Yuan Tang, Ph.D.

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PRPFESSIONAL EXPERIENCE

2019 – present, Assistant Professor, Department of Bioengineering, University of Toledo, Toledo, Ohio

- Developing biomimetic breast cancer metastasis microfluidic assay.
- Testing a novel therapeutic for preventing cancer metastasis through modulation of circulating cancer cell-endothelium interaction.

2014 – 2019, Research Assistant Professor, Department of Mechanical Engineering, Temple University, Philadelphia, PA

- Developed a novel biomimetic tumor on-a-chip microfluidic assay for studying drug delivery systems in tumor microenvironment using an endothelial-tumor cell co-culture model. Cross validated the results using tumor xenograft model in nude mice.
- Established *in vitro* microfluidics-based and *in vivo* (intravital microscopy on rodent-cranial window model) assays for blood-brain barrier (BBB) function assessment.
- Developed protocols for harvesting primary endothelial cells/neutrophils from rodents and establishing 3D co-culture models in the microfluidics assay.

2014 – 2018, Senior Scientist, MedVas Concepts, LLC, Philadelphia, PA

Leading a team to design and develop a simple low-cost microfluidic platform for screening therapeutics and predicting *in vivo* response

- Developed a novel microfluidics-based biomimetic assay that allows real-time assessment of inflammatory response (neutrophil-endothelial interaction) as well as endothelial cell function in a realistic microvasculature geometry with physiologic shear conditions.
- Developed a biomimetic microfluidic platform featuring 3D co-culturing of organ specific endothelial cells and tissue cells for testing of therapeutics for treating inflammation (sepsis).

2011 – 2014, **Postdoctoral Fellow, Department of Biomedical Engineering, Widener University, Chester, PA**

- Developed a dual-agent-loaded liposome drug delivery system which achieved simultaneous delivery of chemotherapeutic and anti-angiogenic compounds for the treatment of multi-drug resistant breast cancer. Test the system using *in vivo* tumor xenograft and *in vitro* cell culture.
- Established a more efficient method for developing drug resistant breast cancer cell line from non-resistant parental cell line *in vitro*.

2011 (Jan) – 2011 (Oct), **Postdoctoral Fellow, Department of Biomedical Engineering, Widener University, Chester, PA**

- Developed an immunoliposome-based growth hormone (VEGF) drug delivery system for the treatment of myocardial infarction.

EDUCATION

2005 – 2010, Ph.D. in Biomedical Engineering, Florida International University, Miami, FL

Dissertation: *Cancer Therapy Combining Modalities of Hyperthermia and Chemotherapy: in vitro Cellular Response after Rapid Heat Accumulation in the Cancer Cell*

- Combined photothermotherapy and chemotherapy using a dual agent loaded PLGA polymer drug delivery system, for cancer treatment and modeled particle transport using COMSOL.

1998 – 2002, B.S. in Biomedical Engineering, Shanghai Jiao Tong University School of Medicine

PATENTS

1. Wang, B., Kiani, M. F., and **Tang, Y.** Compositions and methods for treatment of cancer, **U.S. Patent No. 10,188,728, Australian Patent No. 2013360302**

2. Kiani, M. F., Kilpatrick, L. E., **Tang, Y.**, and Soroush, F. Protein Kinase C-delta targeted therapy for treating radiation injury, International Application Number: PCT/US2018/036987

3. Kiani, M. F., Kilpatrick, L. E., and **Tang, Y.** Using a PKC-delta inhibitor to prevent tumor cell metastasis, U.S. Patent Application No. 16/621,720, 12/12/2019

HORNORS AND AWARDS

- Florida International University College of Engineering & Computing Outstanding Ph.D. graduate award (2010)
- Florida International University 2009-2010 UGS Dissertation Year Fellowship

PEER REVIEWED PUBLICATIONS

1. Soroush, F., **Tang, Y.**, Mustafa, O., Sun, S., Yang, Q., Kilpatrick, L. E., and Kiani, M. F. (2019) Neutrophil-Endothelial Interactions of Murine Cells is not a Good Predictor of Their Interactions in Human Cells. *FASEB J*, 10.1096/fj.201900048R

2. Yang, Q., Langston, JC., **Tang, Y.**, Kiani, MF., Kilpatrick, LE. (2019) The Role of Tyrosine Phosphorylation of Protein Kinase C Delta in Infection and Inflammation. *Int J Mol Sci*, Mar 26;20(6). doi: 10.3390/ijms20061498. Review.

3. Soroush, F., **Tang, Y.**, Guglielmo, K., Engelmann, A., Liverani, E., Langston, J., Sun, S., Kunapuli, S., Kiani, M. F., and Kilpatrick, L. E. (2019) Protein Kinase C-Delta (PKCdelta) Tyrosine Phosphorylation is a Critical Regulator of Neutrophil-Endothelial Cell Interaction in Inflammation. *Shock* **51**, 538-547

4. **Tang, Y.**, Soroush, F., Sun, S., Liverani, E., Langston, J. C., Yang, Q., Kilpatrick, L. E., and Kiani, M. F. (2018) Protein Kinase C-delta Inhibition Protects Blood-Brain Barrier from Sepsis-Induced Vascular

Damage. *J Neuroinflammation,* **15**:309, DOI:https://doi.org/10.1186/s12974-018-1342-y

5. Soroush, F.*, **Tang, Y.***, Zaidi, H. M., Sheffield, J. B., Kilpatrick, L. E., and Kiani, M. F. (2018) PKCdelta inhibition as a novel medical countermeasure for radiation-induced vascular damage. *FASEB J*, fj201701099

6. **Tang, Y.**, Soroush, F., Tong, Z., Kiani, M. F., and Wang, B. (2017) Targeted multidrug delivery system to overcome chemoresistance in breast cancer. *Int J Nanomedicine* **12**, 671-681

7. **Tang, Y.**, Soroush, F., Sheffield, J. B., Wang, B., Prabhakarpandian, B., and Kiani, M. F. (2017) A Biomimetic Microfluidic Tumor Microenvironment Platform Mimicking the EPR Effect for Rapid Screening of Drug Delivery Systems. *Sci Rep* **7**, 9359

8. **Tang, Y.**, Wang, Y., Kiani, M. F., and Wang, B. (2016) Classification, Treatment Strategy, and Associated Drug Resistance in Breast Cancer. *Clin Breast Cancer* **16**, 335-343

9. Soroush, F., Zhang, T., King, D. J., **Tang, Y.**, Deosarkar, S., Prabhakarpandian, B., Kilpatrick, L. E., and Kiani, M. F. (2016) A novel microfluidic assay reveals a key role for protein kinase C delta in regulating human neutrophil-endothelium interaction. *J Leukoc Biol* **100**, 1027-1035

10. **Tang, Y.**, Wang, Y., Deosarkar, S., Soroush, F., Kiani, M. F., and Wang, B. (2015) Fast, Stable Induction of P-Glycoprotein-mediated Drug Resistance in BT-474 Breast Cancer Cells by Stable Transfection of ABCB1 Gene. *Anticancer Res* **35**, 2531-2538

11. **Tang, Y.***, Gan, X.*, Cheheltani, R., Curran, E., Lamberti, G., Krynska, B., Kiani, M. F., and Wang, B. (2014) Targeted delivery of vascular endothelial growth factor improves stem cell therapy in a rat myocardial infarction model. *Nanomedicine* **10**, 1711-1718

12. **Tang, Y.**, and McGoron, A. J. (2013) Increasing the rate of heating: a potential therapeutic approach for achieving synergistic tumour killing in combined hyperthermia and chemotherapy. *Int J Hyperthermia* **29**, 145-155

13. Lamberti, G., **Tang, Y.**, Prabhakarpandian, B., Wang, Y., Pant, K., Kiani, M. F., and Wang, B. (2013) Adhesive interaction of functionalized particles and endothelium in idealized microvascular networks. *Microvasc Res* **89**, 107-114

14. Manchanda, R., Fernandez-Fernandez, A., Carvajal, D. A., Lei, T., **Tang, Y.**, and McGoron, A. J. (2012) Nanoplexes for cell imaging and hyperthermia: in vitro studies. *J Biomed Nanotechnol* **8**, 686-694

15. Fernandez-Fernandez, A., Manchanda, R., Lei, T., Carvajal, D. A., **Tang, Y.**, Kazmi, S. Z., and McGoron, A. J. (2012) Comparative study of the optical and heat generation properties of IR820 and indocyanine green. *Mol Imaging* **11**, 99-113

16. Lei, T., Srinivasan, S., **Tang, Y.**, Manchanda, R., Nagesetti, A., Fernandez-Fernandez, A., and McGoron, A. J. (2011) Comparing cellular uptake and cytotoxicity of targeted drug carriers in cancer cell lines with different drug resistance mechanisms. *Nanomedicine* **7**, 324-332

17. Haider, W., Munroe, N., Tek, V., Gill, P. K., **Tang, Y.**, and McGoron, A. J. (2011) Cytotoxicity of Metal Ions Released from Nitinol Alloys on Endothelial Cells. *J Mater Eng Perform* **20**, 816-818

18. **Tang, Y.**, Lei, T., Manchanda, R., Nagesetti, A., Fernandez-Fernandez, A., Srinivasan, S., and McGoron, A. J. (2010) Simultaneous delivery of chemotherapeutic and thermal-optical agents to cancer cells by a polymeric (PLGA) nanocarrier: an in vitro study. *Pharm Res* **27**, 2242-2253

19. **Tang, Y.**, and McGoron, A. J. (2009) Combined effects of laser-ICG photothermotherapy and doxorubicin chemotherapy on ovarian cancer cells. *J Photochem Photobiol B* **97**, 138-144
* Both authors contributed equally to this work.

PRESTNTATIONS AND ABSTRACTS IN CONFERENCES

1. Yang, Q., Langston, J. C., **Tang, Y.**, Soroush, F., Kiani, M. F., and Kilpatrick, L. E. (2019) A Biomimetic Assay for Rapid Screening of Differential Response of Anti-Inflammatory Therapeutics in Mouse and Human Cells. In *AHA Scientific Sessions 2019* Vol. 140 pp. A14656-A14656, Philadelphia, Pennsylvania
2. **Tang, Y.**, Langston, J. C., Yang, Q., Kilpatrick, L. E., and Kiani, M. F. (2019) Inhibition of Endothelial Protein Kinase C-delta Modulates Lung Metastasis - A Microfluidic Study. In *BMES*, Philadelphia, Pennsylvania
3. Langston, J. C., Yang, Q., **Tang, Y.**, Soroush, F., Kiani, M. F., and Kilpatrick, L. E. (2019) Neutrophil-Lung Endothelial Cell Interactions in Murine Cells Do Not Always Predict Their Interactions in Human Cells. In *University of Pennsylvania Respiration Research Retreat*, Philadelphia, Pennsylvania
4. **Tang, Y.**, Langston, J. C., Yang, Q., Kilpatrick, L. E., and Kiani, M. F. (2019) Inhibition of Endothelial Protein Kinase C-delta Modulates Lung Metastasis - A Microfluidic Study. In *University of Pennsylvania Respiration Research Retreat*, Philadelphia, Pennsylvania
5. Yang, Q., Soroush, F., **Tang, Y.**, Sun, S., Kilpatrick, L. E., and Kiani, M. F. (2018) Neutrophil-Endothelia Interactions in Mice Do Not Always Predict their Interactions in Humans. In *BMES*, Atlanta, Georgia
6. Langston, J. C., Soroush, F., Guglielmo, K., Engelmann, A., Elisabetta, L., Sun, S., Kunapuli, S., **Tang, Y.**, Kiani, M. F., and Kilpatrick, L. E. (2018) Protein Kinase C-Delta (PKC&[delta]) Tyrosine Phosphorylation Is a Critical Regulator of Neutrophil-Endothelial Cell Interactions in Inflammation. In *BMES*, Atlanta, Georgia
7. **Tang, Y.**, Soroush, F., Liverani, E., Sun, S., Langston, J. C., Kilpatrick, L. E., and Kiani, M. F. (2018) PROTEIN KINASE C-DELTA INHIBITION PROTECTS THE BRAIN FROM SEPSIS-INDUCED VASCULAR DAMAGE. In *SHOCK* Vol. 49 pp. 28-28, Scottsdale, Arizona (Oral Presentation)
8. Soroush, F., **Tang, Y.**, Sun, S., Langston, J. C., Kilpatrick, L. E., and Kiani, M. F. (2018) NEUTROPHIL-ENDOTHELIAL INTERACTIONS IN MICE DO NOT ALWAYS PREDICT THEIR INTERACTIONS IN HUMANS. In *SHOCK* Vol. 49 pp. 55-56, Scottsdale, Arizona
9. **Tang, Y.**, Soroush, F., Liverani, E., Sun, S., Langston, J. C., Yang, Q., Kilpatrick, L. E., and Kiani, M. F. (2018) Inhibition of Protein Kinase C-delta Mitigates Sepsis-Induced Vascular Damage in Brain. In *44th NEBEC*, Philadelphia, Pennsylvania
10. Soroush, F., **Tang, Y.**, Sun, S., Yang, Q., Kilpatrick, L. E., and Kiani, M. F. (2018) Neutrophil–endothelia Interactions in Mice Do Not Always Predict their Interactions in Humans. In *44th NEBEC*, Philadelphia, Pennsylvania (Oral Presentation)
11. Soroush, F., **Tang, Y.**, Sun, S., Langston, J. C., Kilpatrick, L. E., and Kiani, M. F. (2018) Protein Kinase C-DELTA Tyrosine Phosphorylation is a Critical Regulator of Neutrophil-Endothelial Cell Interactions in Inflammation. In *44th NEBEC*, Philadelphia, Pennsylvania
12. Buerk, D., **Tang, Y.**, Sun, S., Liverani, E., Kilpatrick, L. E., and Kiani, M. F. (2017) *In Vitro* and *In Vivo* Evaluation of an Inhibitor of Protein Kinase C&[delta] to Treat ARDS. In *BMES*, Phoenix, Arizona (Oral Presentation)
13. Soroush, F., **Tang, Y.**, Kilpatrick, L. E., and Kiani, M. F. (2017) A biomimetic assay for predicting the

response of novel anti-inflammatory therapeutics in humans. In *BMES*, Phoenix, Arizona
14. **Tang, Y.**, Soroush, F., Prabhakarpandian, B., Kilpatrick, L. E., and Kiani, M. F. (2017) Microvascular network on a chip. In *Singh Nanovation Conference*, Philadelphia, Pennsylvania
15. Kiani, M. F., **Tang, Y.**, Soroush, F., Prabhakarpandian, B., and Kilpatrick, L. E. (2017) MICROVASCULAR NETWORK ON A CHIP. In *SHOCK* Vol. 47 pp. 25-25, Fort Lauderdale, Florida
16. Kiani, M. F., Soroush, F., **Tang, Y.**, Prabhakarpandian, B., and Kilpatrick, L. E. (2017) MODELING PKC-DELTA REGULATION OF NEUTROPHIL-ENDOTHELIAL INTERACTIONS WITH A NOVEL MICROFLUIDICS DEVICE. In *SHOCK* Vol. 47 pp. 29-29, Fort Lauderdale, Florida
17. Hooshdaran, B., Kolpakov, M., Guo, X., Bashkirova, Y., Wang, B., Schappel, W., **Tang, Y.**, Kiani, M. F., and Sabri, A. (2016) Targeted Delivery of a Dual Cathepsin G and Chymase Inhibitor by Immunoliposomes Augments Cardioprotection in Mice. In *AHA Scientific Sessions 2016* Vol. 134 pp. A16159-A16159, New Orleans, Louisiana
18. **Tang, Y.**, Soroush, F., Wang, B., Prabhakarpandian, B., and Kiani, M. F. (2016) Recreating 3D Tumor Microenvironment on a Chip for Screening Drug Delivery Systems. In *BMES*, Minneapolis, Minnesota (Oral Presentation)
19. Soroush, F., **Tang, Y.**, Zhang, T., King, D., Deosarkar, S., Prabhakarpandian, B., Kilpatrick, L. E., and Kiani, M. F. (2016) A Novel Bioinspired Microfluidic Assay for Investigation of the Role of Protein Kinase C-delta (PKC&[delta]) in Human Neutrophil-Endothelium Interaction During Acute Inflammation. In *BMES*, Minneapolis, Minnesota (Oral Presentation)
20. Zhou, J., Rizzo, M., Tang, Y., Issekutz, A., Kiani, M.F., Wang, B. (2016) A Targeted Drug Delivery System for Selective Deliver of Insulin-like Growth Factor-1 to Infarcted Myocardium to Improve Stem Cell Survival. In *BMES*, Minneapolis, Minnesota
21. Garlapati, P., Sani, E., **Tang, Y.**, Kiani, M. F., Kim, B., and Wunder, S. (2016) Flow of lipid vesicles and nanoparticles through microfluidic channels. In *252nd ACS National Meeting* Vol. 252, Philadelphia, Pennsylvania
22. Soroush, F., **Tang, Y.**, Deosarkar, S., Prabhakarpandian, B., Kilpatrick, L. E., and Kiani, M. F. (2016) THE ROLE OF PKC delta IN HUMAN NEUTROPHIL-ENDOTHELIAL INTERACTIONS DURING ACUTE INFLAMMATION. In *SHOCK* Vol. 45 pp. 62-62, Austin, Texas
23. **Tang, Y.**, Soroush, F., Deosarkar, S., Wang, B., Prabhakarpandian, B., and Kiani, M. F. (2016) A physiological model of the tumor microenvironment for screening drug delivery systems. In *AACR Annual Meeting 2016* Vol. 76 pp. 3382-3382, New Orleans, Louisiana
24. **Tang, Y.**, Soroush, F., Deosarkar, S., Wang, B., Prabhakarpandian, B., and Kiani, M. F. (2016) A Novel Synthetic Tumor Platform for Screening Drug Delivery systems. In *Experimental Biology* Vol. 30 pp. 698.697-698.697, San Diego, California
25. Soroush, F., **Tang, Y.**, Prabhakarpandian, B., Kilpatrick, L. E., and Kiani, M. F. (2016) A Novel Bioinspired Microfluidic Assay for Investigation of the Role of Protein Kinase C-delta (PKCδ) in Human Neutrophil-Endothelium Interaction During Acute Inflammation. In *Experimental Biology* Vol. 30 pp. 1177.1173-1177.1173, San Diego, California
26. **Tang, Y.**, Soroush, F., Wang, B., Prabhakarpandian, B., and Kiani, M. F. (2015) Adhesion Profile of Dual-Agent Functionalized Nanoparticles in a Synthetic Microvascular Network. In *BMES* Tampa, Florida
27. Hooshdaran, B., Kolpakov, M., Guo, X., Wang, T., Vlasenko, L., **Tang, Y.**, Kiani, M. F., and Sabri, A. (2015) Immunoliposome-Based Delivery of Inflammatory Serine Protease Inhibitor Offers Cardiac

Protection After Myocardial Ischemia in Mice. In *BMES*, Tampa, Florida

28. **Tang, Y.**, Zhou, J., and Wang, B. (2015) Identify hemodynamic factors implicated in differentiation of stem cells into endothelial cells. In *41st NEBEC* pp. 1-2, Troy, New York

29. **Tang, Y.**, Lamberti, G., Curran, E., Kiani, M. F., and Wang, B. (2014) Development and characterization of a multi-drug resistant Her-2/neu positive breast cancer cell line (58.6). In *Experimental Biology* Vol. 28 p. 58.56, San Diego, California (Oral Presentation)

30. Lamberti, G., **Tang, Y.**, Kiani, M. F., and Wang, B. (2014) Characterization of particle-endothelium interaction using particles functionalized with dual antibodies in a complex synthetic microvascular network (674.3). In *Experimental Biology* Vol. 28 p. 674.673, San Diego, California

31. McGoron, A. J., Srinivasan, B., Lei, T., **Tang, Y.**, and Manchanda, R. (2013) Combined photothermal therapy and chemotherapy in cancer using HER-2 targeted PLGA nanoparticles. In *SPIE BiOS* Vol. 8582, SPIE, San Francisco, California

32. Lamberti, G., **Tang, Y.**, Prabhakarpandian, B., Wang, Y., Pant, K., Kiani, M. F., and Wang, B. (2013) Adhesive Interaction of Functionalized Particles and Endothelium in Idealized Microvascular Networks. In *Experimental Biology* Vol. 27 pp. lb641-lb641, Boston, Massachusetts

33. **Tang, Y.**, Gan, X., Cheheltani, R., Lamberti, G., Krynska, B., Kiani, M. F., and Wang, B. (2012) Targeted Delivery of Vascular Endothelial Growth Factor Improves Stem Cell Survival in Infarcted Myocardium in Rats. In *BMES*, Atlanta, Georgia (Oral Presentation)

34. **Tang, Y.**, Cheheltani, R., Lamberti, G., Kiani, M. F., and Wang, B. (2012) Targeted Multidrug Delivery System for Overcoming Chemoresistance in Breast Cancer. In *BMES*, Atlanta, Georgia

35. Lamberti, G., **Tang, Y.**, Prabhakarpandian, B., Pant, K., Kiani, M. F., and Wang, B. (2012) Adhesion Patterns of Functionalized Particles Are Significantly Different Between Parallel Plate Flow Chambers and Bifurcating Microchannels. In *BMES*, Atlanta, Georgia

36. **Tang, Y.**, Curran, E., Kiani, M. F., and Wang, B. (2012) Targeted delivery of vascular endothelial growth factor to enhance the stem cell therapy in treating myocardial infarction in rats. In *38th NEBEC* pp. 418-419, Philadelphia, Pennsylvania

37. **Tang, Y.**, Lei, T., Manchanda, R., Nagesetti, A., Fernandez-Fernandez, A., and Mcgoron, A. J. (2010) A Novel Dual-Agent Loaded PLGA Nanoparticle for the Simultaneous Delivery of Chemotherapy and Hyperthermia. In *BMES*, Austin, Texas

38. Lei, T., Fernandez-Fernandez, A., **Tang, Y.**, Carvajal, D., Manchanda, R., Kazmi, S. Z., and McGoron, A. J. (2010) A comparative study of IR-820 and indocyanine green (ICG). In *SNMMI Annual Meeting* Vol. 51 p. 225

39. Manchanda, R., Lei, T., **Tang, Y.**, Fernandez-Fernandez, A., and McGoron, A. J. (2010) Cellular Uptake and Cytotoxicity of a Novel ICG-DOX-PLGA Dual Agent Polymer Nanoparticle Delivery System. In *26th SBEC* pp. 228-231, Springer Berlin Heidelberg, College Park, Maryland

40. Lei, T., Srinivasan, S., **Tang, Y.**, Manchanda, R., Fernandez-Fernandez, A., and Mcgoron, A. J. (2010) Targeted Delivery of Doxorubicin by PLGA Nanoparticles Increases Drug Uptake in Cancer Cell Lines. In *26th SBEC* pp. 224-227, Springer Berlin Heidelberg, College Park, Maryland

41. **Tang, Y.**, and McGoron, A. J. (2010) The role of temperature increase rate in combinational hyperthermia chemotherapy treatment. In *SPIE BiOS* Vol. 7565, SPIE, San Francisco, California (Oral Presentation)

42. **Tang, Y.**, and McGoron, A. J. (2009) Interaction of dye-enhanced photothermotherapy and chemotherapy in the treatment of cancer: an in vitro study. In *SPIE BiOS* Vol. 7164, SPIE, San Francisco, California