ZHANG SHUHAO

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A. RESEARCH EXPERIENCE

A1. **Whole-cell scale dynamic control of lysosomes and endosomes by endoplasmic reticulum** Major participant
Supervisor: Dr. Ge Yang, Chinese Academy of Sciences Mar. 2019 - Now

Description: *In eukaryotic cells, it is believed that the cytoskeleton takes charge of organelles' trafficking. Previous studies show that the endoplasmic reticulum is also involved in whole-cell scale organization of lysosomes and endosomes,. So here in this study we aim at holisticly investigating what role the ER plays in the organization of lysosomes and endosomes, providing insights into how organelle interactions are mediated and regulated across the entire intracellular space.*

Contents:

- Trained U-net for automated ER segmentation.
- Constructed ER-related gene mutations, investigating their effects on ER morphology and organelles trafficking.
- Employed Western Blot to test the expression of putative pathway-relative proteins in mutated cells.

A2. **Eliglustat prevents osteoclast formation in multiple myeloma by preventing TRAF3 degradation** Co-author
Supervisor: Dr. Nicole Horwood, University of Oxford Aug. 2018 - Feb. 2019

Description: *According to previous studies, a newly approved drug for treating Gaucher Disease manifests an ability to decrease multiple myeloma prevalence in clinical practice. In this study, we tested its effect on mice with multiple myeloma utilizing various approaches and hypothesized possible mechanisms behind the curing process.*

Contents:

- Analyzed bone condition of drug-treated mice using micro-CT and Analyze12.0 software.
- Employed Western Blot and real-time qPCR to test the activity of multiple autophagy marker molecules.
- Employed FACS to test tumor burden in bone marrow and spleen of mice treated with Eliglustat.

A3. **Supra-molecular nanofibers with superior bioactivity to IGF-1** Co-author
Supervisor: Dr. Zhimou Yang, **State Key Laboratory** of Bioactive Materials Apr. 2017 - Apr. 2018

Description: *Protein-mimicking peptide has always aroused interests of scientists due to its economicality. In our study, we designed a peptide sequence which consists of the active site of IGF-1 and assembling factor, in expectation of its being able to possess same bioactivity as IGF-1 protein including in vitro and in vivo tests on various aspects.*

Contents:

- Employed Western Blot to test the activity of signaling molecules in downstream pathways of IGF-1.
- Tested anti-apoptosis and proliferation-activating function using live-dead assay and MTT, respectively.
- *In vivo* test on its ability to cure lower limb ischemia.

B. SKILLS

B1. **Chemistry**: Solid-phase Peptide Synthesis, HPLC Purification, LC-MS Analysis, Circular Dichroism analysis.

B2. **Biology**: Western Blot, qPCR, ELISA, Micro-CT, Bone condition analysis, Flow Cytometry, Confocal microscopy, Molecular cloning, Transfection.

B3. **Programming**: Latex, Matlab, Deep learning.

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C. PUBLICATIONS

C1. Li W; Zhang S; Yang G*. **Intracellular organelle networks: an emerging paradigm in internal organization of eukaryotic cells** *(In Review, WIRES Systems Biology and Medicine*)

C2. Leng H; Zhang S;...; Horwood N*. **Eliglustat prevents osteoclast formation in multiple myeloma by preventing TRAF3 degradation** *(In Review, American Society of Hematology Annual Meeting)*

C3. Shang Y; Zhi D;...; Zhang S;...; Gao J*; Yang Z*. **Supra-molecular nanofibers with superior bioactivity to Insulin-like growth factor-1** *(NanoLetters* DOI: 10.1021/acs.nanolett.8b04406)

C4. Shang Y;...; Zhang S; Gao J*; Li X*; Yang Z*. **A novel thermogel system of self-assembling peptides manipulated by enzymatic dephosphorylation** (*Chemical Com*munications DOI:10.1039/C9CC00401G)

D. EDUCATION

D1. **B.S.** in Nankai University

Sep. 2015 - Jul. 2020 (expected)
Major: Biological Sciences
Minor: Applied Mathematics
Overall GPA: 3.8/4.0 (ranking 2/55)
TOEFL: 103
GRE: 170(Q) + 155(V) + 3.0(AW)

D2. **University and Professional Studies Program** in UC San Diego

Sep. 2017 - Jan. 2018
Overall GPA: 3.9/4.0
Courses: Recombinant DNA Techniques (A), Genetics (A), Microbiology (A), etc.

E. FUNDING

E1. The National University Student Innovation Program (~US$5,000)
Program: Mechanism of HCPT-peptide-Pt Accumulation in Cell Nucleus.
E2. Student Award Program by College of Life Sciences (~US$13,000)
Program: University and Professional Studies in University of California, San Diego.
E3. Student Award Program by College of Life Sciences (~US$11,000)
Program: Research Assistant Funding in University of Oxford.

F. AWARDS

2017~2018 Nankai Scholarship for Academic Excellence
2017~2018 Nankai Outstanding Student
2017~2018 Excellent Student Officer in Admission Office of Nankai University
2016~2017 Nankai Scholarship for Academic Excellence
2016~2017 Nankai Outstanding Student
2016~2017 Second Prize in National Undergraduate English Competition
2016~2017 First Prize in National Undergraduate Mathematics Competition
2016~2017 Excellent Student Officer in Student Union of Nankai University
2016~2017 Excellent Student Officer in the Federation of Student Society of Nankai University

G. REFERENCES

G1. Ge Yang | Professor | School of Artificial Intelligence | University of Chinese Academy of Science | ge.yang@ia.ac.cn
G2. Nicole Horwood | Professor | Norwich Medical School | University of East Anglia | n.horwood@uea.ac.uk
G3. Zhimou Yang | Professor | College of Life Sciences | Nankai University | yangzm@nankai.edu.cn