

George Zhuo Tan

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Education

PhD.	July 2015	Industrial & Systems Engineering, North Carolina State University
M.IE.	Dec 2012	Industrial & Systems Engineering, North Carolina State University
B.S.	May 2009	Statistics, Communication University of China

Research Interests

Advanced Manufacturing for Tissue Engineering, Biomedical Design and Instrumentation, Membrane Filtration Technology, System Engineering for Remanufacturing

Professional Positions Held

Sep 2016 - Present	Assistant Professor Texas Tech University, Lubbock, TX
Aug 2015 – Aug 2016	Project Development Engineer Polyzen Inc., Apex, NC
Aug 2010 – July 2015	Research and Teaching Assistant North Carolina State University, Raleigh, NC
Mar 2009 - Jun 2010	Assistant Systems Engineer China Film Crest Digital Media Co. Ltd., Beijing, China

Publications

Peer-reviewed Journals

- Zhou, Y., Tan, G.Z., (2017) Fabrication of Nanofiber Mats with Nanostructure Gradient by Cone Electrospinning, *Nanomaterials and Nanotechnology*, In Review
- Zhao, X., Zhou, Y., Tran, P., French, A., Reid, T., Nuraje, N., Klein, D., Morse A., Tan, G.Z. (2017) Anti-biofouling Conductive Ultrafiltration Membrane Incorporated with AgNP, *Water and Environment Journal*, In Review
- Tan, Z., Havell, E. A., Orndorff, P. E., & Shirwaiker, R. A. (2017). Antibacterial efficacy and cytotoxicity of low intensity direct current activated silver–titanium implant system prototype. *BioMetals*, 30(1), 113-125.
- Cavanaugh, D.L., Tan, Z.G., Norris, J.P., Hardee, A., Weinhold, P.S., Dahners, L.E., Orndorff, P.E. and Shirwaiker, R.A., (2016). Evaluation of silver - titanium implants activated by low intensity direct current for orthopedic infection control: An *in vitro* and *in vivo* study. *Journal of Biomedical Materials Research Part B: Applied Biomaterials*. 104(5), 1023–1031

- Tan, Z., Xu, G., Orndorff, P. E., & Shirwaiker, R. A. (2016). Effects of electrically activated silver–titanium implant system design parameters on time-kill curves against *Staphylococcus aureus*. *Journal of Medical and Biological Engineering*, 36(3), 325-333.
- Narayanan, L.K., Kumar, A., Tan, Z., Bernacki, S., Starly, B. & Shirwaiker, A.R. (2015) Alginate Microspheroid Encapsulation and Delivery of MG-63 Cells into Polycaprolactone Scaffolds: A New Biofabrication Approach for Tissue Engineering Constructs. *Journal of Nanotechnology in Engineering and Medicine*. 6(2), 021003.
- Tan, Z., Orndorff, P.E. & Shirwaiker, R.A. (2015) Modified Pharmacokinetic/Pharmacodynamic model for electrically activated silver-titanium implant system. *Biomaterials & Biomedical Engineering*, 2(3):127-141.
- Tan, Z., Ganapathy, A., Orndorff, P.E. & Shirwaiker, R.A. (2015) Effects of cathode design parameters on *in vitro* antimicrobial efficacy of electrically-activated silver-based iontophoretic system. *Journal of Materials Science: Materials in Medicine*, 26(1):1-10.
- Samberg, M.E., Tan, Z., Monteiro-Riviere, N.A., Orndorff, P.E. & Shirwaiker, R.A. (2012) Biocompatibility Analysis of an Electrically-activated Silver-based Antibacterial Surface System for Medical Device Applications. *Journal of Materials Science: Materials in Medicine*, 24(3), 755-760.
- Tan, Z., Wang, Y. & Li, Z., (2008) Factors Influencing the Modification of Crop-Plantation Structure in Hunan Province. *Forum on Science and Technology in China*, 12, 99-103.

Conference Proceedings and Magazines

- Zhou, Y., Tan, G.Z., Electrically-activated Ultrafiltration Membrane Incorporated with AgNP. 17th IEEE International Conference on Nanotechnology (IEEE NANO 2017), July 25-28, 2017
- Zhou, Y., Tan, G.Z., Electrospinning: Applications in Gradient Nano-bioscaffold Fabrication. 17th IEEE International Conference on Nanotechnology (IEEE NANO 2017), July 25-28, 2017
- Tan, Z., Shirwaiker, R.A., Orndorff, P.E. Determining Optimal Current Intensity and Duration for Electrically Activated Silver-Based Prophylactic Hip Implant Prototype Design. *Proceedings of the ASME 2013 Summer Bioengineering Conference*, Sunriver, OR, June 26-29, 2013.
- Shirwaiker, R.A., Tan, Z. & Cohen, P.H. (2013) Regenerative Medicine Manufacturing (cover article), *Industrial Engineer*, 45(8), 32-37.
- Tan, Z. & Wysk, R.A. (2012) An Applicable Strategy for Scheduling Optimization in Multi-stage Flexible Manufacturing. *2012 Industrial and Systems Engineering Research Conference*. Orlando, FL, May 19-23, 2012.
- Tan, Z. & Shirwaiker, R.A. (2012) A Review of Emerging Industrial and Systems Engineering Trends and Future Directions in Biomanufacturing. *2012 Industrial and Systems Engineering Research Conference*. Orlando, FL, May 19-23, 2012.

Presentations

Research Talks

- “Recent Advances in Electrospinning for Tissue Engineering”, Institute of Industrial and Systems Engineers Annual Conference 2017, Pittsburgh, PA
- “*In vitro* Modeling of the Antimicrobial Efficacy and Cytotoxicity of Dual-metal Implant System,” Institute of Industrial and Systems Engineers Annual Conference 2014, Montreal, Canada, Jun 2014.

- “Characterization of 3D-bioplotting of ϵ -Polycaprolactone for Tissue Engineering Applications,” Industrial & Systems Engineering Research Conference 2014, Montreal, Canada, Jun 2014.
- “Electrically Activated Multi-metal Orthopedic Implant Design for Antimicrobial Prophylaxis,” Institute of Industrial Engineers Annual Conference 2013, Puerto Rico, May 2013.
- “The Supply Chain Architecture for Autologous Cell Therapy,” Institute of Industrial Engineers Annual Conference 2013, May 2013.

Posters

- “Electrically Activated Titanium-Silver Implant System for Antimicrobial Prophylaxis and Treatment,” American Academy of Orthopaedic Surgeons-Orthopaedic Research Society Research Symposium, Chicago, IL, May 2014.
- “Assessment of the Biocompatibility of Electrically-activated Silver-based Implant System,” The 9th Graduate Student Research Symposium, North Carolina State University, Raleigh, NC, Mar 2014.
- “Mathematical Modeling of the Antimicrobial Efficacy of Electrically Activated Silver-based Prophylaxis,” The 3rd Annual Rehabilitation Engineering Center Symposium, Durham, NC, Mar 2014.
- “Antimicrobial Implant System Activated by Low Intensity Direct Current: Conceptual Design and *In vitro* Analysis,” Sigma Xi Annual Meeting & International research Conference 2013, Raleigh, NC, Nov 2013.
- “Characterization of the Direct Current Activated Dual-metal (Ag-Ti) Implant System,” The 8th Graduate Student Research Symposium, North Carolina State University, Raleigh, NC, Mar 2013.

Courses Taught

IE 5356: Biomedical Design and Manufacturing.

IE 3351: Manufacturing Engineering I.

ISE 315: Computer-aided Manufacturing

Honors and Awards

NSF Travel Grant Award	2014
Best Young Investigator Poster Award, American Academy of Orthopaedic Surgeons-Orthopaedic Research Society (AAOS-ORS) Research Symposium, Chicago, IL.	2014
Phase II of the Young Innovators Award , North Carolina State University, Raleigh, NC	2013
Edward P. Fitts Fellowship, North Carolina State University, Raleigh, NC	2010 - 2011
Student Leadership Award, Communication University of China, Beijing, China	2006 & 2008

Professional Involvement

Journal Reviewer - Critical Reviews in Biotechnology	Nov 2014 - Present
- Nanotechnology	Feb 2014 - Present

- Biomedical Materials	Sep 2015 - Present
- Biofabrication	Oct 2015 - Present
Session Chair, Biomedical Design and Manufacturing - II Modeling of Implants Industrial & Systems Engineering Research Conference (ISERC) (2014)	Jun 2014
Judge, 2014 Sigma Xi Student Research Showcase	Mar 2014
Conference Reviewer - Industrial & Systems Engineering Research Conference (ISERC) 2012	Feb 2012

Memberships

Student Member of Institute of Industrial Engineers (IIE)	2011 - present
Student Member of American Society of Mechanical Engineers (ASME)	2011 - present
Associate Member of Sigma Xi Scientific Research Society	2013 - present
Member of Alpha Pi Mu (Industrial Engineering Honorary Society)	2013 - present

Service and Leadership Activities

Volunteer, North Carolina State University Engineering Open House	2013 & 2014
Vice President, iCare Chinese Student Ministry at North Carolina State University	2013 - 2014
Tutor, Urban League Pre-College Program, North Carolina State University	2013
Tutor, ISE Summer Manufacturing Practicum, North Carolina State University	2013
Chief Coordinator, Student Fellowship at Raleigh Chinese Christian Church.	2012 - 2013