

REFERENCES

- Anonymous, “Cellulose acetate.” 2006 <[http://en.wikipedia.org/wiki/Cellulose acetate](http://en.wikipedia.org/wiki/Cellulose_acetate)>
- Anonymous, “Curcumin.” 2007 <<http://en.wikipedia.org/wiki/Curcumin>>
- Blois, M.S. (1958) Antioxidant determination by the use of a stable free radical. *Nature*, 181, 1199-1200.
- Chen, J.C. and Soden, K.J. (2002) U.S. Patent 6500539.
- Chen, J.P., Chang, G.Y., and Chen, J.K. (2008) Electrospun collagen/chitosan nanofibrous membrane as wound dressing. *Colloid and Surface A: Physicochemical and Engineering Aspects*, 313-314, 183-188.
- Cheng, C.L., Guo, J.S., Luk, J., and Leung Koo, M.W. (2004) The healing effects of Centella extract and asiaticoside on acetic acid induces gastric ulcers in rats. *Life Science*, 74, 2237-2249.
- Debra, J.B. and Cheri, O. (1998) Wound healing: Technological innovations and market overview. 2, 1-185.
- Deitzel, J.M., Kleinmeyer, J.D., Hirvonen, J.K., and Beck Tan, N.C. (2001) Controlled deposition of electrospun poly(ethylene oxide) fibers. *Polymer*, 42, 8163-8170.
- Ding, B., Kimura, E., Sato, T., Fujita, S., and Shiratori, S. (2004) Fabrication of blend biodegradable nanofibrous nonwoven mats via multi-jet electrospinning. *Polymer*, 45, 1895-1902.
- Doshi, J. and Reneker, D.H. (1995) Electrospinning process and applications of electrospun fibers. *Journal of Electrostatics*, 35, 151–160.
- Gopinath, D., Ahmed, M.R., Gomathi, K., Chitra, K., Sehgal, P.K., and Jayakumar, R. (2004) Dermal wound healing processes with curcumin incorporated collagen films. *Biomaterials*, 25, 1911-1917.
- Griendling, K.K. (2000) NAPDH oxidase: role in cardiovascular biology and diseases. *Circulation Research*, 86, 494-501.

- Han, I., Shim K.J., Kim, J.Y., Im, S.U., Sung, Y.K., Kim, M., Kang, I.K., and Kim, J.C. (2007) Effect of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) nanofiber matrices cocultured with hair follicular epithelial and dermal cells for biological wound dressing. *Artificial Organs*, 31, 802-808.
- Han, S.O., Youk, J.H., Min, K.D., Kang, Y.O., and Park, W.H. (2008) Electrospinning of cellulose acetate nanofibers using a mixed solvent of acetic acid/water: Effects of solvent composition on the fiber diameter. *Materials Letters*, 62, 759-762.
- Haung, Z.M., Zhang, Y.Z., Kotaki, M., and Ramakrishna, S. (2003) A review on polymer nanofibers by electrospinning and their applications in nanocomposites. *Composite Science and Technology*, 63, 2223-2253.
- Hong, K.H. (2007) Preparation and properties of electrospun poly(vinyl alcohol)/silver fiber web as wound dressings. *Polymer engineering and Science*, 47, 43-49.
- Hunt, T.K., Hopf, H., and Hussain, Z. (2000) Physiology of wound healing. *Advances in Skin and Wound care*, 13, 6-11.
- Ishihara, K., Kobayashi, M., and Shinohara, I. (1983) Control of insulin permeation through a polymer membrane with responsive function for glucose. *Die Makromolekulare Chemie Rapid Communications*, 4, 327-331.
- Jaeger, R., Bergshoef, M.M., Martin, I., Batlle, C., Schoenherr, H. and Vansco, G.J. (1998) Electrospinning of ultra thin polymer fibers *Macromolecular Symposia*, 127, 141-150.
- Jayaprakasha, G.K., Jagan, L., Rao, M., and Sakariah, K.K. (2005) Chemistry and biological activities of *C. longa*. *Trends in Food Science and Technology*, 15, 533-548.
- Jayaprakasha, G.K., Rao, L.J., and Sakariah, K.K. (2006) Antioxidant activities of curcumin, demethoxycurcumin and bisdemethoxycurcumin. *Food Chemistry*, 98, 720-724.
- Kartnig, T. In: Craker, L.E., and Simon, J.E., editors. (1988) *Herbs, Spices and Medicinal Plants*. Phoenix: Oxyx Press; 1988:145-173.

- Kenawy, E.R., Bowlin, G.L., Mansfield, K., Layman, J., Simpson, D.G., Sanders, E.H., and Wnek, G.E. (2002) Release of tetracycline hydrochloride from electrospun poly(ethylene-co-vinylacetate), poly(lactic acid), and a blend. *Journal of Controlled Release*, 81, 57-64.
- Kim, K., Luu, Y.K., Chang, C., Fang, D.F., Hsiao, B.S., Chu, B., and Hadjiaargyrou, M. (2004) Incorporation and controlled release of a hydrophilic antibiotic using scaffolds. *Journal of Controlled Release*, 98, 47–56.
- Koombhongse, S. (2001) The formation of nanofibers from electrospinning process. *Doctoral Dissertation*, The University of Akron.
- Liu, H. and Hsieh, Y.L. (2002) Ultra-fine fibrous cellulose membranes from electrospinning of cellulose acetate. *Journal of Polymer Science-Polymer Physics*, 40, 2119-2129.
- Lu, E.X., Jiang, Z.Q., Zhang, Q.Z., and Jiang, X.G. (2003) A water-insoluble drug monolithic osmotic tablet system utilizing gum arabic as an osmotic, suspending and expanding agent, *Journal of Controlled Release*, 92, 375–382.
- Luong, N.D., Lee, Y., and Nam, J.D. Highly-loaded silver nanoparticles in ultrafine cellulose acetate nanofibrillar. *European Polymer Journal*, accepted.
- Luong-Van, E., Grøndahl, L., Chua, K.N., Leong, K.W., Nurcombe, V., and Cool, S.M. (2006) Controlled release of heparin from poly(ϵ -caprolactone) electrospun fibers. *Biomaterials*, 27, 2042-2050.
- Ma, Z., Kotaki, M., and Ramakrishna, S. (2005) Electrospun cellulose nanofiber as affinity membrane. *Journal of Membrane Science*, 265, 115-123.
- Maheshwari, R.K., Singh, A.K., Gaddipati, J., and Srimal, R.C. (2006) Multiple biological activities of curcumin: A short review. *Life Science*, 78, 2081-2087.
- Makhija, S.N. and Vavia, P.R. (2003) Controlled porosity osmotic pump-based controlled release systems of pseudoephedrine I. Cellulose acetate as a semipermeable membrane, *Journal of Controlled Release*, 89, 5–18.
- Maquart, F.X., Bellon, G., Gillery, P., Wegrowski, Y., and Borel, J.P. (1990) Stimulation of collagen synthesis in fibroblast cultures by a triterpene extracted from *Centella asiatica*. *Connective Tissue Research*, 24, 107-120.

- Maquart, F.X., Chastang, F., Simeon, A., Birembaut, P., Gillary, P., and Wegrowski, Y. (1999) Triterpenes from *Centella asiatica* stimulate extracellular matrix accumulation in rat experimental wounds. European Journal of Dermatology, 9, 289-296.
- Mark, H.F., Bikales, N.M., Overberger, C.G., and Menges, G. (1985) Encyclopedia of polymer science and engineering, New York: Wiley-Interscience.
- Matsuda, K., Suzuki, S., Isshiki, N., Yoshioka, K., Wada, R., Okada, R., Ikada, Yoshito. (1990) Influence of glycosaminoglycan on the collagen sponges component of a bilayer artificial skin. Biomaterials, 11, 351-355.
- Michelson, D. (1990) Electrostatic Atomization, New York: Adam Hilger.
- Min, B.M., Lee, G., Kim, S.H., Nam, Y.S., Lee, T.S., and Park, W.H. (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.
- Morgan, D. (2002) Wounds-what should a dressings formulary include? Hospital Pharmacist, 9, 261-266.
- Noh, H.K., Lee, S.W., Kim, J.M., Oh, J.E., Kim, K.H., Chung, C.P., Choi, S.C., and Min, B.M. (2006) Electrospinning of chitin nanofibers: Degradation behavior and cellular response to normal human keratinocytes and fibroblast. Biomaterials, 27, 3934-3944.
- Panchatcharam, M., Miriyala, S., Gayathri, V.S., and Suguna, L. (2006) Curcumin improves wound healing by modulating collagen and decreasing reactive oxygen species. Molecular and Cellular Biochemistry, 290, 87-96.
- Peppas, L.B. (1997) Polymers in Controlled Drug Delivery. Medical Plastics and Biomaterials, 34-45.
- Rama Rao, P. and Diwan, P.V. (1997) Permeability studies of cellulose acetate free films for transdermal use: Influence of plasticizers. Pharmaceutica Acta Helvetiae, 72, 47-51.
- Reneker, D.H. and Chun, I. (1996) Nanometre diameter fibres of polymer, produced by electrospinning. Nanotechnology, 7, 216-223
- Reneker, D.H., Yarin, A.L., Fong, H., and Koombhongse, S. (2000) Bending instability of electrically charged liquid jets of polymer. Journal of Applied Physics, 87 (9), 4531-4546.

- Rho, K.S., Jeong, L., Lee, G., Seo, B.M., Park, Y.J., Hong, S.D., Roh, S., Park, W.H., and Min, B.M. (2006) Electrospinning of collagen nanofibers: Effects on the behavior of normal human keratinocytes and early-stage wound healing. *Biomaterial*, 27, 1452-1461.
- Santus, G. and Baker, R.W. (1995) Osmotic drug delivery: a review of the patent literature. *Journal of Controlled Release*, 35, 1-21.
- Sharma, R.A., Gescher, A.J., and Steward, W.P. (2005) Curcumin: The story so far. *European Journal of Cancer*, 41, 1955-1968.
- Shim, P.J., Park, J.H., Chang, M.S., Lim, M.J., Kim, D.H., Jung, Y.H., Jew, S.S. Park, E.H., and Kim, H.D. (1996) Asiaticoside-mimetics as wound healing agent. *Bioorganic and Medicinal Chemistry Letters*, 6, 2937-2940.
- Shin, Y.M., Hohman, M.M., Brenner, M.P., and Rutledge, G.C. (2001) Experimental characterization of electrospinning: the electrically forced jet and instabilities. *Polymer*, 42, 9955-9967.
- Shukla, A., Rasik, A.M., and Dhawan, B.N. (1999) Asiaticoside-induced elevation of antioxidant levels in healing wounds. *Phytotherapy Research*, 13, 50-54.
- Sidhu, G.S., Mani, H., Gaddipati, J.P., Singh, A.K., Seth, P., Banaudha, K.K., Patnaik, G.K., and Maheshwari, R.K. (1999) Curcumin enhances wound healing in streptozotocin induced diabetic rats and genetically diabetic mice. *Wound Repair and Regeneration*, 7, 362-374.
- Son, W.K., Youk, J.H., and Park, W.H. (2006) Antimicrobial cellulose acetate nanofibers containing silver nanoparticles. *Carbohydrate Polymers*, 65, 430-434.
- Son, W.K., Youk, J.H., Lee, T.S., and Park, Y.H. (2004) Electrospinning of ultrafine cellulose acetate fibers: Studies of a new solvent system and deacetylation of ultrafine cellulose acetate fibers. *Journal of Polymer Science Part B-Polymer Physics*, 42, 5-11.
- Suguna, L., Sivakumar, P., and Chandrakasan, G. Effects of centella asiatica extract on dermal wound healing in rats. *Indian Journal of Experimental Biology*, 34, 1208-1211.

- Suwantong, O., Opanasopit, P., Ruktanoncha, U., and Supaphol, P. (2007) Electrospun cellulose acetate fiber mats containing curcumin and release characteristic of the herbal substance. *Polymer*, 48, 7546-7557.
- Suwantong, O., Waleetorncheepsawat, S., Sanchavanakit, N., Pavasant, P., Cheepsunthorn, P., Bunaprasert, T., and Supaphol, P. (2007) In vitro biocompatibility of electrospun poly(3-hydroxybutyrate), poly(3-hydroxybutyrate-co-3-hydroxyvalerate) fiber mats. *International Journal of Biological Macromolecules*, 40, 217-223.
- Suzuki, S., Matsuda, K., Isshiki, N., Tamada, Y., and Ikada, Y. (1990) Experimental study of newly developed bilayer artificial skin. *Biomaterials*, 11, 356-360.
- Taepaiboon, P., Rungsardthong, U., and Supaphol, P. (2006) Drug-loaded electrospun mats of poly(vinyl alcohol) fibres and their release characteristics of four model drugs. *Nanotechnology*, 17, 2317-2329.
- Taepaiboon, P., Rungsardthong, U., and Supaphol, P. (2007) Vitamin-loaded electrospun cellulose acetate nanofiber mats as transdermal and dermal therapeutic agents of vitamin A acid and vitamin E. *European Journal of Pharmaceutics and Biopharmaceutics*, 67, 387-397.
- Taylor, G. (1969) Electrically driven jets. *Proceedings of the Royal Society of London*, A313, 453-475.
- Tungprapa, S., Jangchud, I., and Supaphol, P. (2007) Release characteristics of four model drugs from drug-loaded electrospun cellulose acetate fiber mats. *Polymer*, 48, 5030-5041.
- Verreck, G., Chun, I., Rosenblatt, J., Peeters, J., Dijck, A.V., Mensch, J., Noppe, M., and Brewster, M.E. (2003) Incorporation of drugs in an amorphous state into electrospun nanofibers composed of a water-insoluble. *Journal of Controlled Release*, 92, 349-360.
- Wang, F.J., Yang, Y.Y., Zhang, X.Z., Zhu, X., Chung, T.S., and Moochhala, S. (2002) Cellulose acetate membranes for transdermal delivery of scopolamine base. *Materials Science and Engineering C*, 20, 93-100.
- Wiseman, H. and Halliwell, B. (1996) Damage to DNA by reactive oxygen and nitrogen species: role in inflammatory disease and progression to cancer. *Biochemical Journal*, 313, 17-29.

- Wutticharoenmongkol, P., Sanchavanakit, N., Pavasant, P., and Supaphol, P. (2006) Novel bone scaffolds of electrospun polycaprolactone fibers filled with nanoparticles. *Journal of Nanoscience and Nanotechnology*, 6, 514–522.
- Xu, X., Chen, X., Xu, X., Lu, T., Wang, X., Yang, L., and Jing, X. (2006) BCNU-loaded PEG-PLLA ultrafine fibers and their in vitro antitumor activity against Glioma C6 cells. *Journal of Controlled Release*, 114, 307-316.
- Yoshimoto, H., Shin, Y.M., Terai, H., and Vacanti, J.P. (2003) A biodegradable nanofiber scaffold by electrospinning and its potential for bone tissue engineering. *Biomaterials*, 24, 2077-2082.
- Zeng, J., Xu, X., Chen, X., Liang, Q., Bian, X., Yang, L., and Jing, X. (2003) Biodegradable electrospun fibres for drug delivery. *Journal of Controlled Release*, 92, 227–231.
- Zhou, H.Y., Chen, X.G., Liu, C.H., Meng, X.H., Liu, C.G., and Yu, L.J. (2006) Release characteristics of three model drugs from chitosan/cellulose acetate multimicrospheres. *Biomchemical Engineering Journal*, 31, 228-233.
- Zong, X.H., Kim, K., Fang, D.F., Ran, S.F., Hsiao, B.S., and Chu, B. (2002) Structure and process relationship of electrospun bioabsorbable nanofiber membranes. *Polymer*, 43, 4403-4412.



CURRICULUM VITAE

Name: Ms. Orawan Suwantong

Date of Birth: October 18, 1981

Nationality: Thai

University Education:

2000-2003 Bachelor Degree of Industrial Chemistry, Faculty of Science,
Chiang Mai University, Chiang Mai, Thailand

Publications:

1. Suwantong, O. and Supaphol, P. Electrospinning and crosslinking of zein fiber mats with glyoxal solution, in preparation.
2. Sangsanoh, P., Suwantong, O., Neammark, A., Cheepsunthorn, P., Pavasant, P., and Supaphol, P. In vitro biocompatibility of electrospun and solvent-cast chitosan substrate towards four different cell lineages, *Biomacromolecules*, submitted.
3. Suwantong, O., Ruktanonchai, U., Pavasant, P., and Supaphol, P. In vitro biological evaluation of electrospun cellulose acetate fiber mats containing curcumin or asiaticoside, *Biomacromolecules*, submitted.
4. Mattanavee, W., Suwantong, O., Puthong, S., Bunaprasert, T., Hoven, V.P., and Supaphol, P. Immobilization of biomolecules on surface of electrospun polycaprolactone fibrous scaffolds for tissue engineering, *Biomacromolecules*, submitted.
5. Suwantong, O., Ruktanonchai, U., and Supaphol, P. (2008) Electrospun cellulose acetate fiber mats containing asiaticoside or centella asiatica crude extract and the release characteristics of asiaticoside. *Polymer*, 49(19), 4239-4247.
6. Opanasopit, P., Ruktanonchai, U., Suwantong, O., Panomsuk, S., Ngawhirunpat, T., Sittisombat, C., Suksamran, T., and Supaphol, P. (2008) Electrospun poly(vinyl alcohol) fiber mats as carriers for extracts from fruit hull of mangosteen. *Journal of Cosmetic Science*, 59(3), 233-242.
7. Hariraksapitak, P., Suwantong, O., and Pavasant, P., and Supaphol, P. (2008) Effectual drug-releasing porous scaffolds from 1,6-diisocyanatohexane-extended

- poly(1,4-butylene succinate) for bone tissue regeneration. *Polymer*, 49(11), 2678-2685.
8. Suwantong, O., Opanasopit, P., Ruktanonchai, U., and Supaphol, P. (2007) Electrospun cellulose acetate fiber mats containing curcumin and release characteristic of herbal substance. *Polymer*, 48(26), 7546-7557.
 9. Sangsanoh, P., Waleetorncheepsawat, S., Suwantong, O., Wutticharoenmongkol, P., Weeranantanapan, O., Chuenjatkuntaworn, B., Cheepsunthorn, P., Pavasant, P., and Supaphol, P. (2007) In vitro biocompatibility of schwann cells on surfaces of biocompatible polymeric electrospun fibrous and solution-cast film scaffolds. *Biomacromolecules*, 8(5), 1587-1594.
 10. Suwantong, O., Waleetorncheepsawat, S., Sanchavanakit, N., Pavasant, P., Cheepsunthorn, P., Bunaprasert, T., and Supaphol, P. (2007) In vitro biocompatibility of electrospun poly(3-hydroxybutyrate) and poly(3-hydroxybutyrate-co-3-hydroxyvalerate) fiber mats. *International Journal of Biological Macromolecules*, 40(3), 217-223.
 11. Sombatmankhong, K., Suwantong, O., Waleetorncheepsawat, S., and Supaphol, P. (2006) Electrospun fiber mats of poly(3-hydroxybutyrate), poly(3-hydroxybutyrate-co-3-hydroxyvalerate), and their blends. *Journal of Polymer Science- B: Polymer Physics*, 44(19), 2923-2933.

Presentations:

1. Suwantong, O., Sanchavanakit, N., Pavasant, P., Bunaprasert, T., and Supaphol, P. (2006, September 10-13) In vitro biocompatibility of electrospun poly(3-hydroxybutyrate) and poly(3-hydroxybutyrate-co-hydroxyvalerate) fiber mats. Paper presented at International Conference and Exhibition on Bioplastics Technologies and Market Towards the MDGs (Inno Bioplast 2006), Bangkok, Thailand.
2. Suwantong, O., Sanchavanakit, N., Pavasant, P., Bunaprasert, T., and Supaphol, P. (2006, October 10-13) In vitro biocompatibility of electrospun poly(3-hydroxybutyrate) and poly(3-hydroxybutyrate-co-hydroxyvalerate) fiber mats. Paper presented at International Symposium on Advanced Polymers for Emerging Technologies (IUPAC), Busan, Korea.
3. Suwantong, O., Rungsardthong, U., and Supaphol, P. (2007, June 25-28) Curcumin-loaded electrospun mats of cellulose acetate fibers and their release characteristics. Paper presented at The 2nd International Conference on Advances in Petrochemicals and Polymers, Bangkok, Thailand.
4. Suwantong, O., Rungsardthong, U., and Supaphol, P. (2007, July 1-6) Curcumin-loaded electrospun mats of cellulose acetate fibers and their release characteristics. Paper presented at International Conference on Materials for Advanced Technologies (ICMAT), Singapore.
5. Suwantong, O., Ruktanonchai, U., and Supaphol, P. (2007, December 4-7) Incorporation and modified release of antioxidant curcumin using cellulose acetate based electrospun nanofiber. Paper presented at The 10th Pacific Polymer Conference (PPC 10), Kobe, Japan.