

# Qiuyang Wang

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## EDUCATION

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**M.S. in Applied Math**      **Columbia University in the city of New York, U.S.**      2021.9-2023.5

· **Math:** Modern Algebra I, Modern Analysis I, Numerical Algebra and Optimization, PDEs

**B.S. in Chemistry (Honors Degree)**      **Wuhan University, China (GPA 3.81/4.0)**      2017.9-2021.6

· **Math:** Theory of ODEs, Functions of Complex Variables, Statistics, Probability Theory, Calculus, Linear Algebra

· **Computer Science:** Data Structure, Machine Learning, C Programming

· **Chemistry and Biology:** Neurobiology, Physical Chemistry, Organic Chemistry, Analytical Chemistry, Molecular Modeling

Visiting Student in Columbia College      **Columbia University in the city of New York, U.S.**      2020.1-2020.5

· **Math:** Theoretical Neuroscience, Numerical Math, Theory of PDEs, Analysis and Optimization

## RESEARCH EXPERIENCE

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**Coarse-graining method for IF network and Dynamics in spatially ordered SNN**      2020.9-2021.5

Advisor: Jiwei Zhang      (School of Math and Statistics, Wuhan University)

Research Assistant

Duties included:

- Mechanically studied a new coarse-graining framework for integrate-and-fire (IF) network to reduce the dimensionality.
- Rebuilt and improved a spatially ordered spiking neural network (SNN) model that matches the experimental result about neural variability.
- Modelled the CaMKII pathway in neurons to show its on/off property in Long-Term Potentiation(LTP).

**Place cells generation via auto-encoder model with a strong history effect**      2020.5- 2020.9

Advisor: Stefano Fusi      (Centre of Theoretical Neuroscience, Columbia University)

Research Assistant

Duties included:

- Simulated the memory performance of a Hopfield network with cascade synapses model to solve the *catastrophic forgetting* problem.
- Built an auto-encoder model which can naturally generate place cells in hippocampus, and implemented the cascade synapses model above to strengthen the history effect.

**A novel antimicrobial treatment and a non-systematic drug delivery method**      2018.6 - 2019.6

Advisor: Xianzheng Zhang      (College of Chemistry and Molecular Science, Wuhan University)

Research Assistant

Duties included:

- Developed a novel anti-bacterial method combining photodynamic therapy and chimeric peptides.
- Tested the idea about non-systematic drug delivery strategy to central neural system through axoplasmic transport.

## PUBLICATIONS

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1. Ai-Nv Zhang<sup>†</sup>, Wei Wu<sup>†</sup>, Chi Zhang, **Qiu-yang Wang**, Ze-Nan Zhuang, Han Cheng, and Xian-Zheng Zhang\* *A Versatile Bacterial Membrane-Binding Chimeric Peptide with Enhanced Photodynamic Antimicrobial Activity* **2019** Journal of Materials Chemistry B, 7, 1087-1095.

## SKILLS

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Programming: python (most proficient), MATLAB, C, L<sup>A</sup>T<sub>E</sub>X

Statistics: pandas(python), R

Research Tools: Spiking Neural Network, pytorch, Machine Learning

Experimental skills: Material Synthesis, Tumor Transplantation, Confocal Laser-Scanning Microscopy, Fluorescence Imaging

## HONORS

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WHU Outstanding Scholarship for Visiting Student      2020

Honor Scholarship for Hongyi College      2019

Outstanding Student Scholarship (grade 2)      2019

2<sup>nd</sup> Prize for Drama Competition in School of Sciences      2018