

# Haihuan Wang

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## EDUCATION

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University of Pennsylvania, Material Science & Engineering SEP 2018 - MAY 2020  
Master of Science in Engineering

Sichuan University, College of Polymer Science and Engineering SEP 2014 - JUL 2018  
Bachelor of Engineering in Polymer Materials and Engineering

## RESEARCH EXPERIENCE

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- **Hygroscopic salt induced hydrogel kirigami building envelopes**

Advisors: *Profs. Shu Yang and William W. Braham*

MAY 2019 - MAR 2020

Synthesized large area hygroscopic salt induced hydrogel, and in combination with the Kirigami structure to achieve evaporative building cooling effect.

- **Shaping and locomotion of soft robots with embedded liquid crystal elastomer-carbon nanotube composite filaments**

Advisors: *Profs. Shu Yang and Randall D. Kamien*

JUL 2019 - JAN 2020

Fabricated liquid crystal elastomer (LCE) filaments that can undergo light and electrical actuations for soft robotic applications

- **Double network hydrogels for intrinsically self-lubricated condoms**

Advisors: *Profs. Shu Yang and Robert W. Carpick*

DEC 2018 - MAY 2020

Designed and synthesized the tough and self-lubricated double-interpenetrating network hydrogels from polyacrylamide (PAAm) and alginate, using Small Angle X-ray Scattering to test the hydrogel mesh size.

- **Thermo-responsive three-stage optical modulation of a self-healing composite hydrogel**

Advisor: *Profs. Feng Luo*

DEC 2017 - OCT 2018

Designed, synthesized and characterized the self-healing and thermo-responsive composite polyampholyte hydrogel. Responsible for the paper writing.

- **Bio-inspired peptide-decorated tannic acid for surface antibacterial and antifouling coating of dental implant.**

Advisor: *Profs. Jianshu Li*

OCT 2016 - SEP 2017

Synthesized the peptide decorated Tannic acid and characterized its anti-protein and anti-bacteria performance. Did the characterization of CLSM, AFM, SEM, Cytotoxicity assay of MG63 cell in vitro, live/dead assay of *S.mutans* in vitro. Responsible for part of the paper writing

- **Peptide-decorated teeth drug load with  $\beta$ -cyclodextrin**

Advisor: *Profs. Jianshu Li*

NOV 2016 - DEC 2017

Decorated the  $\beta$ -cyclodextrin with a peptide sequence that has binding ability to hydroxyapatite, then incorporated the anti-bacteria drug into the  $\beta$ -cyclodextrin and characterized the antibacterial performance with confocal laser scanning microscope (CLSM), Fluorescence absorbance analysis.

- Structure and properties of tough polyampholyte hydrogels: effects of a methyl group in the cationic monomer

Advisor: Profs. Feng Luo

NOV 2015 - SEP 2016

Synthesized and characterized the mechanical property of tough polyampholyte hydrogels. Part of the paper writing.

## **PUBLICATION**

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- Liu, J.†, Gao, Y.†, **Wang, H.**, Poling-Skutvik, R., Osuji, C., Yang, S., Shaping and Locomotion of Soft Robots with Embedded Liquid Crystal Elastomer-Carbon Nanotube Composite Filaments. *Advanced Intelligent Systems*.
- **Wang, H.**, Zhan, J., Xiao, K., Luo, F., Li, J., & Tan, H. (2018). Thermoresponsive Three-Stage Optical Modulation of a Self-Healing Composite Hydrogel. *Macromolecular Chemistry and Physics*, 219(23), 1800329.
- Yang, X. †, Huang, P. †, **Wang, H.** †, Cai, S., Liao, Y., Mo, Z., ... & Li, J. (2017). Antibacterial and anti-biofouling coating on hydroxyapatite surface based on peptide-modified tannic acid. *Colloids and Surfaces B: Biointerfaces*, 160, 136-143.(† equal contribution)
- Wang, L., **Wang, H.**, Yu, H., Luo, F., Li, J., & Tan, H. (2016). Structure and properties of tough polyampholyte hydrogels: Effects of a methyl group in the cationic monomer. *Rsc Advances*, 6(115), 114532-114540.

## **PRESENTATION AND EXTRACURRICULAR ACTIVITY**

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Society of Tribologists and Lubrication Engineers, Philadelphia Poster Presentation	JAN2020
4th Annual University of Pennsylvania Polymer Symposium	MAY2019
Center for AIDS Research Symposium	MAY2019
Assistant to Counselor, Grade 2014 of College of Polymer Science and Engineering	NOV2016 - JUN2018
Deputy Secretary, SU of College of Polymer Science and Engineering of Sichuan University	OCT2015 - JUN2018
Volunteer, the 7 <sup>th</sup> CCS-PD/ACS-PMSE Joint Symposium on Frontiers in Polymer Science and Engineer	OCT2017

## **HONORS AND AWARDS**

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<b>Outstanding Research Award</b> , University of Pennsylvania	2020
<b>Best Poster</b> , 4th Annual Penn Polymer Symposium, University of Pennsylvania	2019
<b>STLE Scholarship</b> , Society of Tribologists and Lubrication Engineers, Philadelphia	2019
<b>Master Scholar Award</b> for Research Excellence by MSE department, University of Pennsylvania	2018
<b>National Scholarship</b> for Academic Excellence (top 1%) - National Level	2017
<b>Excellent Student</b> awarded by Sichuan Provincial Bureau of Education (top 1%) - Regional Level	2017
<b>Excellent Student</b> awarded by Sichuan University – School Level	2017
<b>Outstanding Student Leader</b> awarded by Sichuan University	2017
<b>First Prize</b> in the Innovation Entrepreneurship Competition of Sichuan University	2017
<b>Outstanding Student Leader</b> awarded by Sichuan University	2016