ANTONIOS G. MIKOS

Curriculum Vitae

Web site: http://mikoslab.rice.edu/
E-mail: mikos@rice.edu

Education

Ph.D. (Ch.E.), Purdue University, 1988
M.S.Ch.E., Purdue University, 1985
Dipl.Ch.E., Aristotle University of Thessaloniki, Greece, 1983

Honorary Doctorates

Hon. Prof., Sichuan University, Chengdu, China, 2012
Hon. Prof., Chinese PLA General Hospital, Beijing, China, 2018
Doc. Hon. Causa, University of Crete, Heraklion, Crete, Greece, 2018
Doc. Hon. Causa, Aristotle University of Thessaloniki, Thessaloniki, Greece, 2019

Professional Experience

2024-	Distinguished Visiting Professor, School of Materials Science and Engineering, Tsinghua University, Beijing, China
2017-2023	Director of National Institutes of Health Center for Engineering Complex Tissues, Rice University
2017-	Director of Biomaterials Lab, Rice University
2016-2019	Distinguished Visiting Professor, School of Materials Science and Engineering, Tsinghua University, Beijing, China
2013-	Professor of Chemistry and Materials Science and NanoEngineering, Rice University
1999-	Director of John W. Cox Laboratory for Biomedical Engineering, Rice University
1999-	Director of Center for Excellence in Tissue Engineering, Rice University
1999-	Louis Calder Professor of Bioengineering and Chemical and Biomolecular Engineering, Rice University
1996-1999	Associate Professor of Bioengineering and Chemical Engineering, Rice University
1992-1996	Assistant Professor of Chemical Engineering and Bioengineering, Rice University

Academies

National Academy of Engineering, 2012
National Academy of Medicine, 2012
Texas Academy of Medicine, Engineering, Science and Technology, 2012
National Academy of Inventors, 2014
Academy of Athens, 2016
International Academy of Medical and Biological Engineering, 2017
Academia Europaea, 2020
Chinese Academy of Engineering, 2021
Royal Academy of Pharmacy of Galicia, 2024
American Academy of Arts and Sciences, 2024
European Academy of Sciences, 2025

Fellowships

American Institute for Medical and Biological Engineering, 1999
International Union of Societies for Biomaterials Science and Engineering, 2000
Biomedical Engineering Society, 2009
Controlled Release Society, 2011
American Association for the Advancement of Science, 2012
Tissue Engineering and Regenerative Medicine International Society, 2012
American Institute of Chemical Engineers, 2014

Awards

2025 Global Biomaterials Leadership Award, Chinese Association for Biomaterials
2024 Biomaterials Global Impact Award
2024 Faculty Award for Excellence in Research, Teaching, and Service, Rice University
2023 Cato T. Laurencin Regenerative Engineering Founder's Award, American Institute of Chemical Engineers
2023 International Award, European Society for Biomaterials
2023 Jensen Tissue Engineering Award, Tissue Engineering and Regenerative Medicine International Society-Global
2023, 20, 12, 05, 02, 98, 97 Research Advisor of Graduate Student Award for Outstanding Research, Society For Biomaterials
2022 Presidential Mentoring Award, Rice University
2020 Founders Award, Controlled Release Society
2019 Acta Biomaterialia Gold Medal
2019 Research Advisor of Outstanding Research by Hospital Intern Award, Society For Biomaterials
2017 James E. Bailey Award in Biological Engineering, American Institute of Chemical Engineers
2017 Shu Chien Achievement Award, Biomedical Engineering Society
2016 Excellence in Surface Science Award, Surfaces in Biomaterials Foundation
2015 Lifetime Achievement Award, Tissue Engineering and Regenerative Medicine International Society-Americas
2014 Distinguished Engineering Alumnus Award, Purdue University
2014 Research Advisor of Undergraduate Student Award for Outstanding Research, Society For Biomaterials
2011 Founders Award, Society For Biomaterials
2010 Food, Pharmaceutical and Bioengineering Award in Chemical Engineering, American Institute of Chemical Engineers
2010 Distinguished Scientist Award - Isaac Schour Memorial Award, International Association for Dental Research
2010 Meriam/Wiley Distinguished Author Award, American Society for Engineering Education
2009 Chemstations Lectureship Award, American Society for Engineering Education
2007 Alpha Chi Sigma Award for Chemical Engineering Research, American Institute of Chemical Engineers
2007 Robert A. Pritzker Distinguished Lecturer Award, Biomedical Engineering Society
2007 Edith and Peter O'Donnell Award in Engineering, Texas Academy of Medicine, Engineering, Science and Technology
2005 Marshall R. Urist Award for Excellence in Tissue Regeneration Research, Orthopaedic Research Society
2003 Huygens Lecturer Award, Netherlands Organization for Scientific Research
2001 Clemson Award for Contributions to the Literature, Society For Biomaterials
1996 FIRST Award, National Institutes of Health

Other Experience and Professional Memberships

1995-	Editor-in-Chief, Tissue Engineering Part A: Research Advances
2008-	Editor-in-Chief, Tissue Engineering Part B: Reviews
2008-	Editor-in-Chief, Tissue Engineering Part C: Methods
2009-2011	President, Tissue Engineering and Regenerative Medicine International Society-Americas
2013-2014	President, Society For Biomaterials

Books (Selected from over 17 books)

1. C.W. Patrick, Jr., A.G. Mikos, and L.V. McIntire, "Frontiers in Tissue Engineering," Elsevier Science, New York, 1998.
2. F. Bronner, M.C. Farach-Carson, and A.G. Mikos, "Engineering of Functional Skeletal Tissues," Topics in Bone Biology, Vol. 3, Springer-Verlag, London, 2007.
3. J.P. Fisher, A.G. Mikos, and J.D. Bronzino, "Tissue Engineering," CRC Press, Boca Raton, 2007.
4. J.J. Mao, G. Vunjak-Novakovic, A.G. Mikos, and A. Atala, "Translational Approaches in Tissue Engineering and Regenerative Medicine," Artech House, Norwood, 2008.
5. J.S. Temenoff and A.G. Mikos, "Biomaterials: The Intersection of Biology and Materials Science," Pearson Prentice Hall, Upper Saddle River, 2008.
6. P.C. Johnson and A.G. Mikos, "Angiogenesis," Advances in Tissue Engineering, Vol. 1, Mary Ann Liebert, New Rochelle, 2010.
7. P.C. Johnson and A.G. Mikos, "Stem Cells," Advances in Tissue Engineering, Vol. 2, Mary Ann Liebert, New Rochelle, 2010.
8. J.P. Fisher, A.G. Mikos, J.D. Bronzino, and D.R. Peterson, "Tissue Engineering Principles and Practices," CRC Press, Boca Raton, 2013.
9. A. Atala, R. Lanza, A.G. Mikos, and R. Nerem, "Principles of Regenerative Medicine," 3rd Ed., Elsevier Academic Press, San Diego, 2019.
10. J.S. Temenoff and A.G. Mikos, "Biomaterials: The Intersection of Biology and Materials Science," 2nd Ed., Pearson, Hoboken, 2023.

Publications (Selected from over 710 publications)

1. G.M. Crane, S.L. Ishaug, and A.G. Mikos, "Bone Tissue Engineering," *Nature Medicine, 1,* 1322-1324 (1995).
2. W.T. Godbey, K.K. Wu, and A.G. Mikos, "Tracking the Intracellular Path of Poly(Ethylenimine)/DNA Complexes for Gene Delivery," *Proceed. Natl. Acad. Sci. USA, 96,* 5177-5181 (1999).
3. G.N. Bancroft, V.I. Sikavitsas, J. van den Dolder, T.L. Sheffield, C.G. Ambrose, J.A. Jansen, and A.G. Mikos, "Fluid Flow Increases Mineralized Matrix Deposition in 3D Perfusion Culture of Marrow Stromal Osteoblasts in a Dose-Dependent Manner," *Proceed. Natl. Acad. Sci. USA, 99,* 12600-12605 (2002).
4. V.I. Sikavitsas, G.N. Bancroft, H.L. Holtorf, J.A. Jansen, and A.G. Mikos, "Mineralized Matrix Deposition by Marrow Stromal Osteoblasts in 3D Perfusion Culture Increases with Increasing Fluid Shear Forces," *Proceed. Natl. Acad. Sci. USA, 100,* 14683-14688 (2003).
5. N. Datta, Q.P. Pham, U. Sharma, V.I. Sikavitsas, J.A. Jansen, and A.G. Mikos, "*In Vitro* Generated Extracellular Matrix and Fluid Shear Stress Synergistically Enhance 3D Osteoblastic Differentiation," *Proceed. Natl. Acad. Sci. USA, 103,* 2488-2493 (2006).
6. S. Kaihara, S. Matsumura, A.G. Mikos, and J.P. Fisher, "Synthesis of Poly(L-Lactide) and Polyglycolide by Ring-Opening Polymerization," *Nature Protocols, 2,* 2767-2771 (2007).
7. F.K. Kasper, K. Tanahashi, J.P. Fisher, and A.G. Mikos, "Synthesis of Poly(Propylene Fumarate)," *Nature Protocols, 4,* 518-525 (2009).
8. L.A. Kinard, F.K. Kasper, and A.G. Mikos, "Synthesis of Oligo(Poly(Ethylene Glycol) Fumarate)," *Nature Protocols, 7,* 1219-1227 (2012).
9. P.P. Spicer, J.D. Kretlow, S. Young, J.A. Jansen, F.K. Kasper, and A.G. Mikos, "Evaluation of Bone Regeneration Using the Rat Critical Size Calvarial Defect," *Nature Protocols, 7,* 1918-1929 (2012).
10. E.L.S. Fong, S.-E. Lamhamedi-Cherradi, E. Burdett, V. Ramamoorthy, A.J. Lazar, F.K. Kasper, M.C. Farach-Carson, D. Vishwamitra, E.G. Demicco, B.A. Menegaz, H.M. Amin, A.G. Mikos, and J.A.

Ludwig, “Modeling Ewing Sarcoma Tumors *In Vitro* with 3D Scaffolds,” *Proceed. Natl. Acad. Sci. USA, 110,* 6500-6505 (2013).
11. M. Santoro, S.-E. Lamhamedi-Cherradi, B.A. Menegaz, J.A. Ludwig, and A.G. Mikos, “Flow Perfusion Effects on Three-Dimensional Culture and Drug Sensitivity of Ewing Sarcoma,” *Proceed. Natl. Acad. Sci. USA, 112,* 10304-10309 (2015).
12. S.R. Shah, S. Young, J.L. Goldman, J.A. Jansen, M.E. Wong, and A.G. Mikos, “A Composite Critical-Size Rabbit Mandibular Defect for Evaluation of Craniofacial Tissue Regeneration,” *Nature Protocols, 11,* 1989-2009 (2016).
13. M. Şentürk, G. Lin, Z. Zuo, D. Mao, E. Watson, A.G. Mikos, and H.J. Bellen, “Ubiquilins Regulate Autophagic Flux through mTOR Signalling and Lysosomal Acidification,” *Nature Cell Biol., 21,* 384-396 (2019).
14. A.M. Tatara, G.L. Koons, E. Watson, T.C. Piepergerdes, S.R. Shah, B.T. Smith, J. Shum, J.C. Melville, I.A. Hanna, N. Demian, T. Ho, A. Ratcliffe, J.J.J.P. van den Beucken, J.A. Jansen, M.E. Wong, and A.G. Mikos, “Biomaterials-Aided Mandibular Reconstruction Using *In Vivo* Bioreactors,” *Proceed. Natl. Acad. Sci. USA, 116,* 6954-6963 (2019).
15. J.L. Guo, Y.S. Kim, V.Y. Xie, B.T. Smith, E. Watson, J. Lam, H.A. Pearce, P.S. Engel, and A.G. Mikos, “Modular, Tissue-Specific, and Biodegradable Hydrogel Cross-Linkers for Tissue Engineering,” *Science Adv., 5,* eaaw7396 (11pp) (2019).
16. G.L. Koons, M. Diba, and A.G. Mikos, “Materials Design for Bone-Tissue Engineering,” *Nature Rev. Mater., 5,* 584-603 (2020).
17. M.M. Smoak, K.J. Hogan, K.J. Grande-Allen, and A.G. Mikos, “Bioinspired Electrospun dECM Scaffolds Guide Cell Growth and Control the Formation of Myotubes,” *Science Adv., 7,* eabg4123 (12pp) (2021).
18. M. Diba, G.L. Koons, M.L. Bedell, and A.G. Mikos, “3D Printed Colloidal Biomaterials Based on Photo-Reactive Gelatin Nanoparticles,” *Biomaterials, 274,* 120871 (16pp) (2021).
19. T. Bello, C. Paindelli, L.A. Diaz-Gomez, A. Melchiorri, A.G. Mikos, P.S. Nelson, E. Dondossola, and T.S. Gujral, “Computational Modeling Identifies Multitargeted Kinase Inhibitors as Effective Therapies for Metastatic, Castration-Resistant Prostate Cancer,” *Proceed. Natl. Acad. Sci. USA, 118,* e2103623118 (11pp) (2021).
20. J. Zhu, S. Yang, Y. Qi, Z. Gong, H. Zhang, K. Liang, P. Shen, Y.-Y. Huang, Z. Zhang, W. Ye, L. Yue, S. Fan, S. Shen, A.G. Mikos, X. Wang, and X. Fang, “Stem Cell-Homing Hydrogel-Based miR-29b-5p Delivery Promotes Cartilage Regeneration by Suppressing Senescence in an Osteoarthritis Rat Model,” *Science Adv., 8,* eabk0011 (16pp) (2022).
21. B. Yuan, Y. Zhang, R. Zhao, H. Lin, X. Yang, X. Zhu, K. Zhang, A.G. Mikos, and X. Zhang, “A Unique Biomimetic Modification Endows Polyetherketoneketone Scaffold with Osteoinductivity by Activating cAMP/PKA Signaling Pathway,” *Science Adv., 8,* eabq7116 (12pp) (2022).
22. M. Parlani, M.L. Bedell, A.G. Mikos, P. Friedl, and E. Dondossola, “Dissecting the Recruitment and Self-Organization of αSMA-Positive Fibroblasts in the Foreign Body Response,” *Science Adv., 8,* eadd0014 (14pp) (2022).
23. R. Wang, M. Wang, R. Jin, Y. Wang, M. Yi, Q. Li, J. Li, K. Zhang, C. Sun, Y. Nie, C. Huang, A.G. Mikos, and X. Zhang, “High Strength Titanium with Fibrous Grain for Advanced Bone Regeneration,” *Adv. Science, 10,* 2207698 (11pp) (2023).
24. S.M. Stanford, T.P. Nguyen, J. Chang, Z. Zhao, G.L. Hackman, E. Santelli, C.M. Sanders, M. Katiki, E. Dondossola, B.L. Brauer, M.A. Diaz, Y. Zhan, S.H. Ramsey, P.A. Watson, B. Sankaran, C. Paindelli, V. Parietti, A.G. Mikos, A. Lodi, A. Bagrodia, A. Elliott, R.R. McKay, R. Murali, S. Tiziani, A.N. Kettenbach, and N. Bottini, “Targeting Prostate Tumor Low-Molecular Weight Tyrosine Phosphatase for Oxidation-Sensitizing Therapy,” *Science Adv., 10,* eadg7887 (19pp) (2024).
25. J.C. Chen, G. Bhave, F. Alrashdan, A. Dhuliyawalla, K.J. Hogan, A.G. Mikos, and J.T. Robinson, “Self-Rectifying Magnetoelectric Metamaterials for Remote Neural Stimulation and Motor Function Restoration,” *Nature Mater., 23,* 139-146 (2024).

Patents (Selected from over 33 patents)

1. A.G. Mikos and R. Langer, “Preparation of Bonded Fiber Structures for Cell Implantation,” U.S. Patent No. 5,512,600 (April 30, 1996).

2. A.G. Mikos, G. Sarakinos, J.P. Vacanti, R.S. Langer, and L.G. Cima, “Polymer Membranes and Methods of Preparation of Three Dimensional Membrane Structures,” U.S. Patent No. 5,514,378 (May 7, 1996).
3. A.G. Mikos, “Bone Regeneration Templates,” U.S. Patent No. 5,522,895 (June 4, 1996).
4. L.J. Suggs, R.G. Payne, M.J. Yaszemski, and A.G. Mikos, “Poly(Propylene Fumarate-co-Ethylene Oxide),” U.S. Patent No. 5,527,864 (June 18, 1996).
5. L.J. Suggs, R.G. Payne, M.J. Yaszemski, and A.G. Mikos, “Method of Making Poly(Propylene Fumarate-co-Ethylene Oxide),” U.S. Patent No. 5,644,005 (July 1, 1997).
6. A.G. Mikos and R. Langer, “Preparation of Bonded Fiber Structures for Cell Implantation,” U.S. Patent No. 5,696,175 (December 9, 1997).
7. M.J. Yaszemski, R.G. Payne, and A.G. Mikos, “Poly(Propylene Fumarate),” U.S. Patent No. 5,733,951 (March 31, 1998).
8. S.J. Peter, M.J. Yaszemski, and A.G. Mikos, “Bone Replacement Compound Comprising Poly(Propylene Fumarate),” U.S. Patent No. 6,124,373 (September 26, 2000).
9. A.G. Mikos and S. Jo, “Functionalized Poly(Propylene Fumarate) and Poly(Propylene Fumarate-co-Ethylene Glycol),” U.S. Patent No. 6,306,821 (October 23, 2001).
10. S.J. Peter, L.J. Suggs, P.S. Engel, and A.G. Mikos, “Synthesis of Poly(Propylene Fumarate) by Acylation of Propylene Glycol in the Presence of a Proton Scavenger,” U.S. Patent No. 6,355,755 (March 12, 2002).
11. S. He, M.J. Yaszemski, and A.G. Mikos, “Poly(Propylene Fumarate) Crosslinked with Poly(Ethylene Glycol),” U.S. Patent No. 6,384,105 (May 7, 2002).
12. S. He, M.J. Yaszemski, and A.G. Mikos, “Biodegradable Poly(Propylene Fumarate) Networks Crosslinked with Poly(Propylene Fumarate)-Diacrylate Macromers,” U.S. Patent No. 6,423,790 (July 23, 2002).
13. A.G. Mikos, R.S. Langer, J.P. Vacanti, L.G. Griffith, and G. Sarakinos, “Porous Biodegradable Polymeric Materials for Cell Transplantation,” U.S. Patent No. 6,689,608 (February 10, 2004).
14. S. He, M.J. Yaszemski, and A.G. Mikos, “Biodegradable Poly(Propylene Fumarate) Networks Crosslinked with Poly(Propylene Fumarate)-Diacrylate Macromers,” U.S. Patent No. 6,759,485 (July 6, 2004).
15. S. Jo and A.G. Mikos, “Biocompatible Macromers,” U.S. Patent No. 6,884,778 (April 26, 2005).
16. A.G. Mikos, J.P. Vacanti, R.S. Langer, L.G. Griffith, and G. Sarakinos, “Porous Biodegradable Polymeric Materials for Cell Transplantation,” U.S. Patent No. 7,462,471 (December 9, 2008).
17. A.G. Mikos and K. Tanahashi, “Synthesis and Characterization of Biodegradable Cationic Poly(Propylene Fumarate-co-Ethylene Glycol) Copolymer Hydrogels Modified with Agmatine for Enhanced Cell Adhesion,” U.S. Patent No. 7,629,388 (December 8, 2009).
18. A.G. Mikos, R.S. Langer, J.P. Vacanti, L.G. Griffith, and G. Sarakinos, “Method of Forming a Tissue Structure by Introducing Cells into an Implanted Matrix,” U.S. Patent No. 8,110,213 (February 7, 2012).
19. A.G. Mikos and M.C. Hacker, “Macromonomers and Hydrogels,” U.S. Patent No. 8,349,982 (January 8, 2013).
20. C.G. Ambrose, T.A. Clyburn, and A.G. Mikos, “Antibiotic Microspheres for Treatment and Prevention of Osteomyelitis and Enhancement of Bone Regrowth,” U.S. Patent No. 8,986,737 (March 24, 2015).
21. A.G. Mikos, F.K. Kasper, A.K. Ekenseair, T.N. Vo, K.W.M. Boere, and T.J. Touchet, “Injectable Hydrogels,” U.S. Patent No. 9,283,299 (March 15, 2016).
22. A.G. Mikos, M.E. Wong, S.W. Young, J.D. Kretlow, M. Shi, F.K. Kasper, and P.P. Spicer, “Combined Space Maintenance and Bone Regeneration System for the Reconstruction of Large Osseous Defects,” U.S. Patent No. 9,532,875 (January 3, 2017).
23. H.D. Dean, A. Siblani, E.J. Mott, J.P. Fisher, M.O. Wang, and A.G. Mikos, “Absorbant and Reflecting Biocompatible Dyes for Highly Accurate Medical Implants,” U.S. Patent No. 10,183,477 (January 22, 2019).
24. A.M. Tatara, E. Watson, A.G. Mikos, and D.P. Kontoyiannis, “Poly(Diol Fumarates) and Poly(Diol Fumarate-co-Succinates),” U.S. Patent No. 10,835,614 (November 17, 2020).
25. H.D. Dean, A. Siblani, E.J. Mott, J.P. Fisher, M.O. Wang, and A.G. Mikos, “Continuous Digital Light Processing Additive Manufacturing of Implants,” U.S. Patent No. 11,865,785 (January 9, 2024).