

Stanford



Yunzhi Peter Yang

Professor of Orthopaedic Surgery and, by courtesy, of Materials Science and Engineering and of Bioengineering

Bio

ACADEMIC APPOINTMENTS

- Professor, Orthopaedic Surgery
- Professor (By courtesy), Materials Science and Engineering
- Professor (By courtesy), Bioengineering
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Editorial Board, The International Journal of Oral & Maxillofacial Implants, (2007-2012)
- Voting member, U.S. Technical Advisory Group for ISO/TC 106 Dentistry, (2008- present)
- Director-at-Large, International Association For Dental Research (IADR) Implantology Research Group, (2010-2014)
- Editorial Board, Journal of Cancer Science & Therapy, (2010-2014)
- Editorial Board, Journal of Thermodynamics & Catalysis, (2010-2014)
- Session Editor of Biomaterials topic, Journal of Orthopedic Translation, (2013- present)
- Editorial Board, Genes and Diseases, (2014- present)
- Editorial Board, Tissue Engineering (A, B, C), (2015-2018)
- Associate Editor, Odontology, (2020- present)

HONORS AND AWARDS

- Research Award, Memphis Bioworks Foundation (2005-2006)
- Research Award, March of Dimes Foundation (2006-2010)
- Early Career Translational Research Award Phase I, Wallace H Coulter Foundation (2007-2009)
- Research Award, Implant Dentistry Research and Education Foundation (2007-2009)
- Aircast Award for Basic Science, AMERICAN ORTHOPAEDIC SOCIETY FOR SPORTS MEDICINE (2008)
- Research Award, UTRF Technology Maturation Fund Program (2008-2009)
- Young Investigator Award, the University of Texas Health Science Center at Houston (2009)

- Early Career Translational Research Award Phase II, Wallace H Coulter Foundation (2009-2012)
- Congressional Briefing on translational research breakthroughs at Capitol Hill, the American Institute of Medical and Biological Engineering (2010)
- Research Award, Airlift Research Foundation (2010-2012)
- Research Award, National Institutes of Health (2010-2014)
- Research Award, Department of Defense (2010-2014)
- Dean's Teaching Excellence Award in Scholarship of Engagement and Collaboration", the University of Texas Health Science Center at Houston (2011)
- Research Award, Boswell Foundation (2011)
- Wallace H. Coulter Fellow, Wallace H. Coulter Foundation (2011)
- Research Award, NanoHealth Alliance (2011-2013)
- Research Award, National Institutes of Health (2011-2015)
- Research Diversity Supplement Award, National Institutes of Health (2012-2014)
- Research Diversity Supplement Award, National Institutes of Health (2012-2015)
- 2014 Defense University Research Instrumentation Program Award, Army Research Office (2014)
- Coulter Translational Research Seed Grant, Stanford Coulter Program (2014)
- Research Award, Foundation of Orthopedic Trauma (2014)
- Spark Seed Grant Award, Stanford Spark Program (2014)
- Research Award, National Institutes of Health (2014-2020)
- Coulter Translational Research Seed Grant, Stanford Coulter Program (2015)
- NIH Transformative Research Award Finalist, National Institutes of Health (2015)
- Star Research Award, National Institute of Health (2015-2020)
- Coulter Translational Research Seed Grant, Stanford Coulter Program (2016)
- Research Award for Clean Energy, The Precourt Institute for Energy and the TomKat Center for Sustainable Energy (2016)
- The 2016 Annals of Biomedical Engineering Award, the Annals of Biomedical Engineering (2016)
- Research Award, National Institutes of Health (NIAMS/NIBIB) (2016-2022)
- Monetary Gift for Research, Kent Thiry and Denise O'Leary (2017)
- Research Award, Stanford Spectrum MedTech Program (2017)
- 2018 TechConnect Innovation Awardee for Hybprinter, TechConnect World Conference (2018)
- Research Award, Orthopaedic Research and Education Foundation (2018-2019)
- Research Award, National Institutes of Health (2018-2023)
- Research Award, AOTrauma North America (2019-2020)
- Research Award, National Institutes of Health (2019-2024)
- AIMBE Fellow, American Institute for Medical and Biological Engineering (AIMBE) (2020)
- Research Award, the Stanford Woods Institute for the Environment's Environmental Venture Projects program (2020-2022)
- Research Award, Department of Defense (2020-2023)
- Research Award, Department of Defense (2022-2026)
- High Impact Technology Award, Stanford University (2023)
- Research Award, National Institutes of Health (2023-2027)

PROFESSIONAL EDUCATION

- Postdoctoral Fellow, University of Texas Health Science Center at San Antonio, San Antonio, TX , Biomaterials (2003)

- Postdoctoral Fellow, West China University of Medical Sciences, Chengdu, China , Biomaterials (1999)
- Ph.D., Sichuan University, Chengdu, China , Biomedical Engineering (1997)
- M.E., Sichuan University, Chengdu, China , Inorganic Materials (1995)
- B.S., Sichuan University, Chengdu, China , Inorganic Materials (1992)

LINKS

- Peter Yang Lab Site: <http://yanglab.stanford.edu/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our research interests are in the areas of biomaterials, implant devices, drug delivery, 3D printing, and musculoskeletal tissue engineering. In particular, we are interested in developing bio-inspired biomaterials and platform technologies to engineer tissues and organs. We aim to improve understanding of tissue-like chemistry and structure of medical device design using advanced 3D printing, how these lead to tissue-like properties and functions, and the extent to which they can enhance clinical outcomes. Our research methodology includes concept design and development of medical devices as well as advanced 3D printing, characterization and evaluation in vitro, and in vivo validation of novel biomaterials and implant devices. Our current program comprises the following themes: Enabling technology for musculoskeletal tissue engineering and bioprinting, surface nanotechnology for osseointegrated implant devices, and naturally derived novel biomaterials for cancer treatment.

Teaching

COURSES

2023-24

- Introduction to Bioengineering Research: BIOE 390, MED 289 (Aut)
- Orthopaedic Tissue Engineering: ORTHO 270 (Win)

2022-23

- Introduction to Bioengineering Research: BIOE 390, MED 289 (Aut)
- Orthopaedic Tissue Engineering: ORTHO 270 (Win)

2021-22

- Introduction to Bioengineering Research: BIOE 390, MED 289 (Aut)
- Orthopaedic Tissue Engineering: ORTHO 270 (Win)

2020-21

- Introduction to Bioengineering Research: BIOE 390, MED 289 (Aut)
- Orthopaedic Tissue Engineering: ORTHO 270 (Win)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Jiannan Li, Elaine Lui, Tomohiro Uno, Hossein Vahid Alizadeh, Peng Zhao

Doctoral Dissertation Advisor (AC)

Andrea Flores Perez, Carolyn Kim

Doctoral (Program)

Mihyun Choi

Postdoctoral Research Mentor

Jiannan Li

Publications

PUBLICATIONS

- **Optimizing Tissue Engineering for Clinical Relevance in Rotator Cuff Repair.** *Tissue engineering. Part B, Reviews*
Durtschi, M., Kim, S., Li, J., Kim, C., Chu, C., Cheung, E., Safran, M., Abrams, G., Yang, Y. P.
2024
- **Preclinical models for studying corticosteroid-induced osteonecrosis of the femoral head.** *Journal of biomedical materials research. Part B, Applied biomaterials*
Tsubosaka, M., Maruyama, M., Lui, E., Kushioka, J., Toya, M., Gao, Q., Shen, H., Li, X., Chow, S. K., Zhang, N., Yang, Y. P., Goodman, S. B.
2024; 112 (1): e35360
- **An osteoinductive and biodegradable intramedullary implant accelerates bone healing and mitigates complications of bone transport in male rats.** *Nature communications*
Lin, S., Maekawa, H., Moeinzadeh, S., Lui, E., Alizadeh, H. V., Li, J., Kim, S., Poland, M., Gadomski, B. C., Easley, J. T., Young, J., Gardner, M., Mohler, et al
2023; 14 (1): 4455
- **Metabolic profile of mesenchymal stromal cells and macrophages in the presence of polyethylene particles in a 3D model.** *Stem cell research & therapy*
Teissier, V., Gao, Q., Shen, H., Li, J., Li, X., Huang, E. E., Kushioka, J., Toya, M., Tsubosaka, M., Hirata, H., Alizadeh, H. V., Maduka, C. V., Contag, et al
2023; 14 (1): 99
- **Development and characterization of an automated active mixing platform for hydrogel bioink preparation.** *International journal of bioprinting*
Li, J., Shelby, T., Alizadeh, H. V., Shelby, H., Yang, Y. P.
2023; 9 (4): 705
- **The efficiency of genetically modified mesenchymal stromal cells combined with a functionally graded scaffold for bone regeneration in corticosteroid-induced osteonecrosis of the femoral head in rabbits.** *Journal of biomedical materials research. Part A*
Tsubosaka, M., Maruyama, M., Lui, E., Moeinzadeh, S., Huang, E. E., Kushioka, J., Hirata, H., Jain, C., Storaci, H. W., Chan, C., Toya, M., Gao, Q., Teissier, et al
2023
- **A bioactive compliant vascular graft modulates macrophage polarization and maintains patency with robust vascular remodeling.** *Bioactive materials*
Stahl, A., Hao, D., Barrera, J., Henn, D., Lin, S., Moeinzadeh, S., Kim, S., Maloney, W., Gurtner, G., Wang, A., Yang, Y. P.
2023; 19: 167-178
- **Development and characterization of an automated active mixing platform for hydrogel bioink preparation** *INTERNATIONAL JOURNAL OF BIOPRINTING*
Li, J., Shelby, T., Alizadeh, H., Shelby, H., Yang, Y.
2023; 9 (3)
- **Development and systematic characterization of GelMA/alginate/PEGDMA/xanthan gum hydrogel bioink system for extrusion bioprinting.** *Biomaterials*
Li, J., Moeinzadeh, S., Kim, C., Pan, C. C., Weale, G., Kim, S., Abrams, G., James, A. W., Choo, H., Chan, C., Yang, Y. P.
2022; 293: 121969
- **Growth and Differentiation Factor-7 Immobilized, Mechanically Strong Quadrol-Hexamethylene Diisocyanate-Methacrylic Anhydride Polyurethane Polymer for Tendon Repair and Regeneration.** *Acta biomaterialia*
Wang, D., Zhang, X., Ng, K. W., Rao, Y., Wang, C., Gharaibeh, B., Lin, S., Abrams, G., Safran, M., Cheung, E., Campbell, P., Weiss, L., Ker, et al
2022
- **TrkB+ Neurons Induce Pathologic Regeneration After Soft Tissue Trauma.** *Stem cells translational medicine*
Cherief, M., Negri, S., Qin, Q., Pagani, C. A., Lee, S., Yang, Y. P., Clemens, T. L., Levi, B., James, A. W.
2022
- **Hybprinting for musculoskeletal tissue engineering.** *iScience*
Li, J., Kim, C., Pan, C., Babian, A., Lui, E., Young, J. L., Moeinzadeh, S., Kim, S., Yang, Y. P.
2022; 25 (5): 104229

● **EFFICACY OF PRECONDITIONED OR GENETICALLY MODIFIED IL4-SECRETING MESENCHYMAL STROMAL CELLS IN A MODEL OF STEROID-ASSOCIATED OSTEONECROSIS OF THE FEMORAL HEAD IN RABBITS**

Goodman, S., Maruyama, M., Moeinzadeh, S., Guzman, R., Takagi, M., Yang, Y.

MARY ANN LIEBERT, INC.2022: S30

● **Dual delivery of BMP-2 and IGF-1 through injectable hydrogel promotes cranial bone defect healing.** *Tissue engineering. Part A*

Park, Y., Lin, S., Bai, Y., Moeinzadeh, S., Kim, S., Huang, J., Lee, U., Huang, N. F., Yang, Y. P.

2022

● **A bioactive synthetic membrane improves bone healing in a preclinical nonunion model.** *Injury*

DeBaun, M. R., Salazar, B. P., Bai, Y., Gardner, M. J., Yang, Y. P., Stanford iTEAM group, Pan, C., Stahl, A. M., Moeinzadeh, S., Kim, S., Lui, E., Kim, C., Lin, S., et al

1800

● **Effect on Osteogenic Differentiation of Genetically Modified IL4 or PDGF-BB Over-Expressing and IL4-PDGF-BB Co-Over-Expressing Bone Marrow-Derived Mesenchymal Stromal Cells In Vitro.** *Bioengineering (Basel, Switzerland)*

Tsubosaka, M., Maruyama, M., Huang, E. E., Zhang, N., Utsunomiya, T., Gao, Q., Shen, H., Li, X., Kushioka, J., Hirata, H., Yao, Z., Yang, Y. P., Goodman, et al 2021; 8 (11)

● **Applying Deep Learning to Quantify Empty Lacunae in Histologic Sections of Osteonecrosis of the Femoral Head.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*

Lui, E., Maruyama, M., Guzman, R. A., Moeinzadeh, S., Pan, C., Pius, A. K., Quig, M. S., Wong, L. E., Goodman, S. B., Yang, Y. P.

2021

● **The effect of genetically modified platelet-derived growth factor-BB over-expressing mesenchymal stromal cells during core decompression for steroid-associated osteonecrosis of the femoral head in rabbits.** *Stem cell research & therapy*

Guzman, R. A., Maruyama, M., Moeinzadeh, S., Lui, E., Zhang, N., Storaci, H. W., Tam, K., Huang, E. E., Utsunomiya, T., Rhee, C., Gao, Q., Yao, Z., Yang, et al 2021; 12 (1): 503

● **The role of MicroRNAs in tendon injury, repair, and related tissue engineering.** *Biomaterials*

Liu, Q., Zhu, Y., Zhu, W., Zhang, G., Yang, Y. P., Zhao, C.

2021; 277: 121083

● **Effect of Zinc Oxide Nanoparticle Addition to Polycaprolactone Periodontal Membranes on Antibacterial Activity and Cell Viability.** *Journal of nanoscience and nanotechnology*

Seo, N., Park, C., Stahl, A. M., Cho, H., Park, S., Yim, S., Yun, K., Ji, M., Kim, H., Yang, Y. P., Lim, H.

2021; 21 (7): 3683–88

● **The efficacy of lapine preconditioned or genetically modified IL4 over-expressing bone marrow-derived mesenchymal stromal cells in corticosteroid-associated osteonecrosis of the femoral head in rabbits.** *Biomaterials*

Maruyama, M., Moeinzadeh, S., Guzman, R. A., Zhang, N., Storaci, H. W., Utsunomiya, T., Lui, E., Huang, E. E., Rhee, C., Gao, Q., Yao, Z., Takagi, M., Yang, et al

2021; 275: 120972

● **Three-Dimensional Zirconia-Based Scaffolds for Load-Bearing Bone-Regeneration Applications: Prospects and Challenges MATERIALS**

Sakthiabirami, K., Soundharajan, V., Kang, J., Yang, Y., Park, S.

2021; 14 (12)

● **Effect of porosity of a functionally-graded scaffold for the treatment of corticosteroid-associated osteonecrosis of the femoral head in rabbits.** *Journal of orthopaedic translation*

Maruyama, M., Pan, C., Moeinzadeh, S., Storaci, H. W., Guzman, R. A., Lui, E., Ueno, M., Utsunomiya, T., Zhang, N., Rhee, C., Yao, Z., Takagi, M., Goodman, et al

2021; 28: 90–99

● **Combining a vascular bundle and 3D printed scaffold with BMP-2 improves bone repair and angiogenesis.** *Tissue engineering. Part A*

Kawai, T., Pan, C., Okuzu, Y., Shimizu, T., Stahl, A., Matsuda, S., Maloney, W., Yang, Y. P.

2021

● **High-resolution radioluminescence microscopy of FDG uptake in an engineered 3D tumor-stoma model.** *European journal of nuclear medicine and molecular imaging*

Khan, S., Kim, S., Yang, Y. P., Pratx, G.

2021

- **Investigation of a Prevascularized Bone Graft for Large Defects in the Ovine Tibia.** *Tissue engineering. Part A*
Yang, Y. P., Gadomski, B., Bruyas, A., Easley, J. T., Labus, K., Brad, N., Palmer, R., Stewart, H., McGilvray, K., Puttlitz, C., Regan, D., Stahl, A., Lui, et al 2021
- **Hybrid porous zirconia scaffolds fabricated using additive manufacturing for bone tissue engineering applications.** *Materials science & engineering. C, Materials for biological applications*
Sakthiabirami, K., Kang, J., Jang, J., Soundharajan, V., Lim, H., Yun, K., Park, C., Lee, B., Yang, Y. P., Park, S.
2021; 123: 111950
- **Osteoinductive 3D printed scaffold healed 5cm segmental bone defects in the ovine metatarsus.** *Scientific reports*
Yang, Y. P., Labus, K. M., Gadomski, B. C., Bruyas, A., Easley, J., Nelson, B., Palmer, R. H., McGilvray, K., Regan, D., Puttlitz, C. M., Stahl, A., Lui, E., Li, et al 2021; 11 (1): 6704
- **Combinatorial mechanical gradation and growth factor biopatterning strategy for spatially controlled bone-tendon-like cell differentiation and tissue formation** *NPG ASIA MATERIALS*
Wang, D., Ker, D., Ng, K., Li, K., Gharaibeh, B., Safran, M., Cheung, E., Campbell, P., Weiss, L., Yang, Y.
2021; 13 (1)
- **In-situ stable injectable collagen-based hydrogels for cell and growth factor delivery.** *Materialia*
Moeinzadeh, S., Park, Y., Lin, S., Yang, Y. P.
2021; 15
- **Management of Morbidity and Mortality in a New Zealand White Rabbit Model of Steroid-Induced Osteonecrosis of the Femoral Head** *COMPARATIVE MEDICINE*
Casey, K. M., Gore, F., Vilches-Moure, J. G., Maruyama, M., Goodman, S. B., Yang, Y., Baker, S. W.
2021; 71 (1): 86–98
- **Regenerative Approaches for the Treatment of Large Bone Defects.** *Tissue engineering. Part B, Reviews*
Stahl, A., Yang, Y. P.
2020
- **The effects of tubular structure on biomaterial aided bone regeneration in distraction osteogenesis** *JOURNAL OF ORTHOPAEDIC TRANSLATION*
Pan, Q., Li, Y., Xu, J., Kang, Y., Li, Y., Wang, B., Yang, Y., Lin, S., Li, G.
2020; 25: 80–86
- **Development of PLGA-PEG-COOH and gelatin-based microparticles dual delivery system and E-beam sterilization effects for controlled release of BMP-2 and IGF-1.** *Particle & particle systems characterization : measurement and description of particle properties and behavior in powders and other disperse systems*
Bai, Y., Moeinzadeh, S., Kim, S., Park, Y., Lui, E., Tan, H., Zhao, W., Zhou, X., Yang, Y. P.
2020; 37 (10)
- **Development of a Dual Hydrogel Model System for Vascularization.** *Macromolecular bioscience*
Kim, S., Pan, C., Yang, Y. P.
2020: e2000204
- **The Influence of Electron Beam Sterilization on In Vivo Degradation of beta-TCP/PCL of Different Composite Ratios for Bone Tissue Engineering.** *Micromachines*
Kang, J., Kaneda, J., Jang, J., Sakthiabirami, K., Lui, E., Kim, C., Wang, A., Park, S., Yang, Y. P.
2020; 11 (3)
- **Acoustic Patterning of Growth Factor for 3D Tissue Engineering.** *Tissue engineering. Part A*
Shanjani, Y., Siebert, S. M., Ker, D. F., Mercado-Pagan, A., Yang, Y. P.
2020
- **The efficacy of core decompression for steroidassociated osteonecrosisof the femoral head in rabbits.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*
Maruyama, M. n., Lin, T. n., Kaminow, N. I., Thio, T. n., Storaci, H. W., Pan, C. C., Yao, Z. n., Takagi, M. n., Goodman, S. B., Yang, Y. P.
2020

- **Administration of allogeneic mesenchymal stem cells in lengthening phase accelerates early bone consolidation in rat distraction osteogenesis model.** *Stem cell research & therapy*
Yang, Y. n., Pan, Q. n., Zou, K. n., Wang, H. n., Zhang, X. n., Yang, Z. n., Lee, W. Y., Wei, B. n., Gu, W. n., Yang, Y. P., Lin, S. n., Li, G. n.
2020; 11 (1): 129
- **Cell-Based and Scaffold-Based Therapies for Joint Preservation in Early-Stage Osteonecrosis of the Femoral Head: A Review of Basic Research.** *JBJS reviews*
Maruyama, M., Lin, T., Pan, C., Moeinzadeh, S., Takagi, M., Yang, Y. P., Goodman, S. B.
2019
- **Ruminants: Evolutionary past and future impact.** *Science (New York, N.Y.)*
Ker, D. F., Yang, Y. P.
2019; 364 (6446): 1130–31
- **A simple layer-stacking technique to generate biomolecular and mechanical gradients in photocrosslinkable hydrogels.** *Biofabrication*
Ko, H., Suthiwanich, K., Mary, H., Zanganeh, S., Hu, S., Ahadian, S., Yang, Y. P., Choi, G., Fetah, K., Niu, Y., Mao, J., Khademhosseini, A.
2019
- **Effect of Plasma Treatment and Its Post Process Duration on Shear Bonding Strength and Antibacterial Effect of Dental Zirconia.** *Materials (Basel, Switzerland)*
Park, C., Park, S., Yun, K., Ji, M., Kim, S., Yang, Y. P., Lim, H.
2018; 11 (11)
- **Effect of Plasma Treatment and Its Post Process Duration on Shear Bonding Strength and Antibacterial Effect of Dental Zirconia** MATERIALS
Park, C., Park, S., Yun, K., Ji, M., Kim, S., Yang, Y., Lim, H.
2018; 11 (11)
- **Identifying deer antler uhrf1 proliferation and s100a10 mineralization genes using comparative RNA-seq.** *Stem cell research & therapy*
Ker, D. F., Wang, D., Sharma, R., Zhang, B., Passarelli, B., Neff, N., Li, C., Maloney, W., Quake, S., Yang, Y. P.
2018; 9 (1): 292
- **Effect of Electron Beam Sterilization on Three-Dimensional-Printed Polycaprolactone/Beta-Tricalcium Phosphate Scaffolds for Bone Tissue Engineering** TISSUE ENGINEERING PART A
Bruyas, A., Moeinzadeh, S., Kim, S., Lowenberg, D. W., Yang, Y.
2019; 25 (3-4): 248–56
- **The effects of a functionally-graded scaffold and bone marrow-derived mononuclear cells on steroid-induced femoral head osteonecrosis.** *Biomaterials*
Maruyama, M., Nabeshima, A., Pan, C., Behn, A. W., Thio, T., Lin, T., Pajarinen, J., Kawai, T., Takagi, M., Goodman, S. B., Yang, Y. P.
2018; 187: 39–46
- **Tunable Elastomers with an Antithrombotic Component for Cardiovascular Applications** ADVANCED HEALTHCARE MATERIALS
Stahl, A. M., Yang, Y.
2018; 7 (16)
- **Systematic characterization of 3D-printed PCL/#-TCP scaffolds for biomedical devices and bone tissue engineering: influence of composition and porosity.** *Journal of materials research*
Bruyas, A., Lou, F., Stahl, A. M., Gardner, M., Maloney, W., Goodman, S., Yang, Y. P.
2018; 33 (14): 1948-1959
- **Tunable Elastomers with an Antithrombotic Component for Cardiovascular Applications.** *Advanced healthcare materials*
Stahl, A. M., Yang, Y. P.
2018: e1800222
- **Functionally Graded, Bone- and Tendon-Like Polyurethane for Rotator Cuff Repair** ADVANCED FUNCTIONAL MATERIALS
Ker, D., Wang, D., Behn, A., Wang, E., Zhang, X., Zhou, B., Mercado-Pagan, A., Kim, S., Kleimeyer, J., Gharaibeh, B., Shanjani, Y., Nelson, D., Safran, et al
2018; 28 (20)
- **Investigating Regeneration** DEVELOPMENTAL CELL
Marshall, W. F., Alvarado, A., Shaw, T., Tanaka, E. M., Unguez, G. A., Poss, K., Kusumi, K., Amaya, E., Seifert, A. W., Yang, Y., Dev Cell Editorial Team
2017; 43 (4): 373–76

- **Functional Outcomes of Heparin-Binding Epidermal Growth Factor-Like Growth Factor for Regeneration of Chronic Tympanic Membrane Perforations in Mice** *TISSUE ENGINEERING PART A*
Maria, P. L., Gottlieb, P., Maria, C. S., Kim, S., Puria, S., Yang, Y. P.
2017; 23 (9-10): 436-444
- **Functional Outcomes of Heparin Binding - Epidermal Growth Factor Like Growth Factor for Regeneration of Chronic Tympanic Membrane Perforations in Mice.** *Tissue engineering. Part A*
Santa Maria, P. L., Gotlieb, P., Santa Maria, C., Puria, S., Kim, S., Yang, Y. P.
2017
- **Endothelial pattern formation in hybrid constructs of additive manufactured porous rigid scaffolds and cell-laden hydrogels for orthopedic applications** *JOURNAL OF THE MECHANICAL BEHAVIOR OF BIOMEDICAL MATERIALS*
Shanjani, Y., Kang, Y., Zarnescu, L., Bowden, A. K., Koh, J., Ker, D. F., Yang, Y.
2017; 65: 356-372
- **Additive Manufacturing of Vascular Grafts and Vascularized Tissue Constructs.** *Tissue engineering. Part B, Reviews*
Elomaa, L. n., Yang, Y. P.
2017; 23 (5): 436–50
- **Single Administration of a Sustained-Release Formulation of KB-R7785 Inhibits Tympanic Membrane Regeneration in an Animal Model** *JOURNAL OF INTERNATIONAL ADVANCED OTOLGY*
Maria, P. L., Maria, C. S., Kim, S., Yang, Y. P.
2016; 12 (3): 237-240
- **No systemic exposure of transtympanic heparin-binding epidermal growth factor like growth factor.** *Drug and chemical toxicology*
Santa Maria, P. L., Kim, S., Yang, Y. P.
2016; 39 (4): 451-454
- **Engineering a Dual-Layer Chitosan-Lactide Hydrogel To Create Endothelial Cell Aggregate-Induced Microvascular Networks In Vitro and Increase Blood Perfusion In Vivo** *ACS APPLIED MATERIALS & INTERFACES*
Kim, S., Kawai, T., Wang, D., Yang, Y.
2016; 8 (30): 19245-19255
- **Synthesis and characterization of polycaprolactone urethane hollow fiber membranes as small diameter vascular grafts** *MATERIALS SCIENCE & ENGINEERING C-MATERIALS FOR BIOLOGICAL APPLICATIONS*
Mercado-Pagan, A. E., Stahl, A. M., Ramseier, M. L., Behn, A. W., Yang, Y.
2016; 64: 61-73
- **In Response to the Letter to the Editor Regarding: Heparin Binding-Epidermal Growth Factor-Like Growth Factor for the Regeneration of Chronic Tympanic Membrane Perforations in Mice.** *Tissue engineering. Part A*
Santa Maria, P. L., Kim, S., Varsak, Y. K., Yang, Y. P.
2016; 22 (5-6): 570-571
- **In Response to the Letter to the Editor Regarding: Heparin Binding-Epidermal Growth Factor-Like Growth Factor for the Regeneration of Chronic Tympanic Membrane Perforations in Mice** *TISSUE ENGINEERING PART A*
Maria, P., Kim, S., Varsak, Y., Yang, Y.
2016; 22 (5-6): 570-571
- **A novel bioprinting method and system for forming hybrid tissue engineering constructs** *BIOFABRICATION*
Shanjani, Y., Pan, C. C., Elomaa, L., Yang, Y.
2015; 7 (4)
- **Geometrical versus Random beta-TCP Scaffolds: Exploring the Effects on Schwann Cell Growth and Behavior** *PLOS ONE*
Sweet, L., Kang, Y., Czisch, C., Witek, L., Shi, Y., Smay, J., Plant, G. W., Yang, Y.
2015; 10 (10)
- **Development of mRuby2-Transfected C3H10T1/2 Fibroblasts for Musculoskeletal Tissue Engineering** *PLOS ONE*
Ker, D. F., Sharma, R., Wang, E. T., Yang, Y. P.
2015; 10 (9)

- **Heparin Binding Epidermal Growth Factor-Like Growth Factor Heals Chronic Tympanic Membrane Perforations With Advantage Over Fibroblast Growth Factor 2 and Epidermal Growth Factor in an Animal Model** *OTOLOGY & NEUROTOLOGY*
Maria, P. L., Weierich, K., Kim, S., Yang, Y. P.
2015; 36 (7): 1279-1283
- **Heparin Binding Epidermal Growth Factor-Like Growth Factor Heals Chronic Tympanic Membrane Perforations With Advantage Over Fibroblast Growth Factor 2 and Epidermal Growth Factor in an Animal Model.** *Otology & neurotology : official publication of the American Otological Society, American Neurotology Society [and] European Academy of Otology and Neurotology*
Santa Maria, P. L., Weierich, K., Kim, S., Yang, Y. P.
2015; 36 (7): 1279-83
- **Heparin Binding-Epidermal Growth Factor-Like Growth Factor for the Regeneration of Chronic Tympanic Membrane Perforations in Mice** *TISSUE ENGINEERING PART A*
Maria, P. L., Kim, S., Varsak, Y. K., Yang, Y. P.
2015; 21 (9-10): 1483-1494
- **Development and evaluation of elastomeric hollow fiber membranes as small diameter vascular graft substitutes.** *Materials science & engineering. C, Materials for biological applications*
Mercado-Pagán, Á. E., Kang, Y., Findlay, M. W., Yang, Y.
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