 30:66-72.

Gudina, E.J., Fernandes, E.C., Rodrigues, A.I., Teixeira, J.A. and Rodrigues, L.R..2015. Biosurfactant Production by *Bacillus subtilis*using Corn Steep Liquor as Culture Medium.*Frontier in Microbiology*. 6:59-65.

Hathout, Y., Ho, Y.P., Ryzhov, V., Demirev, P. and Fenselau, C. 2000. Kurstakins: a new class of lipopeptides isolated from *Bacillus thuringiensis*. *Journal of Natural Products.*63: 1492–1496.

He, H., Shen, B., Korshalla, J. and Carter, G.T. 2001.Circulocins, new antibacterial lipopeptides from *Bacillus circulans*, J2154.*Tetrahedron*.57: 1189–1195.

Hillis D.M., Moritz, C., and Mable, B.K. 1996. Molecular Systematics. Sunderland. MA: Sinauer Associates Inc. 205–247.

Hisatsuka, K., Nakahara, T., Sano, N. and Yamada. K. 1971. Formation of rhamnolipid by *Pseudomonas aeruginosa*: its function in hydrocarbon fermentations. *Agriculturaland Biological Chemistry*. 35:686–692.

Hommel, R.K., Stener, S., Huse, K., and Kleber, H.P. 1994. Cytochrome P450 in the sophorose-lipid producing yeast Candida (Torulopsis) apicola. *Applied Microbiology Biotechnology*. 40: 724-728.

Horowitz, S., Gilbert, J.N., and Griffin, W.M. 1990.Isolation and characterization of a surfactant produced by *Bacillus licheniformis*. *Journal of Industrial Microbiology.*6: 243–248.

Ines, M. and Dhouha, G. 2015.Lipopeptide surfactants: Production, recovery and pore forming capacity. *Peptides*. 71:100-112.

Isogai, I., Takayama, S., Murakoshi, S. and Suzuki, A. 1982. Structure of β-amino acids in antibiotics iturin A. *Tetrahedron Letter.* 23: 3065–3068.

Ishigami, Y., Gama, Y., Yamaguchi, M., Nakahara, H., Kamata, T. 1987. Surface active properties of rhamnolipids as microbial biosurfactants. *Japan Oil Chemists' Society*. 36:791–796.

Javaheri, M., Jenneman, G. E. McInnerney, M. J. and Knapp, R. M. 1985.Anaerobic production of a biosurfactant by *Bacillus licheniformis* JF-2. *Applied and Environmental Microbiology*. 50:698–700.

Joshi, S., Bharucha, C., Jha, S., Yadav, S., Nerurkar, A. and Desai, A.J. 2008. Biosurfactant production using molasses and whey under thermophilic conditions. *Bioresource Technology*. 99:195-199.

Kaczorek, E., Olszanowski, A., and Cybylski, Z. 2005. Analysis of Surface Tension During Biodegradation of Hydrocarbon. *Polish Journal of Environmental Studies*. 14: 179-183.

Kakinuma, A., Ouchida, A., Shima, T., Sugino, H., Isono, M., Tamura, G. and Arima, K. 1969. Conformation of the structure of surfactin by mass spectrometry. *Agricultural and Biological Chemistry*.33 :1669–1671.

Kim, P.I., Ryu J., Kim, Y.H. and Chi, Y.T. 2010. Production of biosurfactant lipopeptides Iturin A, fengycin and surfactin A from *Bacillus subtilis* CMB32 for control of C*olletotrichum gloeosporioides*. *Journal of Microbiology and Biotechnology*. 20:138–145.

Kitamoto, D., Isoda, H. and Nakahara, T. 2002. Review : Functions and Potential Applications of Glycolipid Biosurfactant –from Energy-Saving Materials to Gene Deleivery Carriers. *Journal of Bioscience and Bioengineering.*94 (3) : 187-201.

Koglin, A., and Walsh, C. T. 2009. Structural insights into nonribosomal peptide enzymatic assembly lines. *Natural Product Reports*. 26: 987–1000.

Kosaric, N. 1993. Biosurfactant, Production, Properties, and Application. Marcel Dekker INC. New York. Pp 31-73, 329-368.

Konz, D., Doekel, S., and Marahiel, M.A. 1999.Molecular and biochemical characterization of the protein template controlling biosynthesis of the lipopeptidelichenysin. *Journal of Bacteriology.*181: 133–140.

Lang, S. and Philip, J.C. 1998. Surface-active lipids in rhodococci. *Antonie van Leeuwenhoek.*74: 59-70.

Lang, S. and Wullbrandt, D. 1999. Rhamnose lipids – biosynthesis, microbial production and application potential. *Applied Microbiology and Biotechnology*. 51: 22-32.

Lee, S.C., Kim, S.H., Park, I.H., Chung, S.Y. and Choi, Y.L. 2007.Isolation and structural analysis of bamylocin A, novel lipopeptide from *Bacillus amyloliquefaciens* LP03 having antagonistic and crude oil-emulsifying activity. *Archives of Microbiology*.188 : 307–312.

Li, J. and Jensen, S.E. 2008. Nonribosomal biosynthesis of fusaricidins by *Paenibacillus polymyxa* PKB1 involves direct activation of a D-amino acid. *Chemistry and Biology*.15: 118–127.

Lin, S.C., Minton, M.A., Sharma, M.M., and Georgiou, G. 1994.Structural and immunological characterization of a biosurfactant produced by *Bacillus licheniformis* JF-2.*Applied and Environmental Microbiology*.60: 31–38.

Loffert, D., Stump, S., Schaffrath, N., Berkenkopf, M., and Kang, J. 1997. PCR: effects of template quality. *Qiagen News.* 1 : 8-10.

Luna, J.M.; Rufino, R.D.; Sarubbo, L.A.; Rodrigues, L.R.M.; Teixeira, J.A.C.; Campos-Takaki, G.M. 2011. Evaluation antimicrobial and antiadhesive properties of the biosurfactantlunasan produced by *Candida sphaerica* UCP 0995. *Current Microbiology*.62 :1527–1534.

Maier, R.M., and Soberon-Chaves, G. 2011.Biosurfactants : a general overview. In Soberon Chaves G (editor) :Biosurfactants from Genes to Applications (1-13). USA. Springer.

Makkar, R.S.; and Cameotra, S.S. 1997. Utilization of molasses for biosurfactant production by two Bacillus strains at thermophilic conditions. *Journal of the American Oil Chemists' Society*. 74 : 887-889.

Margaritis, A., Kennedy, K. and Zajic, J. E. 1980.Application of an air lift fermenter in the production of biosurfactants. *Journal of Industrial Microbiology and Biotechnology*. 21:285–294.

Mathiyazhagan, N., Danashekar, K., and Natarajan, D. 2011. Amplification of biosurfactant producing gene (rhlb) from *Pseudomonas aeruginosa* isolated from oil contaminated soil. *International Journal of pharma and bioscience.* 2 :497-504

Mercade, M.E.; and Manresa, M.A. 1994. The use of agroindustrial by-products for biosurfactant production. *Journal of the American Oil Chemists' Society*.71: 61-64.

Mishra, M., Muthuprasanna, P., Surya prabha, K., Sobhita rani, P., Satishbabu, I.A., Chandiran, I.S., Arunachalam, G. and Shalini, S. 2009. Basics and Potential Applications of Surfactants – A Review.*International Journal of PharmTech Research*. 01 (04) : 1354-1365.

Mubarak, M.Q.E., Hassan, A.R., Hamid A.A., Khalil S., and Isa M.H.M. 2015. A Simple and Effective Isocratic HPLC Method for Fast Identification and Quantification of Surfactin.*SainsMalaysiana.* 44(1): 115–120.

Muladno. 2002. Seputar Teknologi Rekayasa Genetika. Pustaka Wirausaha Muda. Bogor.

Mulligan, C.N. 2005. Environmental applications for biosurfactants. *Environmental Pollution.* 133:183-198.

Muthusamy, K., Gopalakrishnan, S., Ravi, T.K. and Sivachidambaram, P. 2008. Biosurfactants: Properties, commercial production and application. *Current Science*. 94: 736–747.

Naruse, N., Tenmyo, O., Kobaru, S., Kamei, H., Miyaki, T., Konishi, M. and Oki, T. 1990. Pumilacidin, a complex of new antiviral antibiotics : Production, isolation, chemical properties, structure and biological activity. *Journal of Antibiotic (Tokyo).43*, 267–280.

Neu, T. R., and K. Poralla.1990. Emulsifying agent from bacteria isolated during screening for cells with hydrophobic surfaces. *Applied Microbiology and Biotechnology*.32:521–525.

Newton, C.A. and Graha,, G.A. 1997. PCR. 2nd edition. Springer-Verlag. New York

Ni'matuzahroh, Urtiningsih, T. dan Isnaeniet. 2003. Kemampuan Bakteri Hidrokarbonoklastik dari Lingkungan Tercemar Minyak dalam Memproduksi Biosurfaktan :Upaya Bioremediasi Lingkungan. LaporanPenelitian RUT VIII.3. Lembaga Penelitian Universitas Airlangga Surabaya.

Ni'matuzahroh, Trikurniadewi, N., Pramadita, A.R.A., Pratiwi, I.A., Salamun, Fatimah, and Sumarsih, S. 2016. Biodegradation of Naphtalene and

Phenanthren by *Bacillus subtilis* 3KP. *Proceeding of International Biology Conference 2016.* Published by AIP Publlishing. 978-0-7354-1528-7.

Nitschke, M., Ferraz, C., and Pastore, G.M. 2004. Selection of microorganisms for biosurfactant production using agroindustrial wastes. *Brazilian Journal of Microbiology*. 35 : 81-85.

Ochsner, U.A., Fiechter, A. and Reiser, J. 1994. Isolation, Characterization, and Expression in *Escherichia coli* of the *Pseudomonas aeruginosa* rhlAB Genes Encoding a Rhamnosyl transferase Involved in Rhamnolipid Biosurfactant Synthesis. *The Journal of Biological Chemistry*. 269 (31):19787-19795.

Oliveira, D.W.F., Franca, I.W.L., Felix, A.K.N., Martins, J.J.L, Giro, M.E.A., Melo, V.M.M, dan Goncalves, L.R.B. 2013. Kinetic study of biosurfactant production by *Bacillus subtilis* LAMI005 grown in clarified cashew apple juice. *Colloids and Surfaces B :Biointerfaces.*101 : 34-43.

Pereira, J.F.B., Gudina, E.J., Costa, R., Vitorino, R., Teixeira, J.A., Coutinho, J.A.P., dan Rodrigues, L.R. 2013. Optimization and characterization of biosurfactant production by *Bacillus subtilis* isolates towards microbial enhanced oil recovery applications. *Fuel.*111 : 259-268.

Petrikov, K., Delegan, Y., Surin, A.K., Ponamoreva, O., Puntus, I.F., Filonov, A. and Boronin, A. 2013. Glycolipids of Pseudomonas and Rhodococcus oil-degrading bacteria used in bioremediation preparations: Formation and structure. *Process Biochemistry.* 48: 931-935.

Plaza, G.A., Chojniak, J., Mendrek, B., Trzebicka, B., Kvitek, L., Panacek, A., Prucek, R., Zboril, R., Paraszkiewicz, K. and Bernat, P. 2015. Synthesis of Silver Nanoparticles by *Bacillus subtilis* T-1 growing on agro-industrial wastes and producing biosurfactant. *IET Nanobiotechnology.*25:1-7.

Porob S., Nayak S., Fernandes A., Padmanabhan P., Patil, B.A., Meena, R.M. and Rmaiah N. 2013. PCR screening for the surfactin (sfp) gene in marine *Bacillu* sstrains and its molecular characterization from *Bacillus tequilensis* NIOS11.*Turkey Journal of Biology*. 37: 212-221.

Pruthi, V. and Cameotra, S.S. 1997. Production of a biosurfactant exhibiting excellent emulsification and surface active properties by *Serratia marcescens. World Journal of Microbiology and Biotechnology.* 13: 133-135.

Rahim, R., Ochsner, UA., Olvera, C., Graninger, M., Messner, P., Lam, JS., and Soberon-Chavez, G. 2001. Cloning and functional characterization of the *Pseudomonas aeruginosa rhlC* gene that encodes rhamnosltransferase 2, an enzyme responsible for di-rhamnoolipid biosynthesis. *Molecular Microbiology*. 40 : 708-718.

Rapp, P., Bock, H., Wray, V., and Wagner, F. 1979.Formation, isolation and characterization of trehalose dimycolates from *Rhodococcus erythropolis* grown on n-alkanes. *Journal of Genetic Microbiology*.115:491–503.

Razafindralambo, H., Paquot, M., Baniel, A., Popineau, Y., Hbid, C., Jacques, P. and Thonart, P. 1996. Foaming properties of surfactin, a lipopeptidebiosurfactant from *Bacillus subtilis*.*Journal of the American Oil Chemists' Society*. Soc. 73:149–151.

Rocha, M.V.P., Barreto, R.V.G., Melo, V.M.M. and Goncales,L.R.B. 2009.Evaluation of cashew apple juice for surfactin production by *Bacillus subtilis*LAMI008. *Applied Biochemistry and Biotechnology. 155:63-75.*

Roongsawang, N., Washio, K. Morikawa, M. 2011. Review : Diversity of Nonribosomal Peptide Synthetases Involved in the Biosynthesis of Lipopeptide Biosurfactant. *International Journal of Molecular Sciences.*12 : 141-172.

Sambrook, J., and Russell, D.W. 2001. Molecular cloning . A Laboratory Manual. 3rd Cold Spring Harbor Laboratory Press. New York.

Sammai, A., Rukadee, O., Sobhon,V., and Maneerat, S. 2012. Biosurfactant production by *Bacillus subtilis* TD4 and *Pseudomonas aeruginosa* SU7 grown on crude glycerol obtained from biodesesl production plant as sole carbon source. *Journal of Scientific and Industrial Research*. 71 : 396-406.

Sansinenea, E. and Ortiz, A. 2011.Secondary Metabolites of Soil *Bacillus* spp. *Biotechnology Letter*. 33:1523-1538.

Satpute, S., Banpurkar, A., Dhakephalkar, P., Banat, I.M., and Chopade, B.A. 2010. Methods for investigating biosurfactants and bioemulsifiers: A review. *Critical Reviews in Biotechnology.* 30:127-144.

Schramm, L.L., Stasiuk, E.N. and Marangoni, D.G. 2003.Surfactants and their applications. *Annual Report Program Chemistry Section C (Physical Chemistry).* 99:3-48.

Sekhon, K.K., Kanna, S. and Cameotra, S.S. 2011. Enhanced biosurfactant production trough cloning of three genes and role of esterase in biosurfactant release. *Microbial Cell Factories.*10:49-59.

Singh, A., Van Hanne J.D., and Ward, O.P. 2007. Surfactants in microbiology and biotechnology: Part 2. Application aspects. Biotechnology Advance. 25 : 99-121.

Sousa, M., Dantas, I.T., Feitosa, F.X., Alencar, A.E.V., Soares, S.A., Melo, V.M.M., Goncalves, L.R.B. danSant'ana, H.B. 2014. Performance of a biosurfactant produced by *Bacillus subtilis* LAMI005 on the formation of oil/Biosurfactant/Water emulsion : study of the phase behavior of emulsified systems. *Brazilian Journal of Chemical Engineering,*vol 31 no 03, pp. 613-623.

Thoha, A.A.F.K. 2010.Pengaruh Konsentrasi Molase dan Waktu Inkubasi Terhadap Produksi Biosurfaktan *Bacillus subtilis* 3KP. *Skripsi.* FakultasSains and Teknologi, UniversitasAirlangga.

Trikurniadewi, N., 2015. Biodegradasi naftalen dan fenantren oleh *Bacillus subtilis* 3KP. Universitas Airlangga.

Uchida, Y., Tsuchiya, R., Chino, M., Hirano, J., dan Tabuchi, T. 1989. Extracellular accumulation of mono- and disuccinoyl trehalose lipids by a strain of Rhodococcus erythropolis grown on n-alkanes. Agricultural and Biological Chemistry. 53: 757-763.

Yakimov, M.M., Timmis, K.N., Wray, V., dan Frederickson, H.L. 1995. Characterization of a New Lipopeptide Surfactant Produced by Thermotolerant and Halotolerant Subsurface *Bacillus licheniformis* BAS50.*Applied and EnvironmentalMicrobiology*. pp. 1706–1713

Vaz, D.A., Gudina, E.J., Alameda, E.J., Teixeira, J.A., dan Rodrigues, L.R. 2012. Performance of a biosurfactant produced by a *Bacillus subtilis* strain isolated from crude oil samples as compared to commercial chemical surfactants. *Colloids and Surfaces B :Biointerfaces*89 : 167 – 174

Volpon, L., Besson, F. and Lancelin, J.M. 2000. NMR structure of antibiotics plipastatins A and B from *Bacillus subtilis* inhibitors of phospholipase A(2). *FEBS Letter*. *485*: 76–80.

Volpon, L., Tsan, P., Majer, Z., Vass, E., Hollosi, M., Noguera, V., Lancelin, J.M. and Besson, F. 2007. NMR structure determination of a synthetic analogue of bacillomycin Lc reveals the strategic role of L-Asn1 in the natural iturinic antibiotics. *Spectrochimica Acta Part A.*67 : 1374–1381.

Zhou,Q. and Kosaric, N. 1995. Utilization of canola oil and lactose to produce biosurfactant with *Candida bombicola. Journal of the American oil Chemists' Society.* 72: 67-71.

Zhu, K., and Rock, C.O. 2008. *RhlA* Converts *beta- Hydroxyacyl-Acyl* Carrier Protein Intermedaites in Fatty Acid Synthesis to the beta-*Hydroxydecanoyl-beta-Hydroxydecanoate* Component of Rhamnolipids in *Pseudomonas aeruginosa. Journal of Bacteriology*. 190 : 3147-3154.