

Minh Tri Ho Thanh

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linkedin.com/in/htmtri92

Work: 323-304-4063

Projects:

Biomedical Design, Microfabrication, and 3D Invasion Assay: SU, 01/2021-present [1-7]

- Studied the effects of vimentin on directing cell migration in 2D and 3D.
- Prepared 3D collagen gels and 3D cancer cell co-cultures for experiment.
- Created micron-sized wells for 3D organoids with microfabrication (PRIMO) and perform laser ablation on embedded organoids in collagen gel in microfluidic chip.
- Computing 3D contractile force applied by invading organoids on collagen (Python).
- Analyzing collagen compactness and network alignment surrounding invading organoids.
- Performed immunofluorescence study of organoids' cytoskeletal organization and collagen fibrous network using two-photon and confocal reflection microscopy.
- Calculating cytoskeletal network alignment correlation of invading cells (MATLAB).

Computational Biophysics, Simulation, and Microbiology: SU, 01/2021-present [8-9]

- Collaborated on a 4-person team to study the effect of substrates on bacterial mechanics.
- Prepared agarose gels and bacterial samples for time-lapse traction force microscopy.
- Characterized fiber network remodeling of hydrogels under compression.
- Analyzed deformation of biofilms on polyacrylamide gels over time using particle image velocimetry algorithm (MATLAB) and solved for force by finite element analysis (ANSYS).

Computational Biophysics, Image Analysis, and Cancer Biology: WPI, 8/2015 – 9/2020 [10-12]

- Collaborated on a 2-person team to study the effect of cancer markers on cell mechanics.
- Prepared hydrogels and biological samples for atomic force and traction force microscopy.
- Cleaned up AFM force curve data and fitted them to Hertzian contact model. (MATLAB)
- Characterized cellular traction by tracking substrate deformation with particle image velocimetry algorithm (MATLAB) and finite element analysis (ANSYS).
- Optimized traction force algorithm for time-series analysis with parallel computing (MATLAB).
- Performed immunofluorescence study of cells' cytoskeletal organization to investigate mutations in cells' mechanical properties and traction force application.
- Studying cell migration using directional autocorrelation algorithm (Python, VBA).
- Porting traction force code to Python for free and cross-platform usage (FOSS).
- GitHub: github.com/htmtri (MatlabTFM and pythonTFM)

Biomedical Design, Image Analysis, Simulation and Cell Biology, WPI, 8/2015 – 5/2018 [13-14]

- Collaborated on a 2-person team to design an optical tweezer setup for in vitro cell study.
- Simulated the optical and heating effect of optical fiber on cells/substrates. (MATLAB)
- Prepared hydrogels and biological samples for optical stretching experiments.
- Analyzed cell stretching result using image correlation algorithm (Java, MATLAB).

Major Qualifying Projects, Simulation, WPI, 08/2013 – 05/2014. [15]

- Studied radiation effects of a radiotherapy source using Monte Carlo simulation (MATLAB).

Interactive Qualifying Projects, Data Analysis, WPI, 08/2012 – 04/2013. [16]

- Compared the effectiveness of directive feedback in helping students in mastering specific mathematical skill using ASSISTments (Excel, Prism).

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- Developed mathematical problem sets for sixth graders in ASSISTments.

Skills:

Computer Skills:

- Main languages: MATLAB (10+ years), Python (5+ years).
- Other languages/software: Java (ImageJ), ANSYS, JavaScript (d3.js), C++, R, VBA, Adobe (Photoshop, Illustrator), and Prism/JASP.

Lab Techniques:

- Wet Lab (10+ years): Cell culture (mammalian, bacteria), gel fabrication, immunofluorescence, cryopreservation, 3D invasion assay, microfluidic, microfabrication, micropatterning (PRIMO).
- Microscopy: Fluorescence microscopy, traction force microscopy, , optical tweezer, confocal microscopy, atomic force microscopy.

Education:

Worcester Polytechnic Institute (WPI), Worcester, MA, 2010-2020

-Doctor of Philosophy in Physics, GPA: 3.84/4.0, September 2020
Dissertation title: "Effects of cancerous mutations on mechanosensing of cells"
Committee: Dr. Qi Wen (Advisor), Dr. Billiar Kristen, Dr. Kun-ta Wu, Dr. Douglas Petkie (Chair)

-Bachelor of Science in Physics, Minor in Computer Science GPA: 3.95/4.0, May 2014
Major Qualifying Project: "Monte Carlo Characterization of the M15 IR-192 brachy source"
Advisor: Dr. Medich David
Interactive Qualifying Project: "Effectiveness of Directive Feedback using ASSISTments"
Advisor: Dr. Cristina Heffernan

Experience:

Postdoctoral Researcher: BioInspired Institute, Syracuse University (SU), 12/2020-present

- Performing cell experiments on 3D assay and microfluidic chips
- Analyzing microscopic images and implementing simulation
- Managing microscopic and microfabrication tools
- Maintaining cell cultures, including cell propagation, maintenance and cryopreservation.
- Mentoring graduate, undergraduate, lab assistants working in research lab

Research Assistant: WPI, 2017-2020

- Managing lab supplies and microscopic equipment.
- Maintaining cell cultures, including cell propagation, maintenance and cryopreservation.
- Mentoring senior undergraduate and new graduate students working on research projects.

Teaching Assistant: WPI 2018

- Planned assignments, led discussion sections, graded papers and presentations for several complex experiments in Intermediate Physics Labs: Photon Interference, Superconductivity, Thompson experiment, Cavendish experiment.
- Participated in integrating interactive computing (Jupyter) for live code, equations and data visualizations for Introductory Physics Labs.

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Graduate Mentor: WPI, 2017

- Participated in creating an outreach program, Research Experience for Undergraduates (REU), for middle-school students.
- Mentored a middle-school student on a one-month research experience, known as the WPI Innovations in Bioengineering program, with focus in Biophysics/Mechanobiology.

Teaching Assistant: WPI, 2014-2016

- Guided and graded assignments in Introductory Physics Labs: Classical Mechanics, Electromagnetism, Modern Physics, Oscillation and Waves.

Conference Presentations:

- "Vimentin intermediate filaments enhance collective cell migration through 3D extracellular matrix networks", The Cell Bio 2025 meeting, American Society of Cell Biology (ASCB), Philadelphia, December 2025
- "Vimentin intermediate filaments enhance collective cell migration through 3D extracellular matrix networks", Gordon Research Conference on Soft Matter, New London, June 2025
- "Vimentin intermediate filaments enhance collective cell migration through 3D extracellular matrix networks", Gordon Research Conference on Intermediate Filaments, Barcelona, Spain, June 2024
- "Vimentin enhances collective cell migration through 3D ECM", 68th Annual Biophysical Society (BPS) Meeting, Philadelphia, February 2024
- "Vimentin enhances collective cell migration through 3D ECM", The Cell Bio 2023 meeting, American Society of Cell Biology (ASCB), Boston, December 2023
- "Vimentin intermediate filaments enhance collective cell migration through 3D extracellular matrix networks", 67th Annual Biophysical Society (BPS) Meeting, San Diego, February 2023.
- "Vimentin intermediate filaments increase collective cell migration through extracellular matrix network", American Physical Society (APS) March Meeting 2022, Chicago, March 2022.
- "Vimentin effects on cells' mechanosensing," 64th Annual Biophysical Society (BPS) Meeting, San Diego, February 2020.
- "Vimentin effects on cells' mechanical properties," 44th Annual Northeast Bioengineering Conference (NEBEC) Meeting, Philadelphia, March 2018.
- "Vimentin effects on mechanosensitivity of cells", American Physical Society (APS) New England Section, Worcester, March 2017

Honors and Awards:

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|---|-----------|
| - Graduation with High Distinction, WPI | 2014 |
| - Academic Awards, Dean's List, WPI | 2010-2014 |
| - Academic Scholarship, Physics, WPI | 2010-2014 |
| - Tau Beta Pi Scholarship, Physics Engineering, WPI | 2012 |

Professional Membership:

- | | |
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| American Society of Cell Biology | 2023-present |
| Biophysical Society | 2020-present |
| American Physical Society | 2019-present |

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Tau Beta Pi - The Engineering Honor Society

2011-2014

Activities:

Facilities Manager: Blatt Biomagning Center, BioInspired Institute, SU 2025-present

- Supervising/Training users on confocal microscope system.
- Managing and performing maintenance on confocal microscopes.

Organizer: Soft Matter and Biophysics Seminar Series, BioInspired Institute, SU 2020-2024

- Soliciting and inviting guests suggested by faculties and staffs for seminar presentations.
- Organizing guests' visit schedule and accommodation.
- Organizing/Leading seminar lunch between guests and graduate students.

Publication:

- [1] Maxx Swoger, **Minh Tri Ho Thanh**, Fitzroy J. Byfield, Van Dam, Jessica Williamson, Bronson Frank, Heidi Hehnly, Daniel Conway, Alison E. Patteson. Vimentin molecular linkages with nesprin-3 enhance nuclear deformations by cell geometric constraints. bioRxiv [Preprint], 2025
- [2] Ana N. Strat, Suhani Patel, **Minh-Tri Ho Thanh**, Alexander Kirschner, Souvik Ghosh, Michael P. Geiss, Mariano Viapiano, Yutao Liu, Alison E. Patteson, Samuel Herberg, Preethi S. Ganapathy. Harnessing cell-encapsulated hydrogels to study astrocyte mechanoresponse in 4D. bioRxiv [Preprint], 2025
- [3] **MT Ho Thanh**, A Poudel, S Ameen, B Carroll, M. Wu, P Soman, T Zhang, J.M. Schwarz, A. E. Patteson. Vimentin promotes collective cell migration through collagen networks via increased matrix remodeling and spheroid fluidity. bioRxiv [Preprint], 2024
- [4] T Zhang, S Ameen, S Ghosh, K Kim, **MT Ho Thanh**, A. E. Patteson, M. Wu, JM Schwarz. Enhanced extracellular matrix remodeling due to embedded spheroid fluidization. bioRxiv [Preprint], 2024
- [5] R Saldanha, **MT Ho Thanh**, N Krishnan, H Hehnly, A Patteson. Vimentin supports cell polarization by enhancing centrosome function and microtubule acetylation. J. R. Soc. Interface.21. 2024
- [6] Robert Bucki, Daniel V Iwamoto, Xuechen Shi, Katherine E Kerr, Fitzroy J Byfield, Łukasz Suprewicz, Karol Skłodowski, Julian Sutaria, Paweł Misiak, Agnieszka Z Wilczewska, Sekar Ramachandran, Aaron Wolfe, **Minh-Tri Ho Thanh**, Eli Whalen, Alison E Patteson, Paul A Janmey. Extracellular vimentin is sufficient to promote cell attachment, spreading, and motility by a mechanism involving N-acetyl glucosamine-containing structures - Journal of Biological Chemistry, 2023
- [7] B Carroll, **MTH Thanh**, AE Patteson. Dynamic remodeling of fiber networks with stiff inclusions under compressive loading. - Acta biomaterialia, 2023
- [8] ME Asp, **MTH Thanh**, S Dutta, JA Comstock, RD Welch, AE Patteson. Mechanobiology as a tool for addressing the genotype-to-phenotype problem in microbiology. - Biophysics Reviews, 2023
- [9] ME Asp, **MT Ho Thanh**, DA Germann, RJ Carroll, A Franceski, RD Welch, AGopinath, AE Patteson. Spreading rates of bacterial colonies depend on substrate stiffness and permeability. - PNAS nexus, 2022

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- [10] **MT Ho Thanh**, A Grella, D Kole, S Ambady, Q Wen. Vimentin intermediate filaments modulate cell traction force but not cell sensitivity to substrate stiffness. - Cytoskeleton, 2021
- [11] C Ti, Y Shen, **MT Ho Thanh**, Q Wen, Y Liu. Reliable and mobile all-fiber modular optical tweezers. Sci Rep 10, 20099 (2020). <https://doi.org/10.1038/s41598-020-77067-1>
- [12] W Linthicum, **MTH Thanh**, MI Vitolo, Q Wen. Overexpression on Mechanical Properties of Breast Epithelial Cells. - Effects of PTEN Loss and Activated KRAS International Journal of Molecular Sciences, 2018. 19(6): p. 1613.
- [13] C Ti, **MTH Thanh**, Y Shen, Q Wen, Y Liu. Fiber Optical Tweezers for Applying and Measuring Forces in a 3D Solid Compartment. (February 14th 2018). Selected Topics on Optical Fiber Technologies and Applications, IntechOpen, DOI: 10.5772/intechopen.71757.
- [14] C Ti, **MT Ho-Thanh**, Q Wen, Y Liu. Objective-lens-free Fiber-based Position Detection with Nanometer Resolution in a Fiber Optical Trapping System. Scientific Reports, 2017. 7(1): p. 13168.
- [15] **MTH Thanh**, JJ Munro III, DC Medich. Dosimetric characterization of the high-dose-rate brachytherapy source using the AAPM and ESTRO formalism. Journal of Applied Clinical Medical Physics, 2015. 16(3): p. 305-317
- [16] Trieu, Nghia Kien, Anh Hoang Do, and **Minh-Tri Ho Thanh**. Effectiveness of Directive Feedback Using Assistments. Worcester: Worcester Polytechnic Institute, 2013.