

# JIE FU

## CURRICULUM VITAE

Johns Hopkins University, Departments of Chemical Engineering & Biomolecular Engineering  
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### **EDUCATION**

- 1996      Ph.D., Polymer Chemistry and Physics, Department of Chemistry, Wuhan University, China
- 1988      M. Sc. Polymer Chemistry, Department of Chemistry, Peking University, Beijing, China
- 1985:      B. Sc. Polymer Chemistry, Department of Chemistry, Wuhan University, Wuhan, China

### **PROFESSIONAL EXPERIENCE**

#### *Research Experience*

Sep. 2002 – present: **Associate Research Scientist**

Sep. 2000 – Sep. 2002: **Postdoctoral Research Fellow**

Department of Chemical Eng.

The Johns Hopkins University, Baltimore, MD

Research Areas: Design and synthesis of new biodegradable polymers for pulmonary drug delivery, gene therapy, and cancer vaccination.

Sep. 1997 – Sep. 2000

**Associate Professor**

School of Material Sci. & Eng.

Wuhan University of Technology, Wuhan, China

Research Areas: Biodegradable polymers and biodegradable polymer/hydroxyapatite polymercomposite materials for implantation and bone repair.

Jan. 1999 – Jan. 2000:

**Postdoctoral Research Fellow**

Department of Chemistry

Chinese University of Hong Kong, Hong Kong

Research Areas: Laser light scattering studies of biodegradable polymeric nanoparticles for drug delivery.

Dec. 1990 – Sep. 1997:

**Lecturer/Researcher**

School of Material Sci. & Eng.

Wuhan University of Technology, Wuhan, China

Research Areas: Biodegradable polymers for anticancer drug delivery & fiber reinforced plastic composite materials.

July 1988 – Dec. 1990:

**Teacher/Researcher**

School of Material Sci. & Eng.

Wuhan University of Technology, Wuhan, China

Research Areas: Polymer & fiber reinforced plastic composite materials.

Sep. 1985 – July 1988:

**Research Assistant**

Department of Chemistry

Peking University, Beijing, China

Research Areas: Initiator System of MMA polymerization used in dental materials.

Jan. 1985– July 1985:

**Research Assistant**

Department of Chemistry

Wuhan University, Wuhan, China

Research Areas: Synthesis and study on UV-Curing Poly(perfluoroalkoxypropylmethyl-siloxane

***Teaching Experience***

Wuhan University of Technology, Wuhan, China

Courses taught independently with full responsibilities from syllabus, lecturing, grading.

Courses for graduate students:

Biomedical Polymer Materials (new course)

Courses for undergraduate students:

Polymer Chemistry

Polymer Physics

Functional Polymers (new course)

Modern Techniques of Detection and Characterization of Polymers

Polymer Synthesis (laboratory course)

**PROFESSIONAL SOCIETIES**

Member, Biomedical Engineering Society

Member, The Controlled Release Society

Member, The American Institute of Chemical Engineers

## REFEREE

1. Journal of the American Chemical Society
2. Journal of Pharmacy and Pharmacology
3. Biomacromolecules
4. Journal of Wuhan University of Technology -- Materials Science Edition

## PUBLICATIONS

1. **Fu J.**, Krauland E., Harel Y., Hanes J., Synthesis, characterization, and self-assembly with plasmid DNA of novel aspartic anhydride-co-ethylene glycol copolymers: New degradable cationic polymers for gene delivery, *to be submitted*.
2. **Fu J.**, Sakhalkar H.S., Goetz D.J., Hanes J. New biodegradable polymers for highly selective drug targeting to inflamed tissues, *to be submitted*
3. Sakhalkar H.S., Hanes, J., **Fu, J.**, Benavides, U., Malgor, R., Borruso, C. L., Kohn, L. D., Kurjiaka, D. T., Goetz, D. J. Enhanced adhesion of ligand-conjugated biodegradable particles to colitic venules. *FASEB Journal*, 2005, 19, 792-794.
4. Suk J.S., Suh J., Choy K., Lai S.K., **Fu J.**, and Hanes J., Gene delivery to differentiated neurotypic cells with RGD and HIV Tat peptide functionalized polymeric nanoparticles. *Biomaterials*, 2006, 27, 5143-5150
5. **Fu J.**, Fiegel J., Hanes J., Synthesis and characterization of PEG-based ether-anhydride terpolymers: New polymers designed for controlled pulmonary drug delivery. *Macromolecules*, 2004, 37:7174-7180.
6. Li H., Yuan Z., Lam KY, Lee H.P., Chen J., Hanes J., **Fu J.**, Model development and numerical simulation of electric-stimulus-responsive hydrogels subject to an externally applied electric field. *Biosensors and Bioelectronics*, 2004, 19:1097-1107
7. Fiegel J., **Fu J.**, Hanes J., Poly(ether-anhydride) dry powder aerosols for sustained drug delivery in the lungs. *J. Controlled release*, 2004, 96:411-423.
8. Sakhalkar HS, Dalal MK, Salem AK, Ansari R, **Fu J**, Kiani MF, Kurjiaka DT, Hanes J, Shakesheff K.M., Goetz D.J., Leukocyte inspired biodegradable particles that selectively and avidly adhere to inflamed endothelium in vitro and in vivo, *Proc Natl Acad Sci*, 2003, 100:15895-15900

9. Li H., Yuan Z., Ng T.Y., Lee H.P., Lam K.Y., Wang Q.X., Wu S., **Fu J.**, Hanes J., Constitutive model development and micro-structural topology optimization for Nafion hydrogel membranes with ionic clustering, *J Biomater Sci Polymer Edn*, 2003, 14:1181-1196.
10. **Fu J.**, Fiegel J., Krauland E., Hanes J., New polymeric carriers for controlled drug delivery following inhalation or injection. *Biomaterials*, 2002, 23:4425-4433.
11. **Fu J.**, Li X.Y., Ng D. K. P., Wu C., Encapsulation of phthalocyanines in biodegradable poly(sebacic anhydride) nanoparticles, *Langmuir*, 2002, 18:3843-3847.
12. **Fu J.**, Wu C., A novel laser light-scattering study of degradation of poly(sebacic anhydride) nanoparticles. *Journal of Polymer Science, Part B: Polymer Physics*, 2001, 39:703-708.
13. Wu C., **Fu J.**, Zhao Y., Biodegradation of poly(ethylene oxide-*b*-sebacic anhydride) diblock copolymer and its potential biomedical applications. *Macromolecules*, 2000, 33:9040-9043.
14. **Fu J.**, Li S. P., Progress in research on polymer materials for controlled drug release. *The Development of Materials Research*. 1999, 13(6): 52-54.
15. **Fu J.**, Li S. P., Biodegradable polymer used in biomedical field (I), biodegradable polymers. *Journal of Wuhan University of Technology*, 1999, 21(2): 1-4.
16. **Fu J.**, Li S. P., Biodegradable polymer used in biomedical field (II). *Journal of Wuhan University of Technology*, 1999, 21(5): 19-22.
17. **Fu J.**, Zhuo R. X., Fan C. L., Studies on the synthesis and properties of poly (ester-anhydrides) for drug delivery system. *Chemical Journal of Chinese Universities*, 1998, 19(5): 813-816.
18. **Fu J.**, Zhuo R. X., Fan C. L., New type of biodegradable polymer material used in medical-polyanhydrides. *Journal of Functional Polymers*, 1998, 11(2): 302-310.
19. **Fu J.**, Zhuo R. X., Fan C. L., Studies on the synthesis and properties of phosphorus-containing polyanhydrides for DDS. *Chemical Journal of Chinese Universities*, 1997, 18(5): 813-817.
20. **Fu J.**, Zhuo R. X., Fan C. L., Studies on the synthesis and drug release properties of polyanhydrides containing phosphonoformic (or acetic) acid ethyl ester in the main chain. *Chemical Journal of Chinese Universities*, 1997, 18(10): 1706-1710.
21. **Fu J.**, Zhuo R. X., Fan C. L., Studies on the melt copolymerization of phosphorus-containing diacid & bis(p-carboxyphenoxy)-propane for drug delivery system. *Journal of Wuhan University*, 1997, 43(4): 467-470.

22. **Fu J.**, Yang X. L., Wang J., Manufacture and application of stone-reinforced plastics. *Applicable Technology Market*, 1997, 9:20-21.
23. Wang J., **Fu J.**, Rosin used in polymer material, *Polymer Materials*, 1997, 4(1): 42-44.
24. **Fu J.**, Wang J., Meng H. J., Adhesive made from polystyrene waste. *Chemical Materials for Construction*, 1997, 13(7): 20-21.
25. Wang J., Yang S. H., **Fu J.**, Liu R. X., Studies on a new type of initiator system used in UP resin at room temperature. *Journal of Wuhan University of Technology*, 1996, 18(3): 25-27.
26. Wang J., **Fu J.**, Meng H. J., Studies on the conducting composites of carbon black-epoxy resin. *Fiber Reinforced Plastics/Composites*, 1996, (4): 25-27.
27. Wang J., **Fu J.**, Meng H. J., A new type of initiator system used in FRP at room temperature. *Fiber Reinforced Plastics/Composites*, 1996, (5): 11-13.
28. Wang J., **Fu J.**, Meng H. J., Studies on syntheses & properties of reaction type of flame -retardant UP resin. *Fiber Composites*, 1996, 13(3): 11-14.
29. Wang J., Yang S. H., **Fu J.**, Zhu H., Meng H. J., Studies on the synthesis of fluorine containing aniline resin and curing for epoxy resin. *Journal of Wuhan University of Technology*, 1996, 18(3): 11-13.
30. **Fu J.**, Wang J., Liu X. Y., Study of cure mechanism for methyl methacrylate resin composite with transparency at room temperature. *Fiber Reinforced Plastics/Composites*, 1992, (1): 12-14.
31. Qiu K. Y., **Fu J.**, Guo X. Q., Feng X. D., Studies on organic peroxide/N, N-Di (2-2'-methyl-acryloyloxy propyl)-para-toluidine binary systems. *Chinese J. of Polymer Sci.*, 1990, 8(2): 188-195.
32. **Fu J.**, Guo X. Q., Qiu K. Y., Feng X. D., Wu Q. R., Studies on the vinyl polymerization and its mechanism initiated with organic peroxide & N, N- Di(2-hydroxyalkyl)-P-toluidine systems. *Acta Polymeric Sinica*, 1990, 2(1): 67-75.
33. Qiu K. Y., **Fu J.**, Polymerization of Methyl Methacrylate initiated by peroxydicarbonate & N, N-dihydroxyalkyl-P-toluidine systems. *Chemical Journal of Chinese Universities*, 1989, 10(5): 506-510.
34. Qiu K. Y., **Fu J.**, Radical polymerization of N, N-Di(2-2'-methyl-acryloyloxy-propyl) -para-toluidine functional monomer. *Chinese J. of Polymer Sci.*, 1989, 7(3): 258-265.
35. Zhuo R. X., Fan C. L., Lou X., **Fu J.**, Study on UV-curing poly(perfluoro alkoxypropylmethyl-siloxane). *Acta Polymeric Sinica*, 1988, (5): 368-372.

### ***Book Chapter***

1. **Fu J.**, Biomedical polymer materials, In: *Introduction of Biomedical Materials*, Ed. Li S. P., Chapter 4, pp.129-200, Wuhan Univ. of Tech. Press, Wuhan, China, 2000.

### ***Selected Conference Abstracts and Presentation***

1. Sakhalkar H.S., **Fu J.**, Benavides U., Hanes J., Kohn L.D., Kurjiaka D.T., Goetz D.J., Selective adhesion of anti-VCAM-1 biodegradable particles to DSS induced colitic vasculature. Proceedings of the American Institute of Chemical Engineers, Austin, TX, 2004
2. Sakhalkar H.S., **Fu J.**, Benavides U., Hanes J., Kohn L.D., Kurjiaka D.T, Goetz D.J., Enhanced Adhesion of Anti-VCAM-1 Biodegradable Particles to Murine Colitic Vasculature. Biomedical Engineering Society Annual Meeting, Philadelphia, PA, October, 2004.
3. **Fu, J.**, Har-el, Y., Suh, J., and Hanes, J. Biodegradable Poly(aspartic anhydride-co-ethylene glycol) for Gene Delivery, Proceedings of the International Symposium on Controlled Release of Bioactive Materials. Controlled Release Society, Glasgow, Scotland. 30: 586-587, 2003
4. **Fu, J.**, and Hanes J., A New Family of Poly(ether-anhydrides) for Pulmonary Drug Delivery, Proceedings of the International Symposium on Controlled Release of Bioactive Materials. Controlled Release Society, Glasgow, Scotland. 30:728-729, 2003.
5. Hanes J, **Fu J**, Sakhalkar HS, Morita T, Goetz DJ. Targeted Drug Delivery to Sites of Inflammation using New Leukocyte-Mimetic Polymeric Particles, Proceedings of the American Institute of Chemical Engineers, San Francisco, CA, 2003
6. Fiegel J, **Fu J**, Hanes J. Poly(ether-anhydride) Aerosol Particles: Control of Surface Characteristics to Improve Aerodynamics, Proceedings of the American Institute of Chemical Engineers, San Francisco, CA, 2003
7. **Fu, J.**, Har-el, Y., Suh, J., and Hanes, J., Polymeric Gene Vectors with Reduced Cytotoxicity that Efficiently Unpack DNA. Proceedings of the Biomedical Engineering Society Annual Fall Meeting, Nashville, TN, 2003
8. Fiegel, J., **Fu, J.**, and Hanes, J., Controlled release poly(ether-anhydride) large porous particles for pulmonary delivery, 2003, *J. Aero. Med.*, 16: 212
9. **Fu J.**, Krauland E., Harel Y., Hanes J., New degradable cationic polyesters for gene delivery. In: The second joint EMBS( 24<sup>th</sup> Annual International Conference of the Engineering in Medicine and Biology Society) and BMES(Biomedical Engineering Society) Meeting, Houston, TX, Oct. 2002.
10. **Fu J.**, Fiegel J., Hanes J., Synthesis and drug release from PEG-containing poly(ether-anhydride)

Aerosols: new materials for pulmonary drug delivery. In: The Proceedings of the American Institute of Chemical Engineers, Indianapolis, IN, November, 3-8, 2002

11. **Fu J.**, Krauland E., Harel Y., Hanes J., New degradable cationic polymers for gene delivery. In: The Proceedings of the American Institute of Chemical Engineers, Indianapolis, IN, November, 3-8, 2002
12. Fiegel J., **Fu J.**, Hanes J., New poly(ether-anhydride) aerosols: control of particulate physical and chemical properties for improved aerosolization and deposition behavior. In: The Proceedings of the American Institute of Chemical Engineers, Indianapolis, IN, November, 3-8, 2002
13. Hanes J., Fiegel J., **Fu J.**, New polymers for controlled pulmonary drug delivery (Invited Talk). *Annals of Biomedical Eng.*, 2001, 29(Suppl. 1): S138, Durham, NC.
14. **Fu J.**, Fiegel J., Hanes J., Large, light polyether-anhydride microspheres: a new carrier for pulmonary drug delivery. *Proc Intern Symp Controlled Rel Bioact Mater*, 2001, 28: 393-394.
15. Wang J, **Fu J.**, Yang X.L., Study of UP-CU Resin Synthesis and Its Composite Material, *Joint Annual Meeting of Hubei Societies of Fiber Reinforced Plastics/Composite Materials*, Wuhan, China, 1998.
16. Fu J., Wang J., Yang X. L., Study on Tough Epoxy Resin System, *Annual Meeting of Societies of Fiber Reinforced Plastics/Composite Materials*, Beijing, China, 1997.
17. **Fu J.**, Liu X. Y., Studies on the curing mechanism of fiber reinforced plastics with transparency. *Symposium on Composites Materials*, Dalian, China, 1992.
18. **Fu J.**, Coating used for house wall and new mould process of resin, *7<sup>th</sup> Scientific Meeting of Hubei Society of Fiber Reinforced Plastics*, Wuhan, China, 1992.
19. Qiu k. Y., **Fu J.**, The effect of N, N-Di(2-methacryloxypropyl)-P-toluidine on methyl methacrylate radical polymerization. *Symposium on Polymers*, Chengdu, China, 1989.
20. Qiu k. Y., **Fu J.**, The effects of N, N-Di(2-hydroxypropyl)-P-toluidine and its derivative on methyl methacrylate polymerization. *International Symposium on Functional and Fine Polymers*, Xi'an, China, 1988.
21. **Fu J.**, Qiu k. Y., Studies on the mechanism of vinyl polymerization initiated with system of organic peroxide and N,N-Di(2-hydroxyalkyl)-P-toluidine. *Symposium on Polymer Syntheses, Polymerization Reaction & Mechanisms*, Nanjing, China, 1988.

### **Patent**

1. Hanes, J., Fu, J., Functionalized poly(ether-anhydride) block copolymers, biodegradable polymers, composition including microspheres and nanospheres, and their use. PCT Int. Appl. (2006), 37 pp. WO 2006063249

2. Hanes J., Fu, J., Fiegel, J., Biodegradable polymer, compositions, and pharmaceutical uses. PCT Int. Appl. (2003), 95 pp. WO 2003000237