



## Zhonglin Lyu

Instructor, Neurosurgery

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#### BIO

Dr. Lyu is an instructor at the Department of Neurosurgery, Stanford University School of Medicine. He obtained his PhD at Soochow University, China, where he gained training in designing biomaterials to modulate stem cell behaviors and led multidisciplinary research under the advice of Prof. Hong Chen. During his PhD, he worked as a visiting student researcher at Canary Center for Early Cancer Detection at Stanford University School of Medicine where he gained training in microfluidics and cancer metastasis. Dr. Lyu carried out his postdoctoral research under the guidance of Prof. Jon Park and Wonjae Lee at the Department of Neurosurgery, Stanford University School of Medicine. He developed an in vitro microphysiological model of ischaemic stroke and used it as a platform to systematically evaluate the restorative potential of stem cell therapy.

As an instructor, Dr. Lyu's main research interest is to develop in vitro tissue/organ models to mimic human diseases including neurological diseases and cancer metastases. The goal is to use these models to understand disease mechanisms, to evaluate the safety and efficacy of existing drugs, and to look for new therapeutic targets.

#### ACADEMIC APPOINTMENTS

- Instructor, Neurosurgery

#### PROFESSIONAL EDUCATION

- Doctor of Philosophy, Soochow University , Biomedical Engineering (2017)

### Publications

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#### PUBLICATIONS

- **Interactions of Biomaterial Surfaces with Proteins and Cells** *Interactions of Biomaterial Surfaces with Proteins and Cells*  
Lyu, Z., Zou, Y., Yu, Q., Chen, H.  
Springer Nature.2023: 199-225
- **A neurovascular-unit-on-a-chip for the evaluation of the restorative potential of stem cell therapies for ischaemic stroke.** *Nature biomedical engineering*  
Lyu, Z., Park, J., Kim, K., Jin, H., Wu, H., Rajadas, J., Kim, D., Steinberg, G. K., Lee, W.  
2021
- **A versatile system to record cell-cell interactions.** *eLife*  
Tang, R., Murray, C. W., Linde, I. L., Kramer, N. J., Lyu, Z., Tsai, M. K., Chen, L. C., Cai, H., Gitler, A. D., Engleman, E., Lee, W., Winslow, M. M.  
2020; 9
- **Epithelial-to-Mesenchymal Transition (EMT) and Drug Response in Dynamic Bioengineered Lung Cancer Microenvironment** *ADVANCED BIOSYSTEMS*  
Mani, V., Lyu, Z., Kumar, V., Ercal, B., Chen, H., Malhotra, S., Demirci, U.

2019; 3 (1)

- **Sulfonate Groups and Saccharides as Essential Structural Elements in Heparin-Mimicking Polymers Used as Surface Modifiers: Optimization of Relative Contents for Antithrombogenic Properties** *ACS APPLIED MATERIALS & INTERFACES*  
Chen, X., Gu, H., Lyu, Z., Liu, X., Wang, L., Chen, H., Brash, J. L.  
2018; 10 (1): 1440–49
- **Deciphering the Role of Sulfonated Unit in Heparin-Mimicking Polymer to Promote Neural Differentiation of Embryonic Stem Cells** *ACS APPLIED MATERIALS & INTERFACES*  
Lei, J., Yuan, Y., Lyu, Z., Wang, M., Liu, Q., Wang, H., Yuan, L., Chen, H.  
2017; 9 (34): 28209–21
- **Intracellular Delivery Platform for "Recalcitrant" Cells: When Polymeric Carrier Marries Photoporation** *ACS APPLIED MATERIALS & INTERFACES*  
Wu, J., Xue, H., Lyu, Z., Li, Z., Qu, Y., Xu, Y., Wang, L., Yu, Q., Chen, H.  
2017; 9 (26): 21593–98
- **Synthetic Glycopolymers for Highly Efficient Differentiation of Embryonic Stem Cells into Neurons: Lipo- or Not?** *ACS APPLIED MATERIALS & INTERFACES*  
Liu, Q., Lyu, Z., Yu, Y., Zhao, Z., Hu, S., Yuan, L., Chen, G., Chen, H.  
2017; 9 (13): 11518–27
- **Promoting neural differentiation of embryonic stem cells using beta-cyclodextrin sulfonate** *JOURNAL OF MATERIALS CHEMISTRY B*  
Lyu, Z., Shi, X., Lei, J., Yuan, Y., Yuan, L., Yu, Q., Chen, H.  
2017; 5 (10): 1896–1900
- **A hemocompatible polyurethane surface having dual fibrinolytic and nitric oxide generating functions** *JOURNAL OF MATERIALS CHEMISTRY B*  
Gu, H., Chen, X., Liu, X., Zhan, W., Lyu, Z., Yu, Q., Wu, Z., Chen, H.  
2017; 5 (5): 980–87
- **Glycosaminoglycans (GAGs) and GAG mimetics regulate the behavior of stem cell differentiation** *COLLOIDS AND SURFACES B-BIOINTERFACES*  
Wang, M., Liu, X., Lyu, Z., Gu, H., Li, D., Chen, H.  
2017; 150: 175–82
- **A Universal Platform for Macromolecular Delivery into Cells Using Gold Nanoparticle Layers via the Photoporation Effect** *ADVANCED FUNCTIONAL MATERIALS*  
Lyu, Z., Zhou, F., Liu, Q., Xue, H., Yu, Q., Chen, H.  
2016; 26 (32): 5787–95
- **Bioinspired Blood Compatible Surface Having Combined Fibrinolytic and Vascular Endothelium-Like Properties via a Sequential Coimmobilization Strategy** *ADVANCED FUNCTIONAL MATERIALS*  
Zhan, W., Shi, X., Yu, Q., Lyu, Z., Cao, L., Du, H., Liu, Q., Wang, X., Chen, G., Li, D., Brash, J. L., Chen, H.  
2015; 25 (32): 5206–13
- **A theranostic prodrug delivery system based on Pt(IV) conjugated nano-graphene oxide with synergistic effect to enhance the therapeutic efficacy of Pt drug** *BIOMATERIALS*  
Li, J., Lyv, Z., Li, Y., Liu, H., Wang, J., Zhan, W., Chen, H., Chen, H., Li, X.  
2015; 51: 12–21
- **Efficient cancer cell capturing SiNWAs prepared via surface-initiated SET-LRP and click chemistry** *POLYMER CHEMISTRY*  
Xue, L., Lyu, Z., Luan, Y., Xiong, X., Pan, J., Chen, G., Chen, H.  
2015; 6 (19): 3708–15
- **A new avenue to the synthesis of GAG-mimicking polymers highly promoting neural differentiation of embryonic stem cells** *CHEMICAL COMMUNICATIONS*  
Wang, M., Lyu, Z., Chen, G., Wang, H., Yuan, Y., Ding, K., Yu, Q., Yuan, L., Chen, H.  
2015; 51 (84): 15434–37
- **6-O-Sulfated Chitosan Promoting the Neural Differentiation of Mouse Embryonic Stem Cells** *ACS APPLIED MATERIALS & INTERFACES*  
Ding, K., Wang, Y., Wang, H., Yuan, L., Tan, M., Shi, X., Lyu, Z., Liu, Y., Chen, H.

2014; 6 (22): 20043–50

- **Stimulation of Gene Transfection by Silicon Nanowire Arrays Modified with Polyethylenimine** *ACS APPLIED MATERIALS & INTERFACES*

Pan, J., Lyu, Z., Jiang, W., Wang, H., Liu, Q., Tan, M., Yuan, L., Chen, H.

2014; 6 (16): 14391–98

- **Maintaining the pluripotency of mouse embryonic stem cells on gold nanoparticle layers with nanoscale but not microscale surface roughness** *NANOSCALE*

Lyu, Z., Wang, H., Wang, Y., Ding, K., Liu, H., Yuan, L., Shi, X., Wang, M., Wang, Y., Chen, H.

2014; 6 (12): 6959–69

- **Fast and green synthesis of smart glyco-surface via aqueous single electron transfer-living radical polymerization** *Macromolecular Chemistry Physics*

Xue, L., Lyu, Z., Shi, X., Tang, Z., Chen, G., Chen, H.

2014: 1491-1497

- **Enzyme-triggered supramolecular self-assembly of platinum prodrug with enhanced tumor-selective accumulation and reduced systemic toxicity** *JOURNAL OF MATERIALS CHEMISTRY B*

Liu, H., Li, Y., Lyu, Z., Wan, Y., Li, X., Chen, H., Chen, H., Li, X.

2014; 2 (47): 8303–9

- **Incorporation of tyrosine phosphate into tetraphenylethylene affords an amphiphilic molecule for alkaline phosphatase detection, hydrogelation and calcium mineralization** *JOURNAL OF MATERIALS CHEMISTRY B*

Liu, H., Lv, Z., Ding, K., Liu, X., Yuan, L., Chen, H., Li, X.

2013; 1 (41): 5550–56