SIYU HE

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EDUCATION

Columbia University NY, USA
Ms leading to PhD student in Biomedical Engineering Aug. 2018 – Present

- Ms GPA: 3.92/4.0
- Current GPA: 4.11/4.0

Xian Jiaotong University Xi'an, China
B. S. in Physics, Honors Science Program Sep. 2013 – Jul. 2018

- Overall GPA: 87/100

Massachusetts Institute of Technology Cambridge, MA
Non-Degree Seeking in Physics Aug. 2016 – Dec. 2016

- GPA: 4.7/5.0

Texas A&M University TX, USA
Non-Degree Seeking in Physics Sep. 2015 – Jan. 2016

- GPA: 4.00/4.00

University of Notre Dame South Bend, IN
Non-Degree Seeking in Physics May. 2015 – Aug. 2015

- GPA: 6.00/6.00

RESEARCH INTERESTS

- Tissue engineering, Stem cell engineering, Organoids, Gene editing, Disease modeling, Drug testing,
- Deep learning, Single cell sequencing, Imaging processing

PUBLICATIONS

- **He S**, Xu, C, Chauhan S, Lao YH, Xiao Y, Willner M, McElroy S, Tomer R, Jin Y, Azizi E, Gogos J, Rao S, Xu B, Leong K. Mapping morphological malformation to genetic dysfunction in blood vessel organoids. In preparation.
- Kim, H.S., Xiao, Y., Chen, X., **He S**, Im, J., Willner, M.J., Finlayson, M.O., Xu, C., Zhu, H., Choi, S.J. and Mosharov, E.V., 2021. Chronic opioid treatment arrests neurodevelopment and alters synaptic activity in human midbrain organoids. bioRxiv.
- G Zhong, J Wang, **He S** and X Fu. (2021) Towards better understanding of developmental disorders from integration of spatial single-cell transcriptomics and epigenomics. ICML Workshop in Computational Biology 2021.
- R. Kunes, **He S**, Y. Xiao, S. Tavare, D. Knowles. (2020) Supervised Tumor Cell Subtype Identification via SCAN. ICML Workshop in Computational Biology 2020.
- Lee J. H., Chen Z., **He S**, Zhou J., Tsai A., Truskey G., & Leong K. W. Emulating Early Atherosclerosis in a Vascular Microphysiological System Using Branched Tissue-Engineered Blood Vessels. Advanced Biology, 2000428.
- Heuler J, **He S**, Ambardar S, Voronine DV. Point-of-care detection, characterization, and removal of chocolate bloom using a handheld Raman spectrometer. Scientific reports. 2020 Jun 17;10(1):1-0.
- Mintz RL, Lao YH, Chi CW, **He S**, Li M, Quek CH, Shao D, Chen B, Han J, Wang S, Leong KW. CRISPR/Cas9-mediated mutagenesis to validate the synergy between PARP1 inhibition and chemotherapy in BRCA1-mutated breast cancer cells. Bioengineering & translational medicine. 2020 Jan;5(1):e10152.
- **He S**, Li H, Gomes CL, Voronine DV. Tip-enhanced Raman scattering of DNA aptamers for Listeria monocytogenes. Biointerphases. 2018 Jun 3;13(3):03C402.
- Yoon J, Beers TC, Placco VM, Rasmussen KC, Carollo D, **He S**, Hansen TT, Roederer IU, Zeanah J. VizieR Online Data Catalog: Carbon-enhanced metal-poor (CEMP) star abundances (Yoon+, 2016). VizieR Online Data Catalog. 2017 Mar;183.
- Li H, Zhao S, Xia M, **He S**, Yang Q, Yan Y, Zhao H. Spontaneous formation of non-uniform double helices for elastic rods under torsion. Physics Letters A. 2017 Feb 19;381(7):689-700.
- Yoon J, Beers TC, Placco VM, Rasmussen KC, Carollo D, **He S**, Hansen TT, Roederer IU, Zeanah J. Observational Constraints on First-star Nucleosynthesis. I. Evidence for Multiple Progenitors of CEMP-No Stars. The Astrophysical Journal. 2016 Dec 5;833(1):20.

RESEARCH EXPERIENCE

Columbia University Department of Biomedical Engineering NYC, NY
Research Assistant to Professor Kam Leong, Samuel Y. Sheng Professor of Biomedical Engineering & Professor Elham Azizi, Herbert & Florence Irving Assistant Professor of Cancer Data Research Sep. 2018 – Present
Topic: **Deep learning based morphological and transcriptome analysis of tissue engineered organoids**

- Modeling the radiation injury and countermeasure drug efficacy on blood vessel organoids.
- Applying deep-learning techniques to investigate vasculopathy in tissue-engineered vessel organoids derived from patients with genetic disorders.
- Studying the motility and morphological patterns of engineered mesenchymal stem cells spheroids.

- Studying the spatial transcriptome in the midbrain organoids
- Modeling Proteus syndrome by iPSC-derived vascular organoids

Harvard University Department of Molecular and Cellular Biology Cambridge, MA
Research Assistant to Professor Howard Berg, Herchel Smith Professor of Physics Feb. 2017 – Jan. 2018
Topic: **Mechanosensing in the bacterial flagellar motor of E.coli**

Massachusetts Institute of Technology Department of Physics, Physics of Living Systems Cambridge, MA
Research Assistant to Professor Nikta Fakhri Sept. 2016 – Dec. 2016
Topic: **Non-equilibrium physics in living systems**

Texas A& M University TX, USA
Research Assistant to Professor Marlan Scully, Professor at Princeton and TAMU Sep. 2015 – Jan. 2016
Topic: **Investigation of Chocolate Bloom & TERS imaging of aptamers for non-label DNA sequencing**

University of Notre Dame Department of Physics South Bend, IN
REU student, Under supervision of Professor Timothy C. Beers May 2015 – Aug. 2015
Topic: **Bi-modality of Carbon Enhance Metal Poor Stars**

Academic Activities

- Mentor at Bioforce program July. 2021 - Aug. 2021
- ENVISION, Women in STEM, Judging Dec. 2020 - Jan. 2021
- Columbia University
  Teaching Assistant on BMEN 4530 DRUG AND GENE DELIVERY NYC, NY, Sep. 2019 – Dec. 2019
- Presentation, Fall 2015 Joint Meeting of the Texas Section of the AAPT, Texas Section of the APS and Zone13 of the Society of Physics Students Oct. 2015. Waco, TX
- XJTU Representative at China Undergraduate Physics Tournament
  Awarded Second Prize Aug. 2016 Wuhan, China
- Honor Science Program (Physics) participant
  Selected on basis of outstanding performance in physics 2013-2018, Xian, China

Other Activities

- Member of council in XJTU Alumni Association of Greater New York Nov. 2020 - Present
- Scientific American, Intern Apr. 2017 - Dec. 2017
- Volunteer,35th Council Meeting of Association of Asia Pacific Physical Societies Apr. 2017
- Compere of graduation ceremony of College of Tsien Hsue-shen June 2017
- Public Activities Organizer for Bulletin Board System of XJTU May 2017-June 2017

Selected Honors and Awards

- Sigma Xi Grants-in-Aid of Research Award 2021
- First Prize in Mount Everest Scholarship (One of six students awarded, Xian Jiaotong University) 2015,2016
- Siyuan Scholarship, Xian Jiaotong University 2014, 2015,2016
- Dean' s List Award, Xian Jiaotong University 2014
- Second Prize,China Undergraduate Physics Tournament (Chinese Physical Society) 2014

Research Skills

- **Experimental Skills**: cell culture, stem cell engineering, gene editing, tissue engineering, lentiviral transduction, confocal microscope, single-cell analysis, AFM-Raman joint system (for TERS), AFM, confocal Raman spectroscope, DNA origami; bacteria culture, microfluidics.
- **Programming and Software**: Pytorch, Tensorflow, Pyro, paraView, Openfoam, Comsol, Matlab, C++, C, LaTeX, Origin, Python, R

Attended Conference

- **iCML2020**
- **iCML2021**
- **BMES2021**

Internship

- **Data Scientist@Roche**: emerging technologies in cell rna sequencing