

YOUHUA TAN

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Engineering, Hong Kong Polytechnic University, Hung Hom,
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EMPLOYMENT

Assistant Professor Hong Kong Polytechnic University since July 2015

EDUCATION

Postdoctoral Fellow 2011-2015
University of Illinois at Urbana-Champaign, USA

Research Associate 2010 -2011
City University of Hong Kong, Hong Kong

Ph.D. in Mechanical and Biomedical Engineering 2010
City University of Hong Kong, Hong Kong
Dissertation title: *Cell mechanical modeling and mechanical properties characterization*

Bachelor in Mechanical Engineering 2005
University of Science and Technology of China, China

RESEARCH INTERESTS

Mechanobiology; mechano-oncology; cell mechanics; mechanotransduction; cancer stem cell; micro/nano biotechnology.

PUBLICATIONS

Refereed Journal Papers (**contributed equally; #: corresponding author*):

1. Wang, R., Chow, Y.T., Chen S., Ma, D., Luo, T., **Tan, Y.#**, Sun D. # (2017) Magnetic force-driven in Situ selective intracellular delivery, *Nature Communications*, in preparation.
2. **Tan, Y.***, Wood, A.R.*, Jia, Q.*, Zhou, W., Luo, J., Yang, F., Chen, J., Chen, J., Sun, J., Seong, J., Tajik, A., Singh, R., Wang, N. (2017) Soft matrices downregulate FAK activity to promote growth of tumor-repopulating cells, *Biochemical and Biophysical Research Communications* 483, 456.
3. **Tan, Y.***, Tajik, A.*, Chen, J.*, Jia, Q., Chowdhury, F., Wang, L., Chen, J., Zhang, S., Hong, Y., Yi, H., Wu, D.C., Zhang, Y., Wei, F., Poh, Y-C., Seong, J., Singh, R., Lin, L-J., Doğanay, S., Li, Y., Jia, H., Ha, T., Wang, Y., Huang, B., Wang, N. (2014). Matrix softness regulates plasticity of tumor-repopulating cells via H3K9 demethylation and Sox2 expression, *Nature Communications* 5, 4619.

4. Poh, Y-C., Chen, J., Hong, Y., Yi, H., Zhang, S., Chen, J., Wu, D.C., Wang, L., Jia, Q., Singh, R., Yao, W., **Tan, Y.**, Tajik, A., Tanaka, T., Wang, N., (2014). Generation of organized germ layers from a single mouse embryonic stem cell. *Nature Communications* 5, 4000.
5. **Tan, Y.***, Liu, J. *, Zhang, H., Zhang, Y., Xu, P., Chen, J., Poh, Y-C., Wang, N., Huang, B. (2012). Soft fibrin gels promote selection and growth of tumorigenic cells. *Nature Materials* 11, 734-741.
Highlighted by: Shin, J-W., and Discher, D.E. (2012). Cell culture: Soft gels select tumorigenic cells. *Nature Materials* 11, 662-663.
6. **Tan, Y.**, Kong, C-W., Chen, S., Cheng, S.H., Li, R.A., Sun, D. (2012). Probing the mechanobiological properties of human embryonic stem cells in cardiac differentiation by optical tweezers. *Journal of Biomechanics* 45, 123-128.
7. **Tan, Y.**, Fung, T-K., Wan, H., Wang, K., Leung, A.Y.H., Sun, D. (2011). Biophysical characterization of hematopoietic cells from normal and leukemic sources with distinct primitiveness. *Applied Physics Letters* 99, 083702.
8. **Tan, Y.**, Leung, A.Y.H., Wang, K., Fung, T-K., Sun, D. (2011). Nanomechanical Characterization of Myeloblasts from Cancer Patients with Optical Tweezers. *IEEE Nanotechnology Magazine* 5, 17-21 (Cover page).
9. **Tan, Y.#**, Sun, D., Huang, W., Cheng, S.H. (2010). Characterizing Mechanical Properties of Biological Cells by Microinjection. *IEEE Transactions on NanoBioScience* 9, 171-180.
10. **Tan, Y.**, Sun, D., Wang, J., Huang, W. (2010). Mechanical Characterization of Human Red Blood Cells under Different Osmotic Conditions by Robotic Manipulation with Optical Tweezers. *IEEE Transactions on Biomedical Engineering* 57, 1816-1825.
11. **Tan, Y.#**, Sun, D., Huang, W. (2010). Mechanical Modeling of Red Blood Cells during Optical Stretching. *Journal of Biomechanical Engineering-Transactions of the ASME* 132, 044504.
12. **Tan, Y.#**, Sun, D., Huang, W., Cheng, S.H. (2008). Mechanical Modeling of Biological Cells in Microinjection. *IEEE Transactions on NanoBioScience* 7, 257-266.
13. **Tan, Y.**, Xiao, S., Guo, R., Wang, X., Huang, W. (2007). Design and Application of Superresolved Phase Plates. *Journal of University of Science and Technology of China* 37, 748-752. (in Chinese)
14. **Tan, Y.**, Guo, R., Xiao, S., Huang, W. (2006). Design of Superresolved Phase Plates. *Journal of Laser Micro/Nanoengineering* 1, 281-287.

Invited talks and presentations:

1. Mechanical regulation of cancer cell functions. University of Hong Kong, September 30, 2015.
2. Mechanical regulation of tumor cell plasticity. Hong Kong Polytechnic University, February 11, 2015.
3. Soft tumor cells are highly tumorigenic. *The 7th World Congress of Biomechanics*, Boston, USA, July 2014.
4. Plasticity of tumor-repopulating cells is controlled by matrix softness. *The 7th World Congress of Biomechanics*, Boston, USA, July 2014.

5. Self-renewal memory of tumor-repopulating cells. *The 4th Annual Postdoctoral Research Symposium*, University of Illinois, Urbana, USA, January 2014
6. Mechanics and mechanotransduction of tumorigenic cells. *The 5th Sino-American Workshop on Biomedical Engineering and China-Oversea Joint Workshop on Biomechanics*, Beijing, China, August 2013.
7. Characterizing the micromechanical properties of myeloblasts from cancer patients with optical tweezers. *IEEE International Conference on Nano/Molecular Medicine and Engineering*, Hong Kong, December 2010.
8. Robotic manipulation of human red blood cells with optical tweezers for cell property characterization. *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Taipei, Taiwan, October 2010.
9. Mechanical characterization of human red blood cells by robotic manipulation with optical tweezers. *IEEE International Conference on Robotics and Biomimetics*, Guilin, China, December 2009.
10. Characterizing mechanical properties of biological cells using a microrobotic testing bed. *IEEE/RSJ International Conference on Intelligent Robots and Systems*, St. Louis, MO, October 2009.
11. A mechanical model of biological cells in microinjection. *IEEE International Conference on Robotics and Biomimetics*, Bangkok, Thailand, February 2009 (**Best Paper Award**).

GRANTS AND AWARDS

1. Shenzhen Science and Technology Innovation Commission Basic Research (STIC) 2017: Mechanical regulation of cancer stem cells and tumor progression and metastasis in hepatocellular carcinoma (01/01/2018-31/12/2020) (RMB 2,000,000) (Project# 20170248) (PI)
2. Project of Strategic Importance, Hong Kong Polytechnic University (PolyU Internal Grant) 2017: Biomechanical and Multiomics Characterization of Ocular Tissues during Myopic Development (02/05/2017-01/05/2020) (HK\$ 4,074,000) (Project# 1-ZE1A) (Co-PI)
3. Shenzhen Science and Technology Innovation Commission Basic Research--Exploration (STIC) 2017: Regulation of metastatic potential of cancer stem cells in hepatocellular carcinoma by cell mechanics (01/06/2017-31/05/2019) (RMB 400,000) (Project# JCYJ20170303160515987) (PI)
4. National Natural Science Foundation of China General Program (NSFC) 2016: Low cell stiffness regulates high tumorigenic and metastatic potential of hepatocellular carcinoma tumor-repopulating cells (01/01/2017-31/12/2020) (RMB 600,000) (Project# 11672255) (PI)
5. Research Grant Council Early Career Scheme (RGC ECS) 2016: Cell mechanics regulate tumorigenic potential of soft cancer stem-like cells in hepatocellular carcinoma (01/01/2018-31/12/2020) (HK\$ 750,000) (Project# 25209417) (PI)
6. Dean's Reserve for Intra-Faculty Collaboration Research, Hong Kong Polytechnic University (PolyU Internal Grant) 2016: Mechanical Regulation of Cancer Metastatic Potential and Tropism (01/08/2016-31/01/2018) (HK\$ 400,000) (Project# 1-ZVJ8) (PI)

7. Start-up Fund, Hong Kong Polytechnic University (PolyU Internal Grant) 2015: Regulation of Cell Phenotype and Function by Mechanical Forces with Healthcare Applications (01/09/2015-31/10/2018) (HK\$ 500,000) (Project# 1-ZE4Q) (PI)

STUDENT AWARDS

Best MSc Dissertation Award and Outstanding Academic Performance Award for Tang Xin in 2017 (Supervisor: Tan Youhua)

PROFESSIONAL ACTIVITIES

Editorial board member:

Journal of Advanced Biotechnology and Bioengineering since 2013

Reviewer for:

Scientific Reports; Journal of Biomechanics; Oncotarget; RSC Advances; PLoS ONE; European Biophysics Journal; Sensors; IEEE Transactions on Nanotechnology; Medical & Biological Engineering & Computing; World Journal of Mechanics; Micromachines; International Journal of Optomechatronics.

Conference Session Chair:

IEEE International Conference on Robotics and Biomimetics 2009;

IEEE International Conference on Nano/Molecular Medicine and Engineering 2010.