

# 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](https://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 tweezers, 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", 67<sup>th</sup> 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," 64<sup>th</sup> Annual Biophysical Society (BPS) Meeting, San Diego, February 2020.
- "Vimentin effects on cells' mechanical properties," 44<sup>th</sup> 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:

- 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:

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 Biologning 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 Suprawicz, 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.