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Professor

B.S. in Chemical Engineering
National Taiwan University, 1989
M.S. in Biochemical Sciences
National Taiwan University, 1991
Ph.D. in Bioengineering
University of Washington, 1998

Research and Professional Interests
Biomaterials
Tissue engineering
Drug delivery

Journal Papers

1. T. C. Lai, J. Yu and **W. B. Tsai**, "Gelatin methacrylate/carboxybetaine methacrylate hydrogels with tunable crosslinking for controlled drug release", *J Mater Chem B* 4, 2304-2313, (2016)

2. W. H. Lin, J. S. Yu, G. P. Chen and **W. B. Tsai**, "Fabrication of multi-biofunctional gelatin-based electrospun fibrous scaffolds for enhancement of osteogenesis of mesenchymal stem cells", *Colloid Surface B* 138, 26-31, (2016)

3. **W. B. Tsai**, Y. Long, J. R. Park, J. T. Chang, H. Liu, J. Rodriguez-Canales, N. Savaraj, L. G. Feun, M. A. Davies, I. I. Wistuba and M. T. Kuo, "Gas6/Axl is the sensor of arginine-auxotrophic response in targeted chemotherapy with arginine-depleting agents", *Oncogene* 35, 1632-1642, (2016)

4. C. J. Wang and **W. B. Tsai**, "Microstrip Open-Slot Antenna With Broadband Circular Polarization and Impedance Bandwidth", *Ieee T Antenn Propag* 64, 4095-4098, (2016)

5. I. N. Ahmed, R. Chang and **W. B. Tsai**, "Poly(acrylic acid) nanogel as a substrate for cellulase immobilization for hydrolysis of cellulose", *Colloid Surface B* 152, 339-343, (2017)

6. P. R. Chen, T. C. Wang, S. T. Chen, H. Y. Chen and **W. B. Tsai**, "Development of Antifouling Hyperbranched Polyglycerol Layers on Hydroxyl Poly-p-xylylene Coatings", *Langmuir* 33, 14657-14662, (2017)

7. H. W. Chien, P. H. Cheng, S. Y. Chen, J. S. Yu and **W. B. Tsai**, "Low-fouling and functional poly(carboxybetaine) coating via a photo-crosslinking process", *Biomater Sci-Uk* 5, 523-531, (2017)

8. H. W. Chien, J. S. Yu, S. T. Li, H. Y. Chen and **W. B. Tsai**, "An in situ poly(carboxybetaine) hydrogel for tissue engineering applications", *Biomater Sci-Uk* 5, 322-330, (2017)

9. Y. Long, **W. B. Tsai**, D. J. Wang, D. H. Hawke, N. Savaraj, L. G. Feun, M. C. Hung, H. H. W. Chen and M. T. Kuo, "Argininosuccinate synthetase 1 (ASS1) is a common metabolic marker of chemosensitivity for targeted arginine- and glutamine-starvation therapy", *Cancer Lett* 388, 54-63, (2017)

10. S. S. Nievethitha, N. Subhapradha, D. Saravanan, N. Selvamurugan, **W. B. Tsai**, N. Srinivasan, R. Murugesan and A. Moorthi, "Nanoceramics on osteoblast proliferation and differentiation in bone tissue engineering", *Int J Biol Macromol* 98, 67-74, (2017)

11. **W. B. Tsai**, Y. Long, J. T. Chang, N. Savaraj, L. G. Feun, M. Jung, H. H. W. Chen and M.

T. Kuo, “Chromatin remodeling system p300-HDAC2-Sin3A is involved in Arginine Starvation-Induced HIF-1 alpha Degradation at the ASS1 promoter for ASS1 Derepression”, *Sci Rep-Uk* 7, (2017)

12. P. Y. Wang, Y. S. Lian, R. Chang, W. H. Liao, W. S. Chen and **W. B. Tsai**, “Modulation of PEI-Mediated Gene Transfection through Controlling Cytoskeleton Organization and Nuclear Morphology via Nanogrooved Topographies”, *Acs Biomater Sci Eng* 3, 3283-3291, (2017)

13. R. Chang, C. F. Hsu and **W. B. Tsai**, “Fabrication of Chlorophyll-Incorporated Nanogels for Potential Applications in Photothermal Cancer Therapy”, *Acs Omega* 3, 16057-16062, (2018)

14. R. Chang and **W. B. Tsai**, “Fabrication of Photothermo-Responsive Drug-Loaded Nanogel for Synergetic Cancer Therapy”, *Polymers-Basel* 10, (2018)

15. C. W. Lin, K. C. Yang, N. C. Cheng, **W. B. Tsai**, K. L. Lou and J. S. Yu, “Evaluation of adhesion, proliferation, and differentiation of human adipose-derived stem cells on keratin”, *J Polym Res* 25, (2018)

16. W. H. Lin, C. Y. Lin, C. C. Tsai, J. S. Yu and **W. B. Tsai**, “Spheroid Formation of Human Adipose-Derived Stem Cells on Environmentally Friendly BMA/SBMA/HEMA Copolymer-Coated Anti-Adhesive Surface”, *B Chem Soc Jpn* 91, 1457-1464, (2018)

17. M. Lu, Y. Liu, Y. C. Huang, C. J. Huang and **W. B. Tsai**, “Fabrication of photo-crosslinkable glycol chitosan hydrogel as a tissue adhesive”, *Carbohyd Polym* 181, 668-674, (2018)

18. S. K. Rajendrakumar, N. C. Chang, A. Mohapatra, S. Uthaman, B. I. Lee, **W. B. Tsai** and I. K. Park, “A Lipophilic IR-780 Dye-Encapsulated Zwitterionic Polymer-Lipid Micellar Nanoparticle for Enhanced Photothermal Therapy and NIR-Based Fluorescence Imaging in a Cervical Tumor Mouse Model”, *Int J Mol Sci* 19, (2018)

19. Y. J. Yang, X. L. Wang, T. C. Huang, X. H. Hu, N. Kawazoe, **W. B. Tsai**, Y. N. Yang and G. P. Chen, “Regulation of mesenchymal stem cell functions by micro-nano hybrid patterned surfaces”, *J Mater Chem B* 6, 5424-5434, (2018)

20. I. N. Ahmed, R. Chang, M. C. Keng, H. W. Chien, H. Y. Chen and **W. B. Tsai**, “Immobilization of functional polymers on poly(4-benzoyl-pxylylene-co-p-xylylene) films via photochemical conjugation for modulation of cell adhesion”, *Colloid Surface B* 174, 360-366, (2019)

21. W. H. Chen, T. Y. Liao, H. Thissen and **W. B. Tsai**, “One-Step Aminomalononitrile-Based Coatings Containing Zwitterionic Copolymers for the Reduction of Biofouling and the Foreign Body Response”, *Acs Biomater Sci Eng* 5, 6454-6462, (2019)

22. Q. H. Cui, T. H. Le, Y. J. Lin, Y. B. Miao, I. T. Sung, **W. B. Tsai**, H. Y. Chan, Z. H. Lin and H. W. Sung, “A self-powered battery-driven drug delivery device that can function as a micromotor and galvanically actuate localized payload release”, *Nano Energy* 66, (2019)

23. Y. Liu, S. C. Ng, J. S. Yu and **W. B. Tsai**, “Modification and crosslinking of gelatin-based biomaterials as tissue adhesives”, *Colloid Surface B* 174, 316-323, (2019)

24. P. T. Wu, C. L. Lin, C. W. Lin, N. C. Chang, **W. B. Tsai** and J. S. Yu, “Methylene-Blue-

Encapsulated Liposomes as Photodynamic Therapy Nano Agents for Breast Cancer Cells", *Nanomaterials-Basel* 9, (2019)

25. Yeh, Shang-Lin; Deval, Piyush; Wu, Jhih-Guang; Luo, Shyh-Chyang; **Tsai, Wei-Bor**, One-step electrochemical deposition of antifouling polymers with pyrogallol for biosensing applications, *Journal Of Materials Chemistry B*, 2021

26. Yeh, Shang-Lin; Wang, Ting-Ching; Yusa, Shin-ichi; Thissen, Helmut; **Tsai, Wei-Bor**, Conjugation of Polysulfobetaine via Poly(pyrogallol) Coatings for Improving the Antifouling Efficacy of Biomaterials, *Acs Omega*, 5(3517),3524-9, Feb 2021.

27. Wang, Ting-Ching; **Tsai, Wei-Bor**, A biphasic mathematical model for the release of polymer-drug conjugates from poly(vinyl alcohol) hydrogels, *Journal Of The Taiwan Institute Of Chemical Engineers*, 135, 2022 FEB.

28. Deval, Piyush; Lin, Chia-Hsuan; **Tsai, Wei-Bor**, Fabrication of Polysulfobetaine Gradient Coating via Oxidation Polymerization of Pyrogallol To Modulate Biointerfaces, *Acs Omega*, 7(8),7125-7133, 2022 SEP.

29. Chien, Hsiu-Wen; Wu, Jen-Chia; Chang, Ying-Chih; **Tsai, Wei-Bor**, Polycarboxybetaine-Based Hydrogels for the Capture and Release of Circulating Tumor Cells, *Gels*, 8(7), 2022 DEC

30. Sun, Yi-Chen; Wu, Li-Li; Chang, Yu-An; Li, Tzu-Yun; Lin, Yang; Hu, Fung-Rong; **Tsai, Wei-Bor**; Hung, Kai-Feng, Zwitterionic poly(carboxybetaine methacrylate) (polyCBMA) decreases desiccating damage to corneal epithelial cells, *Colloid And Interface Science Communications*, 50, 2022 MAR.

31. Ilona Uzieliene, Daiva Bironaite, Jolita Pachaleva, Edvardas Bagdonas, Arkadij Sobolev, Wei-Bor Tsai, Giedrius Kvedaras, Eiva Bernotiene. Chondroitin Sulfate-Tyramine-Based Hydrogels for Cartilage Tissue Repair. Int J Mol Sci. 2023. 24(4):3451. doi: 10.3390/ijms24043451.

32. Ilona Uzieliene, Daiva Bironaite, Edvardas Bagdonas, Jolita Pachaleva, Arkadij Sobolev, Wei-Bor Tsai, Giedrius Kvederas, Eiva Bernotiene. The Effects of Mechanical Load on Chondrogenic Responses of Bone Marrow Mesenchymal Stem Cells and Chondrocytes Encapsulated in Chondroitin Sulfate-Based Hydrogel. Int J Mol Sci. 2023. 24(3):2915. doi: 10.3390/ijms24032915.

33. Tsai WB, Ahmed IN. The Impact of Polyethylene Glycol-Modified Chitosan Scaffolds on the Proliferation and Differentiation of Osteoblasts. Int J Biomater. 2023:4864492. doi: 10.1155/2023/4864492.

Conference Papers

1. **Wei-Bor Tsai**, "A Simple One-step Deposition of Zwitterionic Polymer for Providing Biomaterials' Antifouling Ability via Aminomalononitrile Polymerization", 2017 AIChE Annual Meeting, 2017/10/28-2017/11/03, Minneapolis, Minnesota, USA.

2. **Wei-Bor Tsai**, "Facile methods for conjugation of anti-fouling zwitterionic polymers to biomaterials", 3rd International Conference on Bioinspired and Zwitterionic Materials (ICBZM2017), 2017/10/18-20, Tokyo, Japan (Invited speaker)

3. **Wei-Bor Tsai**, "Applications of cellulose nanocrystals", VNIWAST2017, 2017/12/21-22, Ho Chi Minh City, Vietnam (Invited speaker)

4. **Wei-Bor Tsai**, "In-situ Crosslinkable Biopolymers for Biomedical Applications", ICBP2017, 2017/5/14-17, Tauyuan, Taiwan. (Invited speaker)

5. **Wei-Bor Tsai**, "Photo-induced thermal-responsive nanogels for controlled drug release", 5th International Conference on Multifunctional, Hybrid and Nanomaterials, 2017/3/6-10, Lisbon, Portugal.

6. **Wei-Bor Tsai**, "Bioinspired adhesive chemistry for biomedical applications", Asian Engineering Deans' Forum Workshop on Bioengineering, 2017/3/10-11, Singapore. (Invited speaker)

7. **Wei-Bor Tsai**, "“Copper chlorophyllin-containing nanogels for photothermal therapy", Fourteenth International Workshop on Supramolecular Nanoscience of Chemically Programmed Pigments (SNCPP19), 2019/06/14-16, Ritsumeikan University, Kusatsu, Shiga, Japan. (Invited speaker)

8. **Wei-Bor Tsai**, "Surface Deposition of Anti-fouling Polymers via Pyrogallol-mediated Reaction for Anti-fouling Treatment", Advanced Biomaterials and Medical Membranes Symposium - Bio-inspired Interfaces and Membranes, 2019/10/26, CYCU, Taoyuan, Taiwan. (Invited speaker)

Books

1. Peng-Yuan Wang and **Wei-Bor Tsai**. Chapter 11: Stem-Cell Responses to Surface Nanotopographies. In Stem-Cell Nanoengineering. Editors: Hossein Baharvand and Nasser Aghdami. John Wiley & Sons, Inc. 2015.

Patents

1. 「使用一裝置在製造一醫藥用品上之用途、製造一供修補一主體中害病的或受損的組織之裝置的方法以及具類似組織特性之裝置」, 中華民國專利, 證書號：I258372, 2006/07/21-2022/02/03.