REFERENCES

Acharya, A., Moulik,S. P., Sanyal, S. K., Mishra, B. K., Puriz, P. M.. (2002). Physicochemical Investigations of Microemulsification of Coconut Oil and Water Using Polyoxyethylene 2-Cetyl Ether (Brij 52) and Isopropanol or Ethanol. Journal of Colloid and Interface Science, 245, 163–170

APHA, AWWA, WEF. (1992). Standard Methods for the Examination of Water and Wastewater. American Public Health Association, Washington, DC.

Asakura, T. and Kaplan, D.L. In: Arutzen, C.J. (Eds). (1994). Encyclopedia of Agricultural Science vol. 4. Academic Press, New York.

Bini, E., D.P. Knight, and Kaplan. (2004). Mapping domain structures in silks from insects and spiders related to protein assembly. Journal of Molecular Biology, 335, 27-40.

Cai, X., Tong, H., Shen, X., Chen, W., Yan, J., Hu, J. (2009). Preparation and haracterization of homogeneous chitosan-polylactic acid/hydroxyapatite nanocomposite for bone tissue engineering and its mechanical properties evaluation. Acta Biomaterialia, 1-37.

Canselier, J. P., Delmas, H., Wilhelm, A. M., & Abismaı ̈l, B. (2002). Ultrasound emulsification an overview. Dispersion Science and Technology, 23(1–3), 333–349.

Chung, H.J., Go, D.H., Bae J.W., Jung, I.K., Lee, J.W., Park, K. D. (2005) Synthesis and characterization of Pluronic grafted chitosan copolymer as a novel injectable biomaterial. Current Applied Physics, 5, 485–488.

Cunniff P, Fossey S, Auerbach M, Song J, Kaplan D,Adams WW, et al. (1994). Mechanical and thermal properties of dragline silk from the spider N. clavipes. Advanced Polymer Technology, 5(8), 401–10.

Dawson, PL., Carl, GD., Acton JC., and Han IY. (2002). Effect of lauric acid and nisin-impregnated soy-based films on the growth of Listeria monocytogenes on turkey bologna. Poultry Science, 81 (5), 721–726.

Draye JP, Delaey B, Van Den Voorde A, Van Den Bulcke A,De Reu B, Schacht E. (1998) In vitro and in vivo biocompatibility of dextran dialdehyde cross-linked gelatin hydrogel films. Biomaterials, 19, 1677–87.

Elfwing, A., LeMarc, Y., Baranyi, J., Ballagi, A., 2004. Observing the growth and division of large number of individual bacteria using image analysis. Applied and Environmental Microbiology , 70, 675–678.

Eisenberg D. (2003) Proceedings of the National Academy of Sciences of the United States of America.100(20), 11207–10.

Fang, Q., Chen, D., Yang, Z., Li, M. (2009). In vitro and in vivo research on using Antheraea pernyi silk fibroin as tissue engineering tendon scaffolds. Journal of Materials Science and Engineering.

Feng, Q. L., Wu, J., Chen, G. Q., Cui, F. Z., Kim, T. N., & Kim, J. O.(2000). A mechanistic study of the antibacterial effect of silver ions on Escherichia coli and Staphylococcus aureus. Journal of Biomedical Material Research,52(4), 662–668.

Faulkner, D., Sutton, S., Hesford, J., Faulkner, B., Major, D., Hellewell, T., Laughon, M., Rodeheaver, G.,Edlich, R. (1997). A New Stable Pluronic F68 Gel Carrier for Antibiotics in Contaminated Wound Treatment. The American Journal of Emergency Medicine, Vol 15, Issue 1, Pages 20-24.

Gotoh, Y., Tsukada, M., Minoura, N. and Imai, Y. (1997). Synthesis of poly(ethylene glycol)-silk fibroin conjugates and surface interaction between L-929 cells and the conjugates. Biomaterials, 18, 267–271.

Hardy, J., Roemer, L, Scheibel, T. (2008). Polymeric materials based on silk proteins. Polymer 49, 4309-4327.

Hofmann, S., Wong, CT., Foo, P., Rossett, F., Textor,M., Vunjak-Novakovic, G., et al. (2006). Silk fibroin as an organic polymer for controlled drug delivery. Journal of Control Release, 111, 219–227.

Horvath, G., Wessjohann, L., Bigirimana, J., Jansen, M., Caubergs, R., Horemans, N. (2006) Differential distribution of tocopherols and tocotrienols in photosynthetic and non-photosynthetic tissues. Phytochemistry, 67, 1185–1195.

Huemmerich D, Slotta U, Scheibel T. (2006) Processing and modification of films made from recombinant spider silk proteins. Journal of applied physics A, 82, 219–22.

Jayadas, N.H., Prabhakaran Nairb, K. (2006) Coconut oil as base oil for industrial lubricants—evaluation and modification of thermal, oxidative and low temperature properties. Tribology International, 39, 873–878.

Jeong, L., Lee, KY., Liu, JW., Park, WH. (2006). Time-resolved structural investigation of regenerated silk fibroin nanofibers treated with solvent vapor. International Journal of Biological Macromolecules, 38, 140–144.

Jeong, L., Yeob, IS., Kim, HN., Yoon, Y., Jang, DH.,Jung, SY., Min, BM., Park, WH. (2009) Plasma-treated silk fibroin nanofibers for skin regeneration. International Journal of Biological Macromolecules, 44, 222–228

Jin, HJ., Park, J., Valluzzi, R., Cebe, P., Kaplan, DL. (2004) Biomaterial films of B. mori silk fibroin with poly(ethylene oxide). Biomacromolecules, 5(3), 711–7.

Jin, H. J., J. Park, V. Karageorgiou, U. J. Kim, R. Valluzzi, P. Cebe, D. L. Kaplan. (2005). Water-Stable Silk Films with Reduced β-Sheet Content. Advanced Functional Materials, 15, 1241-1247

Jones, V., Harding, K.: Moist wound healing, in Krasner DL, Rodeheaver GT, Sibbald RG (Eds.). (2001). ChronicWound Care: A Clinical Source Book for Healthcare Professionals. Wayne, PA, HMP Communications, 3, 245-252.

Kapila, N.S., Chami, D.H., Sagarika E. (2009). Comparison of the phenolic-dependent antioxidant properties of coconut oil extracted under cold and hot conditions. Food Chemistry, 114, 1444–1449.

Kaplan DL, Mello SM, Arcidiacono S, Fossey S, SenecalK WM. In:McGrath KKD, editor. (1998) Protein based materials. Birkhauser Boston, 103–31.

Kibbe, A. H. (2000). Handbook of pharmaceutical excipients. Pharmaceutical Association, Washington, American, 386–8.

Kim, H., Matsumoto, A., Chin, I., Jin, H., Kaplan, D. (2005) Processing windows for forming silk fibroin biomaterials into a 3D porous matrix. Australian Journal of Chemistry, 58, 716–20.

Kim, UJ.,Park, J., Kim, HJ.,Wada, M., Kaplan, DL. (2005). Three-dimensional aqueous-derived biomaterial scaffolds from silk fibroin. Biomaterials, 26, 2775–2785

Lawrence, B.D., Marchant, J.K., Pindrus, M.A., Omenetto, F.G., Kaplan, D.L. (2009). Silk film biomaterials for cornea tissue engineering. Biomaterial, 30, 1299–1308.

Li, C., Vepari, C., Jin, HJ., Kim, HJ., Kaplan, DL. (2006) Electrospun silk-BMP-2 scaffolds for bone tissue engineering. Biomaterials, 27(16), 3115–24

Li, Y., Leung, P., Yao, L., Song, Q. W., & Newton, E. (2006). Antimicrobial effect of surgical masks coated with nanoparticles. Journal of Hospital Infection, 62, 58–63.

Marina, A. M., Che Man, Y. B., Nazimah, S. A. H., & Amin, I. (2008). Antioxidant capacity and phenolic acids of virgin coconut oil.International. Journal of Food Sciences and Nutriton.

Mandal, B.B., Mann, J.K., Kundu, S.C. (2009). Silk fibroin/gelatin multilayered films as a model system for controlled drug release. European Journal of pharmaceutical Sciences, 1-12.

Mary G. Enig. In Support of Good Health in the 21st.

Meinel, L., Hofmannc, S., Karageorgiou, V., Kirker-Heade, C., McCool, J., Gronowicz, G., Zichner, L., Langer, R., Vunjak-Novakovic, G., Kaplanc, DL. (2005). The inflammatory responses to silk films in vitro and in vivo. Biomaterials, 26, 147–155.

Magoshi, J., Magoshi,Y., Nakamura, S. (1981). Journal of Polymer Science, Part B Polym. Physic, 19, 185.

Magoshi, J., Magoshi,Y., Nakamura, S. (1985). The glass transition and conformational change of Tussah silk fibroin. Journal of Applied Polymer Science, Applied polymer symposium, 41,187.

Min, BM., Lee, G., Kimb, SH., Namb, YS., Lee, TS., Parkb, WH. (2004) Electrospinning of silk fibroin nanofibers and its effect on the adhesion and spreading of normal human keratinocytes and fibroblasts in vitro. Biomaterials, 25, 1289–1297.

Motta, A., Fambri, L., Migliaresi, C. (2002) Regenerated silk fibroin films: thermal and dynamic mechanical analysis. Macromolecular Chemistry and Physics, 203(10–11), 1658–65.

Moy, RL., Lee, A., Zalka, A. (1991). Commonly used suture materials in skin surgery. Journal of American Family Physician , 44(6), 2123–8.

Muangsombat S.and medicine group (2006) The first wound care meeting of Thai society of wound healing. Bankok: Rachawitee Hospital, 1, 1-18.

Nakayama, S., Taketani, I.,Nagare, S.,Senna, M. (2004). Symposium on Continuous nanophase and nanostructured materials held at the 2003 MRS Fall Meeting , Dec 01–05, 2003. Continuous nanophase and nanostructured materials, 565.

Nazarov, R., Jin, HJ., Kaplan, DL. (2004) Porous 3-D scaffolds from regenerated silk fibroin. Biomacromolecules, 5(3), 718–26.

Nevin, K. G., Rajamohan, T. (2005). Virgin coconut oil supplemented diet increases the antioxidant status in rats. Food Chemistry, 99, 260–266.

Perez-Rigueiro, J., Viney, C., Llorca, J., Elices, M. (2000). Mechanical properties of single-brin silkworm silk. Journal of applied polymer science, 75, 1270–1277.

Pin, C., Baranyi, J., 2006. Kinetics of single cells: observation and modelling of a stochastic process. Applied and Environmental Microbiology , 72, 2163-2169.

Qiang Lu, Qingling Feng, Kun Hu, Fuzhai Cui. (2008) Preparation of three-dimensional fibroin/collagen scaffolds in various pH conditions. Journal of Materials Science: Materials in Medicine, 19, 629–634.

Rammensee, S., Huemmerich, D., Hermanson, KD., Scheibel, T., Bausch, AR. (2006) Rheological characterization of hydrogels formed by recombinantly produced spider silk. applied physic A, 82261–4.

Ritger, P.L., Peppas, N.A. (1987) A simple equation for description of solute release I. Fickian and non-fickian release from non-swellable devices in the form of slabs, spheres, cylinders or discs. Journal of Controlled Release, 5 (1), 23–36.

Sado Kamdem, S., Guerzoni, M.E., Baranyi, J., Pin , C. (2008). ffect of capric,lauric and α-linolenic acids on the division time distributions of single cells of Staphylococcus aureus. International Journal of Food Microbiology, 128, 122–128.

Sang Muk, L., Donghwan, C., Won Ho, P., Seung Goo, L., Seong Ok, H., Lawrence, T. D. (2005). Novel silk/poly(butylene succinate) biocomposites: the effect of short fibre content on their mechanical and thermal properties. Composites Science and Technology, 62, 647–657.

Santin, M., Motta, A., Freddi, G., Cannas, M. (1999). In vitro evaluation of the inflammatory potential of the silk fibroin. Journal of biomedical materials, 46, 382–389.

Schneider, A., Wang, X.Y., Kaplan, D.L., Garlick, J.A., Egles, C. (2009). Biofunctionaliized electrospun silk mats as topical bioactive dressing for accelerated wound healing. Acta Biomaterialia.

Shibata H, Shioya N, Kuroyangi Y. (1997) Development of new wound dressing composed of spongy collagen sheet containing dibutyryl cyclic AMP. Journal of Biomaterials Science, Polymer Edition, 8, 601–21.

Stevenson C.L.(2000). Characterization of Protein and Peptide Stability and Solubility in Non-Aqueous Solvents. Current Pharmaceutical Biotechnology, Volume 1,18, 165-182.

Tanaka K, Inoue S, Mizuno S. (1999) Hydrophobic interaction of P25, containing Asn-linked oligosaccharide chains, with the H–L complex of silk fibroin produced by B. mori. Insect Journal of Biochemistry and Molecular Biology, 29(3), 269–76.

Taketani, I., Nakayamaa, S., Nagareb, S., Sennaa, M. (2005). The secondary structure control of silk fibroin thin films by post treatment. Applied Surface Science, 244, 623–626.

Tsuboi, Y., Ikejiri, T., Shiga, S., Yamada, K., Itaya, A. (2001) Light can transform the secondary structure of silk protein. Applied Physics A: Materials Science & Processing, 73, 637–640.

Tomoko, N., & Fumiyoshi, I. (2004). Properties of various phosphatidylcholines as emulsifiers or dispersing agents in microparticle preparations for drug carriers. Colloids and Surfaces B: Biointerfaces, 39, 57–63.

Turner, TD. (1979). Hospital usage of absorbent dressings. Pharmaceutical J, 222, 421-424.

Ulubayram, K., Nur Cakar, A., Korkusuz, P., Ertan, C., Hasirci, N. (2001). EGF containing gelatin-based wound dressings. Journal of Biomaterials, 22, 1345–56.

Vepari, C., Kaplana, DL. (2007). Silk as a biomaterial., Progress Polymer in Science, 32 ,991–1007.

Vollrath ,F., Knight, DP. (2001). Liquid crystalline spinning of spider silk. Nature, 410(6828), 541–8.

Wongpanit, P., Sanchavanakit, N., Pavasant ,P., Bunaprasert ,T., Tabata ,Y. , Rujiravani, R. (2007). Preparation and characterization of chitin whisker-reinforced silk fibroin nanocomposite sponges. European Polymer Journal, 43, 4123–4135.

Wang, X., Hu, X., Daley, A., Rabotyagova, O., Cebe, P., Kaplan, D.L. (2007). Nanolayerbiomaterial coatings of silk fibroin for controlled release. Journal of Control Release, 121, 190–199.

Yamada, K., Tsuboi, Y., Itaya, A. (2003). Morphologies Reflecting the Secondary Structures. Thin Solid Films, 440, 208.

Yao, J., Asakura, T., in: Wnek, G.E., Bowlin, G.L. (Eds.). (2004) Encyclopedia of Biomaterials and Biomedical Engineering, Marcel Dekker Inc., New York, 1363.

Yasushi Tamada. (2005). New Process to Form a Silk Fibroin Porous 3-D Structure. Biomacromolecules, 6 (6), 3100-3106

Yoo, CR., Yeo ,IS., Park, KE., Park, JH., Lee, SJ., Park, WH., Min, BM. (2008). Effect of chitin/silk fibroin nanofibrous bicomponent structures on interaction with human epidermal keratinocytes. International Journal of Biological Macromolecules, 42, 324–334.

Zhang, H., Magoshi, J., Becker, M., Chen, JY., Matsunaga, R. (2002) Thermal properties of Bombyx mori silk fibres. Journal of Applied Polymer Science, 86, 1817–1820.

Zhang, Y., Venugopal, J.R., El-Turki , A., Ramakrishna,S., Su,B., Limb, C.T. (2008). Electrospun biomimetic nanocomposite nanofibers of hydroxyl-apatite/chitosan for bone tissue engineering. Biomaterials , 29 , 4314–4322.

Zhou, C.Z., Confalonieri, F., Medina, N., Zivanovic, Y., Esnault, C., Yang, T., Jacquet, M., Janin, J., Duguet, M., Perasso, R. and Li, Z.G. (2000). Fine organization of Bombyx mori fibroin heavy chain gene. Nucleic Acids Research. 28, 2413-2419.

APPENDICES

APPENDIX A Effect of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet on the degree of swelling and Equilibrium fluid content.

Table A1 Effect of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet on the degree of swelling of (A) Un-coating (B) Single coating (C) Double coating (D) Triple coating in buffer solution pH 5.5 at 37°C

(A)

Time(h)	Degree of swelling(%)			Average	Standard deviation
0	0	0	0	0	0
2	14.54	14.72	15.36	14.87	0.43
4	32.86	37.06	34.72	34.88	2.10
6	58.45	53.69	51.85	54.66	3.41
8	27.64	28.27	33.05	29.65	2.96
10	-13.48	-7.38	-5.89	-8.92	4.02

(B)

Time(h)	Degree of swelling(%)			Average	Standard deviation
0	0	0	0	0	0
2	19.97	26.23	23.44	23.22	3.14
4	33.03	27.47	28.35	29.61	2.99
6	34.41	32.13	32.23	32.92	1.29
8	34.13	42.48	36.33	37.65	4.33
10	37.10	44.20	39.46	40.25	3.61
12	38.83	45.33	40.67	41.61	3.35
14	41.23	46.58	44.56	44.12	2.71
17	38.80	45.99	43.79	42.86	3.68
18	35.38	44.06	39.50	39.65	4.35
20	34.24	42.31	39.35	38.63	4.09
22	31.52	37.03	30.46	33.00	3.53
24	30.06	34.82	32.49	32.46	2.38

(C)

Time(h)	Degree of swelling(%)			Average	Standard deviation
0	0	0	0	0	0
2	21.16	20.55	20.53	20.75	0.36
4	26.11	26.13	25.67	25.97	2.75
6	24.93	28.60	24.67	26.06	1.99
8	32.42	33.87	28.64	31.65	4.49
10	31.91	36.84	32.06	33.61	2.66
12	35.02	40.34	34.66	36.67	4.30
14	36.56	39.62	34.30	36.82	2.88
17	40.72	44.08	38.44	41.08	3.91
18	42.06	44.64	40.00	42.24	2.50
20	43.85	45.92	40.66	43.48	2.72
22	45.23	48.14	43.59	45.65	2.56
24	47.17	48.89	44.99	47.02	2.19

(D)

Time(h)	Degree of swelling(%)			Average	Standard deviation
0	0	0	0	0	0
2	16.09	16.95	17.11	16.72	0.55
4	20.19	20.66	20.65	20.50	0.27
6	21.20	22.99	22.94	22.38	1.02
8	24.84	26.07	26.50	25.80	0.87
10	27.53	26.09	27.11	26.91	0.74
12	27.05	31.18	30.91	29.72	2.31
14	28.40	31.36	30.86	30.20	1.58
17	30.36	33.45	33.10	32.30	1.69
18	30.85	34.35	34.06	33.09	1.94
20	32.50	35.41	35.26	34.39	1.64
22	33.47	36.12	36.33	35.31	1.60
24	34.75	38.59	38.06	37.13	2.08

Table A2 Effect of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet on the equilibrium water content of (A) Un-coating (B) Single coating (C) Double coating (D) Triple coating in buffer solution pH 5.5 at 37°C

(A)

Time(h)	Equilibrium water content(%)			Average	Standard deviation
0	0.00	0.00	0.00	0.00	0.00
2	12.69	12.83	13.31	12.95	0.32
4	24.73	27.04	25.77	25.85	1.15
6	36.89	34.93	34.15	35.32	1.41
8	21.66	22.04	24.84	22.85	1.74
10	-15.58	-7.96	-6.26	-9.93	4.97

(B)

Time(h)	Equilibrium water content(%)			Average	Standard deviation
0	0	0	0	0	0
2	16.65	20.78	21.23	19.55	2.53
4	24.83	21.55	21.68	22.68	1.86
6	25.60	24.32	24.14	24.68	0.80
8	25.45	29.82	29.31	28.19	2.39
10	27.06	30.65	30.82	29.51	2.12
12	27.97	31.19	31.26	30.14	1.88
14	29.19	31.78	31.81	30.93	1.50
17	27.95	31.50	31.91	30.45	2.18
18	26.13	30.59	31.24	29.32	2.78
20	25.50	29.73	30.35	28.53	2.64
22	23.96	27.02	27.27	26.08	1.84
24	23.11	25.83	26.18	25.04	1.68

(C)

Time(h)	Equilibrium water content(%)			Average	Standard deviation
0	0	0	0	0	0
2	17.46	17.05	17.03	17.18	0.24
4	20.71	20.71	20.42	20.61	0.17
6	19.95	22.24	19.79	20.66	1.37
8	24.49	25.30	22.26	24.02	1.57
10	24.19	26.92	24.28	25.13	1.55
12	25.94	28.74	25.74	26.81	1.68
14	26.77	28.37	25.54	26.89	1.42
17	28.94	30.59	27.77	29.10	1.42
18	29.61	30.86	28.57	29.68	1.15
20	30.48	31.47	28.91	30.29	1.29
22	31.14	32.50	30.36	31.33	1.08
24	32.05	32.84	31.03	31.97	0.91

(D)

Time(h)	Equilibrium water content(%)			Average	Standard deviation
0	0	0	0	0	0
2	14.50	13.86	14.61	14.32	0.40
4	17.12	16.80	17.11	17.01	0.19
6	18.69	17.49	18.66	18.28	0.69
8	20.68	19.89	20.95	20.51	0.55
10	20.69	21.58	21.33	21.20	0.46
12	23.77	21.29	23.61	22.89	1.39
14	23.87	22.12	23.58	23.19	0.94
17	25.06	23.29	24.87	24.41	0.97
18	25.57	23.57	25.41	24.85	1.11
20	26.15	24.53	26.07	25.58	0.91
22	26.54	25.08	26.65	26.09	0.88
24	27.85	25.79	27.57	27.07	1.12

APPENDIX B Effect of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet on the evaporative water loss.

Table B1 Effect of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet on the evaporative water loss of (A) Single coating (B) Double coating (C) Triple coating in buffer solution pH 5.5 at 37°C

(A)

Time(h)	Evaporative water loss(%)			Average	Standard
0	100	100	100	100	0
2	81.81	81.31	81.17	81.43	0.34
4	69.03	65.14	68.94	67.70	2.22
6	60.50	56.37	60.47	59.11	2.37
8	53.26	49.67	53.55	52.16	2.16
10	49.29	46.48	48.42	48.06	1.43
12	46.86	44.58	47.36	46.27	1.48
14	45.04	44.39	45.63	45.02	0.62
16	43.85	43.29	44.83	43.99	0.78
18	43.19	43.04	44.22	43.49	0.64
20	42.61	42.81	43.36	42.93	0.39
22	42.48	42.75	42.96	42.73	0.24
24	42.36	42.65	42.42	42.48	0.15
27	42.25	42.58	42.29	42.37	0.18

(B)

Time(h)	Evaporative water loss(%)			Average	Standard deviation
0	100	100	100	100	0
2	89.91	91.06	91.33	90.77	0.75
4	80.73	83.89	84.19	82.94	1.92
6	75.43	79.35	74.49	76.42	2.58
8	70.55	75.18	75.51	73.75	2.77
10	67.09	72.28	72.37	70.58	3.02
12	64.52	69.93	70.28	68.24	3.23
14	62.45	67.68	68.05	66.06	3.13
16	60.80	65.84	66.26	64.30	3.04
18	59.60	64.58	64.13	62.77	2.76
20	57.52	62.43	61.73	60.56	2.66
22	56.45	61.27	60.85	59.53	2.67
24	55.32	59.91	59.71	58.31	2.59
27	54.39	58.59	58.34	57.11	2.36
30	54.35	58.53	58.28	57.06	2.35

(C)

Time	Evaporative water loss(%)			Average	Standard deviation
0	100	100	100	100	0
2	91.40	92.18	92.34	91.97	0.51
4	86.68	85.97	86.04	86.23	0.39
6	83.44	82.69	82.99	83.04	0.38
8	80.39	79.53	79.70	79.87	0.45
10	78.18	77.27	77.21	77.55	0.54
12	76.33	75.45	75.65	75.81	0.46
14	74.56	73.74	73.75	74.02	0.47
16	73.06	72.32	72.32	72.57	0.42
18	72.04	71.36	71.36	71.58	0.39
20	70.22	69.68	69.93	69.94	0.27
22	69.25	68.78	68.80	68.94	0.26
24	68.15	67.71	67.89	67.92	0.22
27	66.98	66.58	66.61	66.73	0.22
30	64.89	64.59	64.75	64.74	0.15
36	64.85	63.79	64.72	64.45	0.58

APPENDIX C Effect of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet on the Releasing Behavior.

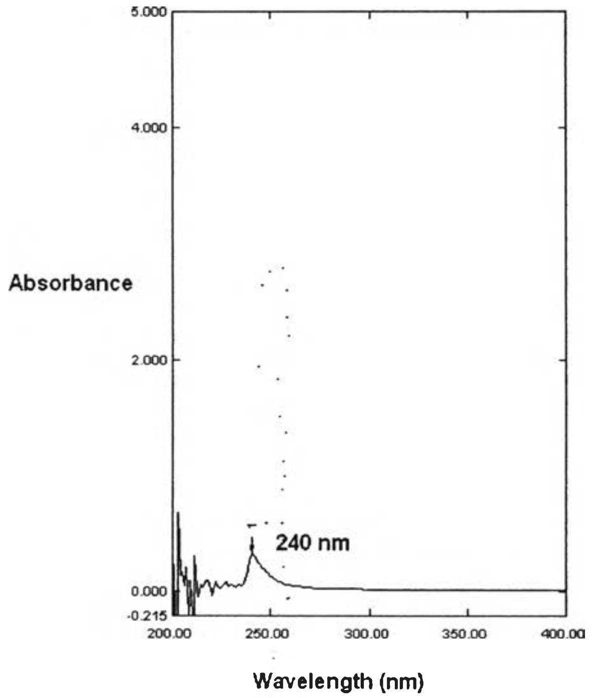

Figure 1 UV-Spectra of Coconut oil.

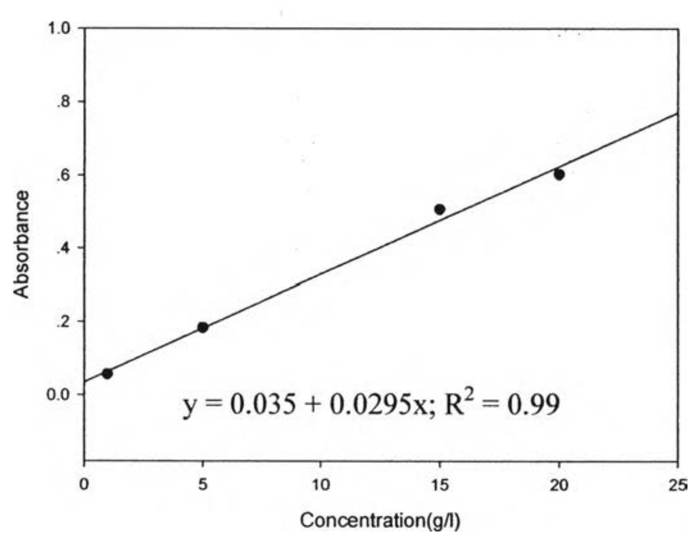

Figure 2 Calibration curve of solution Coconut oil in chloroform.

Table C1 Effect of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet on the released oil of (A) Single coating (B) Double coating (C) Triple coating in buffer solution pH 5.5 at 37°C

(A)

Time(h)	Released oil (%)			Average	Standard deviation
0	0	0	0	0	0
2	23.49	24.14	22.95	23.53	0.60
4	42.09	43.81	43.23	43.04	0.88
6	61.43	62.33	60.79	61.52	0.78
8	80.70	78.99	77.77	79.15	1.47
10	89.06	86.88	88.69	88.21	1.16
12	93.73	92.08	93.73	93.18	0.95
14	96.23	95.62	96.24	96.03	0.36
16	97.36	97.51	97.97	97.61	0.32
18	97.99	98.25	98.52	98.25	0.26
20	98.34	98.74	98.87	98.65	0.27
22	98.38	98.84	98.92	98.71	0.29
24	98.40	98.89	98.95	98.75	0.30

(B)

Time(h)	Released oil (%)			Average	Standard deviation
0	0	0	0	0	0
2	11.76	13.52	11.58	12.29	1.07
3	22.24	26.07	22.92	23.74	2.04
4	33.36	38.27	33.92	35.18	2.69
5	45.04	50.27	44.68	46.66	3.13
6	56.16	60.62	54.59	57.13	3.13
7	67.26	69.70	63.75	66.90	2.99
8	75.83	77.62	72.83	75.42	2.42
9	82.68	84.34	81.53	82.85	1.41
11	87.76	88.69	87.27	87.91	0.72
13	91.50	91.39	90.44	91.11	0.59
15	93.95	93.21	92.72	93.29	0.62
17	94.85	94.25	94.45	94.52	0.31
20	95.31	95.15	95.49	95.31	0.17
22	95.96	95.75	96.36	96.02	0.31
24	96.40	96.09	96.83	96.44	0.37
26	96.43	96.33	96.91	96.56	0.31
28	96.44	96.35	96.95	96.58	0.32

(C)

Time(h)	Released oil (%)			Average	Standard deviation
0	0	0	0	0	0
2	23.05	23.78	20.18	22.34	1.90
4	39.93	37.50	36.87	38.10	1.62
6	51.99	53.52	53.63	53.05	0.92
8	57.62	61.66	57.84	59.04	2.27
10	62.10	66.46	64.01	64.19	2.18
12	67.04	71.35	69.75	69.38	2.18
14	70.55	75.02	75.10	73.56	2.60
16	73.70	79.80	78.64	77.38	3.24
18	74.81	83.05	84.48	80.78	5.22
20	77.23	88.83	88.38	84.81	6.57
22	83.20	92.83	90.80	88.94	5.08
24	92.15	93.43	92.80	92.79	0.64
26	94.51	93.55	93.61	93.89	0.54
28	94.96	94.25	94.15	94.45	0.45
30	95.41	94.32	94.42	94.72	0.60

(D)

Time(h)	Released oil (%)			Average	Standard deviation
0	0	0	0	0	0
2	6.27	5.86	6.28	6.14	0.24
4	13.45	15.01	14.81	14.42	0.85
6	19.73	21.26	21.48	20.82	0.95
8	27.62	29.08	29.70	28.80	1.07
10	34.21	35.61	36.24	35.35	1.04
12	40.65	42.61	43.06	42.11	1.28
14	46.93	48.76	49.90	48.53	1.50
16	55.63	56.40	56.31	56.11	0.42
18	62.82	63.27	62.89	63.00	0.24
20	69.71	69.88	69.56	69.72	0.16
22	75.33	75.76	75.72	75.60	0.24
24	79.93	80.54	80.27	80.25	0.30
27	83.29	84.13	84.22	83.88	0.51
30	85.90	86.19	86.64	86.24	0.37
33	87.20	87.10	87.55	87.29	0.24
36	87.77	87.52	87.97	87.76	0.22
39	87.90	87.86	88.30	88.02	0.25
42	87.93	87.86	88.30	88.03	0.24

Table C2 The release mechanism of coating methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet that was fitted with of (A) Single coating (B) Double coating (C) Triple coating in buffer solution pH 5.5 at 37°C

The release constant (K) that is related to the structural and geometric properties of the dosage form and the release exponent (n) that is indicate the type of oil release mechanism were determined based on Fickian equation.

$$\text{Log}\ (Mt/M\alpha) = \log K + n \log t$$

Where Mt is the amount of released oil at time t; M α is the total amount of released oil; K is a release constant; n is the release exponent.

(A)

Log t	Log Mt/Mo
0.30	1.37
0.60	1.63
0.78	1.79
0.90	1.90
1.00	1.95
1.08	1.97
1.15	1.98
1.20	1.99
1.26	1.99
1.30	1.99
1.34	1.99
1.38	1.99

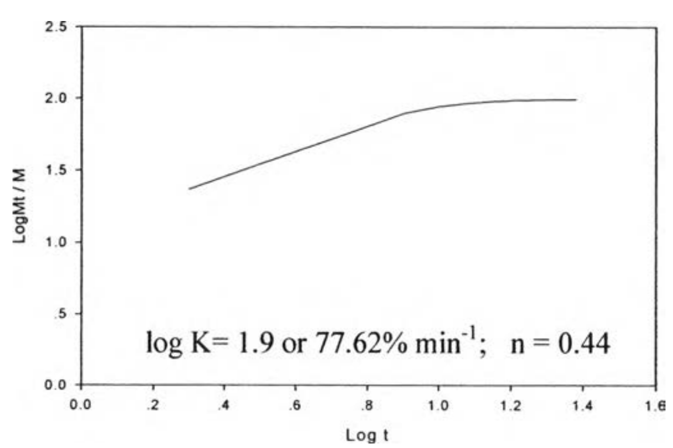

Figure C2(A) Log Mt/M against Log t of the release data of the oil-incorporated silk fibroin sheet without coating.

(B)

Log t	Log Mt/Mo
0.30	1.09
0.48	1.38
0.60	1.55
0.70	1.67
0.78	1.76
0.85	1.83
0.90	1.88
0.95	1.92
1.04	1.94
1.11	1.96
1.18	1.97
1.23	1.98
1.30	1.98
1.34	1.98
1.38	1.98
1.41	1.98
1.45	1.98

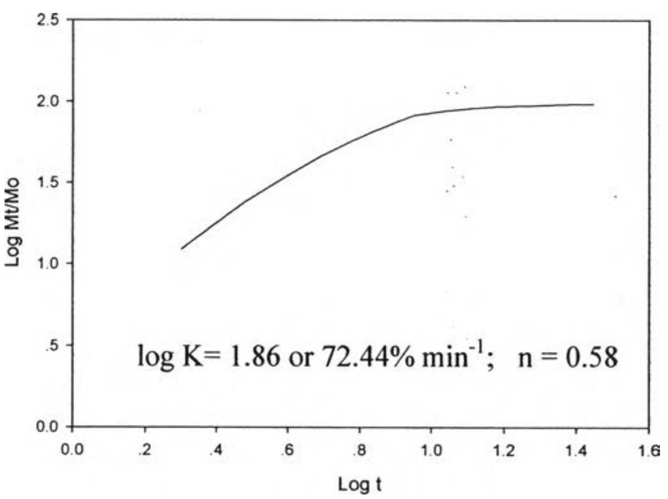

Figure C2 (B) Log Mt/M against Log t of the release data of single-coating layer of methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet.

(C)

Log t	Log Mt/Mo
0.30	1.35
0.60	1.58
0.78	1.72
0.90	1.77
1.00	1.81
1.08	1.84
1.15	1.87
1.20	1.89
1.26	1.91
1.30	1.93
1.34	1.95
1.38	1.97
1.41	1.97
1.45	1.98
1.48	1.98

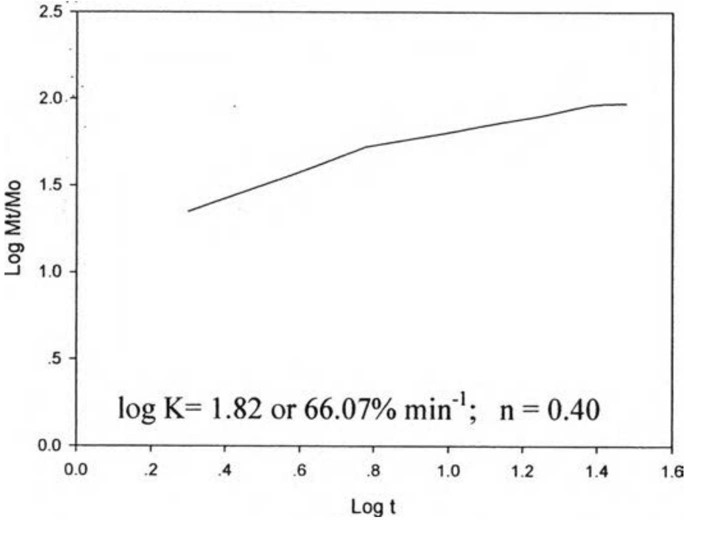

Figure C2 (C) Log Mt/M against Log t of the release data of double-coating layer of methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet.

(D)

Log t	Log Mt/Mo
0.30	0.79
0.60	1.16
0.78	1.32
0.90	1.46
1.00	1.55
1.08	1.62
1.15	1.69
1.20	1.75
1.26	1.80
1.30	1.84
1.34	1.88
1.38	1.90
1.43	1.92
1.48	1.94
1.52	1.94
1.56	1.94
1.59	1.94
1.62	1.94

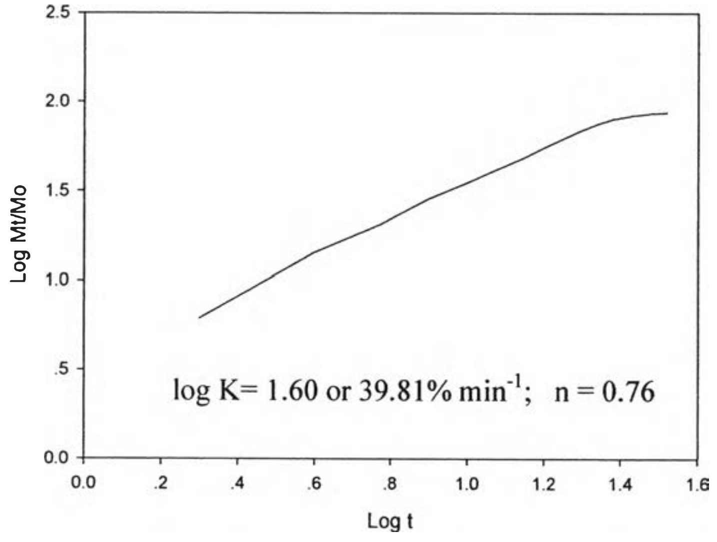

Figure C2 (D) Log Mt/M against Log t of the release data of Triple-coating layer of methanol-treated silk fibroin film on the oil-incorporated silk fibroin sheet.

APPENDIX D Weight loss the methanol-treated oil-incorporated silk fibroin sheet.

Time	% Weight loss			Average	Standard deviation
2	18.94	15.01	17.35	17.10	1.98
4	21.16	19.28	19.99	20.14	0.95
6	19.92	20.00	20.17	20.03	0.13
8	21.31	22.23	21.11	21.55	0.60
10	22.60	22.58	21.68	22.29	0.53
12	22.46	23.67	22.65	22.93	0.65
14	21.54	23.35	23.46	22.78	1.07
16	22.72	23.00	23.45	23.05	0.37
18	20.17	23.54	24.35	22.69	2.21
20	21.29	24.99	24.18	23.49	1.94
22	21.01	22.55	25.33	22.96	2.19
24	22.09	23.43	24.13	23.22	1.04
26	26.94	25.00	26.24	26.06	0.98
28	27.41	26.79	25.26	26.49	1.10
30	27.90	28.24	27.67	27.94	0.29

CURRICULUM VITAE

Name: Ms. Jenjira Klinkajorn

Date of Birth: June 17, 1986

Nationality: Thai

University Education:

2005-2008 Bachelor Degree of Engineering in Major of Petrochemical and Polymeric Materials, Faculty of Engineering and Industrial Technology, Silpakorn University, Nakhon Pathom, Thailand.

Honors and Scholarships:

1. Second class honor in B.Eng. (Petrochemical and Polymeric Materials), Silpakorn University.

Proceedings:

1. Klinkajorn, J.; Tamura, H.; and Rujiravanit, R. (2009, August 23-25) Preparation and Characterization of Coconut-oil Incorporated Silk Fibroin Wound Dressing. Proceedings of the 4th International Symposium in Science and Technology 2009, Osaka, Japan.
2. Klinkajorn, J.; Tamura, H.; and Rujiravanit, R. (2010, April 22) Preparation and Characterization of Coconut-oil Incorporated Silk Fibroin Wound Dressing. Proceedings of the 1st National Symposium on Petroleum, Petrochemicals, and Advanced Materials and the 16th PPC Symposium on Petroleum, Petrochemicals, and Polymers, Bangkok, Thailand.

Presentations:

1. Klinkajorn, J.; Tamura, H.; and Rujiravanit, R. (2009, August 23-25) Preparation and Characterization of Coconut-oil Incorporated Silk Fibroin Wound Dressing. Paper presented at the 4th International Symposium in Science and Technology 2009, Osaka, Japan.
2. Klinkajorn, J.; Tamura, H.; and Rujiravanit, R. (2010, April 22) Preparation and Characterization of Coconut-oil Incorporated Silk Fibroin Wound Dressing. Paper presented at the 1st National Symposium on Petroleum, Petrochemicals,

and Advanced Materials and the 16th PPC Symposium on Petroleum, Petrochemicals, and Polymers, Bangkok, Thailand.