Menglin Wang

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EDUCATION

BE in New Energy Materials and Devices **Sept. 2016- June. 2020**
Department of Chemistry &Chemical Engineering, Anhui University, Hefei, China
GPA: 87.3/100
Rank: 1/45 (Only the first three academic years were counted)

Core courses:

Inorganic and Analytical Chemistry (90)	College Physics (99)	Theoretical Electrochemistry (90)
Fundamental of Materials Engineering (93)	Materials Mechanics (94)	Electrochemical Measurement (92)

IETLS: Listening: 8, Reading: 9, Speaking: 6, Writing: 6, Overall: 7.5
GRE: Quantitative Reasoning: 153, Verbal Reasoning: 167, Analytical Writing: 3

PROJECT EXPERIENCE

Research Assistant at Intelligent Micro/nano Manufacturing Laboratory in Westlake University

July.2019 - Present

Project name: 3D printed micro pillar array for high throughput drug screening

July.2020 - present

Research Overview:

Currently, biomedical field has been seeking a feasible standard drug screening system for drug researching due to providing sufficient samples and simulating actual *in vivo* tumor growth situation, which is still a challenge to rapidly and uniformly establish though. We tried to fabricate micro pillar arrays (MPAs) by 3D printing and possibly improve the conventional screening method and realize the high throughput drug screening.

Participation:

- **mainly charged by myself**
- Design and fabricate micro pillar arrays (MPAs) for 3D printing drug screening.
- Seed cells on MPAs and monitor cells fate.
- Investigate how the pattern size and geometry affect drug response.
- High throughput screen anticancer drugs and investigate how the different drug concentration affect the fate of cell line 231 and compare the results to 96 well plate.

Project name: Inducing highly physiologically relevant phenotypes of human vascular smooth muscle cells via 3D printing **Aug.2019 - May.2020**

Research Overview:

We utilized various 3D printing technologies to investigate how do the physical cues of microenvironment modulate cellular phenotypes through creating complex ECMs. We first investigated the how do the human vascular smooth muscle cells (VSMCs) response when culturing on the 3D printed microfilaments and stencils from the perspective of area, curvature and aspect ratio of the matrix. We next collectively aligned the VSMCs by printing closed microfilaments. To Induce highly physiologically relevant phenotypes of VSMCs, we designed an integrated high throughput printhead, which can extrude the vessel wall and microfilaments simultaneously. We validated that the smooth muscle cells cultured on the printed vessel presents a more physiologically relevant phenotype and much more active when responses to an ischemia environment than conventional planar culturing of VSMCs.

Achievement:

Peiran Zhu; Xuzhao Li; Wang Xin; **Menglin Wang**; Chengzhen Yin; Jinze Li; Hangyu Chen; Hengjia Zhu; Qilin Qian; Yubing Sun; Jiemin Jia; Nanjia Zhou. ***Inducing highly physiologically relevant phenotypes of human vascular smooth muscle cells via 3D printing*** (***published by Bioxiv, DOI: 10.1101/2020.07.24.206888***)

Project name: Heavy Metal Exposure Leads to Rapid Changes in Cellular Biophysical Properties

July.2019 - Oct.2019

Research Overview:

We investigated how the chemical cues affect biophysical properties of cells, such as cell mechanics, cell shape, and cell migration. we found the characteristic changes in cell biophysical properties exposed to lead and cadmium. We measured the traction force, focal adhesions, migration speed, and stiffness for single cells under varying concentrations of lead (II) nitrate. Next, we investigated the effect of lead on the biophysical properties of a cell monolayer, where the monolayer permeability and wound healing speed were measured. Our results demonstrate changes in various biophysical properties attributed to even very low (10μM) concentrations of lead. We further demonstrate that another heavy metal, cadmium, could also lead to cellular biophysical properties changes but in a different manner compared to lead.

Achievement:

Peiran Zhu, Jamar Hawkins, Will Hamilton Linthicum, **Menglin Wang**, Ningwei Li, Nanjia Zhou, Qi Wen, Alicia Timme-Laragy, Xiaofei Song, Yubing Sun. ***Heavy Metal Exposure Leads to Rapid Changes in Cellular Biophysical Properties***. ***ACS Biomaterials Science& Engineering (DOI: 10.1021/acsbiomaterials.9b01640).***

Research Assistant at Microstructure Laboratory in University of Science and Technology of China

Project name: Synthesis of a Double-network Hydrogel with for 3D Printing **Feb.2018 - Apr.2019**

Research Overview:

To obtain a high modulus and self-healing hydrogel, gelatin/PAAm hydrogel system was selected. PAAm was chose for its commonality as a second soft and tough network, while gelatin was selected mainly for its good biocompatibility and low (26~30°C) thermal reversible sol-gel transition, which could ensure a good self-healing function at room temperature. k-carrageenan is added to improve the rheological properties of the hydrogel.

Participation:

- Synthesize a double network hydrogel (PAAm/gelatin) with high modulus and high fracture stress
- Adjust the viscosity of the hydrogel to make them suitable for 3D printing.
- Print the hydrogel through Direct Ink Writing.

HONORS & AWARDS (SELECTED)

- Excellent undergraduate **Dec.2020**
- Excellent League Member **May.2018**
- Hengxin Scholarship **Dec.2017**
- Three-virtues Student of the university **Dec.2017**
- **As a leader, 5th/80 teams, The fourth "Kaitai capital" alumni cup business innovation competition** **Jun.2017**
- **Tai chi performance, Celebrating Anhui University 88th Anniversary** **Oct.2016**

PUBLIC SERVICES

The Ninth National Pearl University Student Public Welfare Summer Camp **July.2017**

- Went to the middle schools in remote areas of Yunnan and Guizhou to conduct study guidance, social skills training, and cooperation ability training for high school students there

Practice of the innovation policy practice of the Yeji District Government to promot economic development and environmental protection **June.2017**

- Investigated grassroots public opinion and people's living conditions, and sorted out the collected data
- Sought appropriate solutions to the problem based on the actual situation in the local area

OTHER ACHIEVEMENTS

A preparation method and application of a biochip based on 3D printing photosensitive resin. Patent, CN201911018455

- Inventors: Zhu, Peiran; Zhou, Nanjia; **Wang, Menglin**; Chen, Hangyu; Sun, Kailu

A biomimetic method for manufacturing vascular smooth muscle layer. Patent, submitted

- Participation: the work of patent writing

Create vasculature in engineered tissues and organs. Peiran Zhu, Hengjia Zhu, **Menglin Wang**, Nanjia Zhou ***Review, under preparation***