Pierre Kawak

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Education

Brigham Young University (BYU) *Full Scholarship* Thesis: Simulation of Crystal Nucleation in a Polymer Melt	Ph.D, Chemical Engineering *Advisor: Douglas R. Tree*	2017 – Apr 2022
American University of Sharjah (AUS) *Full Scholarship; Only Graduate with 4.0 CGPA* Thesis: Ultrasound Triggered Release of Estrone- Targeted Liposomes	M.S. Chemical Engineering *Advisor: Ghaleb A. Husseini*	2015 – 2017
American University of Sharjah (AUS) *Partial Scholarship*	B.S. Chemical Engineering Minor Economics	2010 – 2015

Biography

I did my MS thesis work with Ghaleb A. Husseini in the Chemical Engineering department at the American University of Sharjah in the UAE, where I developed a nanoparticle carrier of the chemotherapeutic drug doxorubicin using dry film hydration, centrifugation, extrusion, membrane filtration and other lab methods. This smart drug delivery system was ultrasound sensitive with a functionalized surface with polyethylene glycol and estrone receptors optimized for targeted release at breast cancer sites. I studied the efficacy of the carrier and its release using Dynamic Light Scattering, an ultrasonic probe and a spectrofluorometer. I am currently completing my PhD thesis at the Brigham Young University with Douglas R. Tree, where I simulate coarse-grained bead-spring models to better understand nucleation in a dense polymer melt. My goal is to assess the range of applicability of classical nucleation theories to the problem of polymer crystallization using various molecular simulation methods employing advanced movesets and monte carlo methods. Going forward, I am interested in combining my knowledge in experimental and computational methods to attack a biomedical engineering problem.

Publications

[3] Najla M. Salkho, Vinod Paul, Pierre Kawak, Rute F. Vitor, Ana M. Martins, Mohammad Al Sayah, and Ghaleb A. Husseini. "Ultrasonically controlled estrone-modified liposomes for estrogen-positive breast cancer therapy". *Artificial Cells, Nanomedicine, and Biotechnology* 46 (2018), pp. 462–472.

[2] Pierre Kawak. "Ultrasound Triggered Release of Estrone- Targeted Liposomes". *American University of Sharjah Theses & Dissertations: Masters Theses* (2017).

[1] Pierre Kawak, Dakota S. Banks, and Douglas R. Tree. "Semiflexible Oligomers Crystallize via a Cooperative Phase Transition". *Journal of Chemical Physics* (in press).

Presentations

[7] Pierre Kawak et al. "Free Energy Analysis of Polymer Crystal Nucleation Indicates Cooperative Crystallization and Nematic Alignment". APS March Meeting. American Physical Society. Chicago, IL, 2022.

[6] Pierre Kawak et al. "Free Energy Surfaces for Homogeneous Nucleation in a Polymer Melt". AIChE Annual Meeting. American Institute of Chemical Engineers. Boston, MA, 2021.

[5] Pierre Kawak et al. "GPU-accelerated Wang-Landau Simulation of Polymer Crystallization". APS March Meeting. American Physical Society. Virtual, 2021.

[4] Pierre Kawak et al. "Investigating Primary Nucleation in Polymer Melts using GPU-Accelerated Wang-Landau Simulations". AIChE Annual Meeting. American Institute of Chemical Engineers. Virtual, 2020.

[3] Pierre Kawak et al. "Wang-Landau Simulation of the Free Energy Surface of Crystallization in a Polymer Melt". APS March Meeting. American Physical Society. Virtual, 2020.

[2] Pierre Kawak et al. "Doxorubicin-Encapsulated, Estrone-Appended Liposomes Triggered by Ultrasound for the Treatment of Breast Cancer". Graduate Students Research Conference. UAE Ministry of Education. Khalifa University, Abu Dhabi, UAE, 2017.

[1] Pierre Kawak et al. "A Peptide-Targeted Nanodelivery System Triggered by Ultrasound for Anticancer Therapy". Life Sciences Grand Challenges Conference. Institute of Engineering and Electronics Engineering. Khalifa University, Abu Dhabi, UAE, 2016.

Teaching Experience

Graduate Teaching Assistant *Brigham Young University*	Separations Engineering Process Dynamics & Control Heat & Mass Transfer	Fall 2021 Fall 2018 Spring 2018
Volunteer Course Instructor; *University of the People*	College Algebra	Spring 2018
Graduate Instructor; *American University of Sharjah*	Principles of ChemE	2016 – 2017 (3x)
Graduate Teaching Assistant *American University of Sharjah*	Corrosion Lab ChemE Lab I Desalination (Grad.) Wastewater Treatment	2016 – 2017 (2x) 2015 – 2016 (2x) Spring 2015 Spring 2015
Undergraduate Teaching Assistant *American University of Sharjah*	Mass Transfer Kinetics Thermodynamics	2014 – 2015 (3x) Fall 2014 Spring 2014
Private Tutor	Maths, Engineering, Business, etc.	2010 – present

Memberships and Relevant Academic Activities

Certified Reviewer for American Chemical Society Journals	Fall 2021
Member of Delta Alpha Pi (DAPi) International Honor Society	2021 – present
Member of Out in Science, Technology, Engineering, and Mathematics (oSTEM), Inc.	2021 – present
Attendance of the oSTEM Professional Development Summit	Fall 2021
Member of the American Institute of Chemical Engineers (AIChE)	2020 – present
Assistance in four peer-reviews of articles in the journal Macromolecules	2019 – present
Cofounder and president of BYU ChemE Graduate Student Council	2018 – present
Member of the American Physical Society (APS)	2018 – present
Attendance of the UCSD SDSC High Performance Computing Summer Institute	Summer 2018
Member of the Institute of Electrical and Electronics Engineering (IEEE)	2016 – 2017
Research coordinator at AUS IEEE Engineering in Medicine and Biology Society chapter	2016 – 2017
AUS Biomedical Engineering Symposium **Best Overall Talk Award**	Fall 2016
National Council of Examiners for Engineering and Surveying **Engineer in Training**	2014 – Present
Member of the Society of Petroleum Engineers	2014 – 2016
AUS Dean's List for Academic Excellence	3 semesters
Cofounder and Vice President of the AUS Student Economics Club	2012 – 2014

References

Douglas R. Tree +1 (801) 422-5162 tree.doug@byu.edu
Assistant Professor of Chemical Engineering; Brigham Young University *PhD Advisor*

Ghaleb A. Husseini +971 (6) 515-2970 ghusseini@aus.edu
Professor of Chemical Engineering; American University of Sharjah *MS Advisor*

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