

## Rachel M. Lee, PhD

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Bioimage Analysis Lead, Advanced Imaging Center, Janelia Research Campus  
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- EDUCATION**
- Doctor of Philosophy, Physics** August 2016  
University of Maryland – College Park, Maryland  
*Doctoral Thesis:* “Guided Migration and Collective Behavior: Cell Dynamics During Cancer Progression”  
4.0 GPA
- Bachelor of Science, Physics** May 2010  
**Bachelor of Science, Chemical Engineering**  
University of Arkansas – Fayetteville, Arkansas  
*Minor:* Mathematics  
*Honors Thesis:* “Liposomes as Carriers for Drug Delivery”  
4.0 GPA, *summa cum laude*
- EXPERIENCE**
- Bioimage Analysis Lead** 2025–Present  
**Bioimage Data Analyst** 2021–2025  
Advanced Imaging Center  
Janelia Research Campus
- Supported biomedical research groups from around the globe in image analysis.
  - Developed analysis tools and created visualizations of microscopy data.
  - Organized and taught at local and international microscopy workshops.
- Postdoctoral Fellow** 2017–2021  
Marlene and Stewart Greenebaum Comprehensive Cancer Center  
University of Maryland School of Medicine, Baltimore  
*Advisor:* Stuart S. Martin
- Received competitive funding from Cancer Biology T32 Program (2017–2019).
  - Measured changes in migration dynamics for a genetically-defined cancer model system, leading to a first-author publication in *Scientific Reports*.
  - Collaborated with biologists and clinicians to develop analysis tools supporting multiple cancer studies, including key analysis for a publication in *PNAS*.
- Postdoctoral Associate** 2016–2017  
Institute for Physical Science and Technology, University of Maryland  
*Advisors:* Wolfgang Losert and John T. Fourkas
- Measured migration behavior and actin dynamics on nanotopographic surfaces.
  - Collaborated with chemists and physicists to apply optical flow techniques to actin dynamics, leading to a co-first-author publication in *MBoC*.
- Graduate Student** 2010–2016  
Department of Physics, University of Maryland, College Park  
*Advisor:* Wolfgang Losert
- Supported by a NSF Graduate Research Fellowship (2010–2013).
  - Received competitive funding from the ARCS Foundation (2013–2016).
  - Developed image analysis pipelines and nonlinear dynamics metrics for the study of collective cell migration dynamics, leading to 4 first-author publications.

- Collaborated with Carole A. Parent and colleagues at National Cancer Institute to study migration dynamics during metastatic breast cancer.

**Undergraduate Student**

2007–2010

Department of Physics, University of Arkansas, Fayetteville

Advisor: Gregory Salamo

- Measured drug delivery properties of temperature-sensitive liposomes.
- Supported by the Department of Physics (2009–2010) and the University of Arkansas Howard Hughes Medical Institute Research Studio (2007–2009).

**PUBLICATIONS *Preprints***

1. T. C. Paul, Y. M. Loyd, S. E. Chase, T. W. O'Connor, C. M. Hobson, R. M. Lee, D. Vorselen, and M. Krendel. Myo1e/f regulate phagocytic podosomes to promote efficient cup closure in macrophages. *bioRxiv*, 2026. doi:10.64898/2026.04.30.721640
2. C. M. Hobson, K. Izumi, J. S. Aaron, N. K. Bharathan, M. F. Ceriani, W. Giang, J. I. Ispizua, A. P. Kowalczyk, **R. M. Lee**, E. A. Morales, O. F. Puls, E. Quarles, M. Rodriguez-Caron, S. N. Stahley, F. Tassara, S. Wang, S. Yao, T. Tsuchiya, and T.-L. Chew. Adapting Upright Light Sheet Fluorescence Microscopy for Imaging at Air-Liquid Interface. *bioRxiv*, 2026. doi:10.64898/2026.04.07.716945
3. **R. M. Lee**, L. R. Eisenman, C. Hobson, J. S. Aaron, and T.-L. Chew. Measuring Amorphous Motion: Application of Optical Flow to Three-Dimensional Fluorescence Microscopy Images. *bioRxiv*, 2026. doi:10.64898/2026.03.06.710169
4. M. E. Utgaard, A. Caillier, S. Chandrasekar, J. J. Tidei, H. Balasubramanian, **R. M. Lee**, O. Puls, S. Khuon, J. Aaron, T.-L. Chew, J. R. Beach, and P. W. Oakes. Mechanically-induced Septin Networks Protect Nuclear Integrity. *bioRxiv*, 2026. doi:10.64898/2026.01.20.700414

***Peer-Reviewed Publications***

5. M. L. Mull, S. J. P. Pratt, K. N. Thompson, D. A. Annis, **R. M. Lee**, J. A. Ju, D. E. Gilchrist, M. B. Stemberger, L. Boyman, W. J. Lederer, M. I. Vitolo, and S. S. Martin. Disruption of P2Y2 Signaling Promotes Breast Tumor Cell Dissemination by Reducing ATP-Dependent Calcium Elevation and Actin Localization to Cell Junctions. *International Journal of Molecular Sciences*, 26(9):4286, 2025. Publisher: Multidisciplinary Digital Publishing Institute. doi:10.3390/ijms26094286
6. **R. M. Lee**, L. R. Eisenman, S. Khuon, J. S. Aaron, and T.-L. Chew. Believing is seeing – the deceptive influence of bias in quantitative microscopy. *Journal of Cell Science*, 137(1):jcs261567, 2024. doi:10.1242/jcs.261567  
– Associated data and analysis scripts are available on [FigShare](#).
7. E. M. Mulhall, A. Gharpure, **R. M. Lee**, A. E. Dubin, J. S. Aaron, K. L. Marshall, K. R. Spencer, M. A. Reiche, S. C. Henderson, T.-L. Chew, and A. Patapoutian. Direct observation of the conformational states of PIEZO1. *Nature*, pages 1–9, 2023. Publisher: Nature Publishing Group. doi:10.1038/s41586-023-06427-4  
– Associated analysis tools are available on [GitHub](#).
8. Y. Zhang, **R. M. Lee**, Z. Zhu, Y. Sun, K. Zhu, Z. Xu, F. Lin, T. Pan, W. Losert, and M. Zhao. Protocol for electrotaxis of large epithelial cell sheets. *STAR Protocols*, 4(2):102288, 2023. doi:10.1016/j.xpro.2023.102288
9. E. Serna-Morales, B. J. Sánchez-Sánchez, S. Marcotti, A. Nichols, A. Bhargava, A. Dragu, L. M. Hirvonen, M.-d.-C. Díaz-de-la Loza, M. Mink, S. Cox, E. Rayfield, **R. M. Lee**, C. M. Hobson, T.-L. Chew, and B. M. Stramer. Extracellular matrix assembly stress initiates Drosophila central nervous system morphogenesis.

- Developmental Cell*, 58(10):825–835.e6, 2023. doi:10.1016/j.devcel.2023.03.019
10. K. T. Chang, K. N. Thompson, S. J. P. Pratt, J. A. Ju, **R. M. Lee**, T. J. Mathias, M. L. Mull, D. A. Annis, E. C. Ory, M. B. Stemberger, M. I. Vitolo, and S. S. Martin. Elevation of Cytoplasmic Calcium Suppresses Microtentacle Formation and Function in Breast Tumor Cells. *Cancers*, 15(3):884, 2023. doi:10.3390/cancers15030884
  11. Y. Zhang, G. Xu, J. Wu, **R. M. Lee**, Z. Zhu, Y. Sun, K. Zhu, W. Losert, S. Liao, G. Zhang, T. Pan, Z. Xu, F. Lin, and M. Zhao. Propagation dynamics of electroactive motility in large epithelial cell sheets. *iScience*, 25(10), 2022. doi:10.1016/j.isci.2022.105136
  12. S. Gu, **R. M. Lee**, Z. Benson, C. Ling, M. I. Vitolo, S. S. Martin, J. Chalfoun, and W. Losert. Label-free cell tracking enables collective motion phenotyping in epithelial monolayers. *iScience*, 25(7), 2022. doi:10.1016/j.isci.2022.104678
  13. T. J. Mathias, J. A. Ju, **R. M. Lee**, K. N. Thompson, M. L. Mull, D. A. Annis, K. T. Chang, E. C. Ory, M. B. Stemberger, T. Hotta, R. Ohi, M. I. Vitolo, M.-J. Moutin, and S. S. Martin. Tubulin Carboxypeptidase Activity Promotes Focal Gelatin Degradation in Breast Tumor Cells and Induces Apoptosis in Breast Epithelial Cells That Is Overcome by Oncogenic Signaling. *Cancers*, 14(7):1707, 2022. doi:10.3390/cancers14071707
  14. M. A. Reiche, J. S. Aaron, U. Boehm, M. C. DeSantis, C. M. Hobson, S. Khuon, **R. M. Lee**, and T.-L. Chew. When light meets biology – how the specimen affects quantitative microscopy. *Journal of Cell Science*, 135(6):jcs259656, 2022. doi:10.1242/jcs.259656
  15. K. N. Thompson, J. A. Ju, E. C. Ory, S. J. P. Pratt, **R. M. Lee**, T. J. Mathias, K. T. Chang, C. J. Lee, O. G. Goloubeva, P. C. Bailey, K. R. Chakrabarti, C. M. Jewell, M. I. Vitolo, and S. S. Martin. Microtubule disruption reduces metastasis more effectively than primary tumor growth. *Breast Cancer Research*, 24(1):13, 2022. doi:10.1186/s13058-022-01506-2
  16. J. C. Reader, C. Fan, E. C.-H. Ory, J. Ju, **R. M. Lee**, M. I. Vitolo, P. Smith, S. Wu, M. M. N. Ching, E. B. Asiedu, C. M. Jewell, G. G. Rao, A. Fulton, T. J. Webb, P. Yang, A. D. Santin, H.-C. Huang, S. S. Martin, and D. M. Roque. Microtentacle formation in ovarian carcinoma. *Cancers*, 14(3):800, 2022. Number: 3 Publisher: Multidisciplinary Digital Publishing Institute. doi:10.3390/cancers14030800
  17. **R. M. Lee**, M. I. Vitolo, W. Losert, and S. S. Martin. Distinct roles of tumor associated mutations in collective cell migration. *Scientific Reports*, 11(1):10291, 2021. doi:10.1038/s41598-021-89130-6
    - Associated collective migration analysis tools are available on [GitHub](#).
    - Associated raw images are available from [IDR](#).
  18. S. J. P. Pratt, **R. M. Lee**, K. T. Chang, E. O. Hernández-Ochoa, D. A. Annis, E. C. Ory, K. N. Thompson, P. C. Bailey, T. J. Mathias, J. A. Ju, M. I. Vitolo, M. F. Schneider, J. P. Stains, C. W. Ward, and S. S. Martin. Mechanoactivation of NOX2-generated ROS elicits persistent TRPM8 Ca<sup>2+</sup> signals that are inhibited by oncogenic KRas. *Proceedings of the National Academy of Sciences*, 117(42):26008–26019, 2020. doi:10.1073/pnas.2009495117
    - Associated calcium signaling analysis tools are available on [GitHub](#).
  19. J. A. Ju, C. J. Lee, K. N. Thompson, E. C. Ory, **R. M. Lee**, T. J. Mathias, S. J. P. Pratt, M. I. Vitolo, C. M. Jewell, and S. S. Martin. Partial thermal imidization of polyelectrolyte multilayer cell tethering surfaces (TetherChip) enables efficient cell capture and microtentacle fixation for circulating tumor cell analysis. *Lab on a Chip*, 20(16):2872–2888, 2020. doi:10.1039/D0LC00207K

20. **R. M. Lee\***, L. Campanello\*, M. J. Hourwitz, P. Alvarez, A. Omidvar, J. T. Fourkas, and W. Losert. Quantifying topography-guided actin dynamics across scales using optical flow. *Molecular Biology of the Cell (Fourth Special Issue on Forces On and Within Cells)*, 31(16):1753–1764, 2020. doi:10.1091/mbc.E19-11-0614 (\*contributed equally to this study)
  - Associated actin images are available on [Mendeley Data](#).
  - Associated optical flow analysis code is available on [GitHub](#).
21. S. J. P. Pratt, **R. M. Lee**, and S. S. Martin. The Mechanical Microenvironment in Breast Cancer. *Cancers*, 12(6), 2020. doi:10.3390/cancers12061452
22. **R. M. Lee** and W. Losert. Dynamics phenotyping across length and time scales in collective cell migration. *Seminars in Cell & Developmental Biology*, 93:69–76, Sept. 2019. doi:10.1016/j.semcdb.2018.10.010
23. P. C. Bailey, **R. M. Lee**, M. I. Vitolo, S. J. P. Pratt, E. Ory, K. Chakrabarti, C. J. Lee, K. N. Thompson, and S. S. Martin. Single cell tracking of breast cancer cells enables highly accurate prediction of sphere formation using only early doubling information. *iScience*, 2018. doi:10.1016/j.isci.2018.08.015
  - Associated raw data is available on [Mendeley Data](#).
24. S. J. Pratt, E. O. Hernández-Ochoa, **R. M. Lee**, E. C. Ory, J. S. Lyons, H. C. Joca, A. Johnson, K. Thompson, P. Bailey, C. J. Lee, T. Mathias, M. I. Vitolo, M. Trudeau, J. P. Stains, C. W. Ward, M. F. Schneider, and S. S. Martin. Real-time scratch assay reveals mechanisms of early calcium signaling in breast cancer cells in response to wounding. *Oncotarget*, 9:25008–25024, 2018. doi:10.18632/oncotarget.25186
  - Associated calcium signaling analysis tools are available on [GitHub](#).
25. C. H. Stuelten, **R. M. Lee**, W. Losert, and C. A. Parent. Lysophosphatidic acid regulates the motility of MCF10CA1a breast cancer cell sheets via two opposing signaling pathways. *Cellular Signalling*, 45, 2018. doi:10.1016/j.cellsig.2018.01.005
26. Y. Zhang, G. Xu, **R. M. Lee**, Z. Zhu, J. Wu, S. Liao, G. Zhang, Y. Sun, A. Mogilner, W. Losert, T. Pan, F. Lin, Z. Xu, and M. Zhao. Collective cell migration has distinct directionality and speed dynamics. *Cellular and Molecular Life Sciences*, 74(20):3841–3850, 2017. doi:10.1007/s00018-017-2553-6
27. **R. M. Lee**, H. Yue, W.-J. Rappel, and W. Losert. Inferring single-cell behaviour from large-scale epithelial sheet migration patterns. *Journal of The Royal Society Interface*, 14(130):20170147, 2017. doi:10.1098/rsif.2017.0147
  - Associated data and code is available on [DRUM](#).
28. **R. M. Lee**, C. H. Stuelten, C. A. Parent, and W. Losert. Collective cell migration over long time scales reveals distinct phenotypes. *Convergent Science Physical Oncology*, 2:025001, 2016. doi:10.1088/2057-1739/2/2/025001
29. **R. M. Lee**, D. H. Kelley, K. N. Nordstrom, N. T. Ouellette, and W. Losert. Quantifying stretching and rearrangement in epithelial sheet migration. *New Journal of Physics*, 15(2):025036, 2013. doi:10.1088/1367-2630/15/2/025036
30. D. Fologea, E. Krueger, R. Al Faori, **R. M. Lee**, Y. I. Mazur, R. Henry, M. Arnold, and G. J. Salamo. Multivalent ions control the transport through lysenin channels. *Biophysical chemistry*, 152:40–45, Nov. 2010. doi:10.1016/j.bpc.2010.07.004
31. D. Fologea, E. Krueger, **R. M. Lee**, M. Naglak, Y. I. Mazur, R. Henry, and G. J. Salamo. Controlled gating of lysenin pores. *Biophysical chemistry*, 146(1):25–29, Jan. 2010. doi:10.1016/j.bpc.2009.09.014

32. W. R. Penney, **R. M. Lee**, M. E. Magie, and E. C. Clausen. Design projects in undergraduate heat transfer: Six examples from the fall 2007 course at the University of Arkansas. *Proceedings of the 2007 Midwest Section Conference of the American Society for Engineering Education*, 2007

**BLOG POSTS**

1. F. Puls, Owen and R. M. Lee. How do I get started with image analysis?, Dec. 2025. URL: <https://focalplane.biologists.com/2025/12/15/how-do-i-get-started-with-image-analysis/>

**FELLOWSHIPS**

T32 Trainee Fellowship in Cancer Biology	2017–2019
ARCS Foundation Scholar (JCM Foundation)	2014–2016
ARCS Endowed Fellowship	2013–2014
NSF Graduate Fellowship	2010–2013
University Graduate Fellowship, University of Maryland	2010–2012
Computer, Mathematical, and Physical Sciences Dean’s Fellowship	2010
Goldwater Scholar	2009–2010
University of Arkansas Bodenhamer Fellow	2005–2010
State Undergraduate Research Fellowship	2008–2009
National Merit Scholar	2005
Arkansas Governor’s Distinguished Scholar	2005–2009
Carl B. & Florence E. King Foundation Scholar	2005–2009

**AWARDS**

Top Poster, Postdoctoral Poster Presentation, UMB Cancer Biology Retreat	2021
First Place, Postdoctoral Poster Presentation, UMB Cancer Biology Retreat	2019
Best Postdoctoral Oral Presentation, UMB Cancer Biology Retreat	2018
University of Maryland School of Medicine Postdoctoral Travel Award	2018
First Place, Trainee Poster Competition, UMGCCC Research Day	2017
George A. Snow Memorial Award, UMD Physics	2016
– <i>For helping advance the representation of women in the field of physics</i>	
SIAM Student Travel Award	2015
Biophysics Category Poster Winner, UMD Bioscience Day	2013
Arkansas INBRE Physics Poster Competition, First place	2009
Honors College Study Abroad Grant	2007, 2009
Girl Scout Gold Award Recipient	2005

**TEACHING EXPERIENCE****International Microscopy Workshops**

- Led lectures on topics including FIJI, object tracking, machine learning, and analysis best practices. Contributed to workshop planning and logistics.
- Optical Imaging Across Biological Length Scales (**Co-Organizer**)  
Janelia Research Campus, United States July 2024
- Optical Imaging Across Biological Length Scales: From Nanometers to Millimeters  
Janelia Research Campus, United States July 2022
- Imaging Latin America 2022  
Institut Pasteur Montevideo, Uruguay September 2022
- Imaging Africa 2022  
Univeristy of Cape Town, South Africa October 2022
- Principles and approaches to digital image processing and analysis  
Aarhus University, Denmark June 2023

**Guest Lecturer, Molecular Medicine Survival Skills** 2019, 2020

- Developed and presented lecture on *Introduction to Statistics* for GPLS 647.
- Graduate level course on scientific communication and practical research skills.

- Lead Instructor, MATLAB Boot Camp** 2013-2017
- Week long session designed to prepare summer students for image analysis projects. Also attended by researchers from the National Institutes of Health.
  - Developed curriculum, lectures, and in-class problem sets.
  - Led sessions as a lecturer and provided guidance during student coding sessions.

**MENTORING**

**Research Students**

- Tarini Basireddy, High School Graduate Summer 2023
- Shuyao Gu, Graduate Student, Physics 2020–2021
- Phillip Alvarez, Graduate Student, Biophysics 2017–2021
- Bianca Reginauld, Undergraduate, Biochemistry 2017–2020
- Esther Maidoh, Undergraduate, Pre-Med 2017–2020
- Deborah Hemingway, Graduate Student, Biophysics 2016–2018
- Alan Li, High School Student Summer 2014
- Ryan Shute, Undergraduate, Pre-Med Spring 2013
- Peter Kordell, Undergraduate, Physics Fall 2011

**Women in Physics Mentoring Program**

- Mengwen Shi, Undergraduate, Physics 2020–Present
- Lisa Maszkiewicz, Undergraduate, Physics 2014–2015

**SERVICE**

**Peer Reviewer**

- Journal of the Royal Society Interface
- Journal of Visualized Experiments
- Nature Communication
- Nature Methods
- Microscopy and Microanalysis
- PLOS Computational Biology
- PLOS ONE

**Conference Organization and Service**

- University of Maryland Cancer Biology Research Retreat 2017, 2018  
*Member of organizing committee*
- American Physical Society March Meeting 2015, 2019  
*Session chair for Physics of Cancer focus session*
- Mid-Atlantic Conference for Undergraduate Women in Physics 2013–2014  
*Member of local organizing committee. Developed and maintained website. Led social media presence. Moderated a panel discussion during the event.*

**Webmaster**

- Univ. of Maryland Women in Physics Summer 2013–Spring 2016  
*Developed and maintained website. Managed social media presence. Member of organizing committee for panel discussion of physics careers outside academia.*

**President**

- Univ. of Arkansas Society of Physics Students Fall 2009–Spring 2010
- Univ. of Arkansas Sigma Pi Sigma Fall 2009–Spring 2010

**Treasurer**

- Univ. of Arkansas Society of Physics Students Fall 2007–Spring 2009
- Univ. of Arkansas American Institute of Chemical Engineers 2007

**INVITED  
TALKS**

- Object segmentation. *Future African Scientists Optics Workshop*, Oct 2024
- Imaging migration dynamics during cancer progression. *2019 University of Maryland Greenebaum NCI Comprehensive Cancer Center Cancer Imaging Retreat*, May 2019
- Dynamics phenotyping across length and time scales in collective cell migration. *Mathematics of the Cell: Mechanical and Chemical Signaling across Scales, Banff International Research Station*, August 2018
- Guided migration and collective behavior: Cell dynamics during cancer progression. *Department of Physics and Astronomy Colloquium, West Virginia University*, October 2017
- Guided migration and collective behavior: Cell dynamics during cancer progression. *Integrative Cancer Research Seminar, University of Maryland*, November 2016
- Studying the physics of cancer with cell migration dynamics. *Quince Orchard High School*, September 2016
- Studying the physics of cancer with cell migration dynamics. *U.S. Physics Team Training Camp, University of Maryland*, May 2016
- Quantifying collective cell migration during cancer progression. *SIAM Conference on Applications of Dynamical Systems, Minisymposium on Emerging Collective Patterns in Dynamic Swarms*, May 2015
- Quantifying collective cell migration during cancer progression. *Eleventh Annual Symposium of the Burgers Program for Fluid Dynamics, University of Maryland*, November 2014
- Studying the physics of cancer with cell migration dynamics. *Summer Girls Program, University of Maryland*, August 2014, 2015, 2017
- Quantifying collective migration in cancer progression. *University of Arkansas Physics Colloquium*, March 2014
- Fighting cancer with biophysics. *Institute for Academic Challenge Community Seminar Series*, March 2013
- Quantifying collective migration in cell monolayers. *University of Maryland Applied Dynamics Seminar*, November 2012
- Liposomes as carriers for drug delivery. *Sigma Pi Sigma Induction Ceremony, University of Arkansas*, April 2010
- Developing and visualizing nano-carriers for cellular drug delivery. *Undergraduate Research Colloquium, University of Arkansas Physics Department*, September 2008

**TALKS &  
POSTERS**

- R. M. Lee, M. Vitolo, W. Losert, and S. S. Martin. Distinct roles of tumor associated mutations in collective cell migration. *11th Annual Cancer Biology Research Retreat, University of Maryland Baltimore*, June 2021. (poster) – **Postdoctoral Poster Competition Winner**
- R. M. Lee, M. Vitolo, W. Losert, and S. S. Martin. Distinct roles of tumor-associated mutations in collective cell migration. *American Physical Society March Meeting*, March 2021
- R. M. Lee, M. J. Hourwitz, K. Thompson, M. Vitolo, J. T. Fourkas, W. Losert, and S. S. Martin. The role of cell migration guidance cues in collective behavior. *10th Annual Cancer Biology Research Retreat, University of Maryland Baltimore*, June 2019. (poster) – **1st Place, Postdoctoral Poster Competition**
- R. M. Lee, M. J. Hourwitz, K. Thompson, M. Vitolo, J. T. Fourkas, W. Losert, and S. S. Martin. The role of cell migration guidance cues in emergent collective behavior. *American Physical Society March Meeting*, March 2019
- R. M. Lee, H. Yue, C. Stuelton, W.-J. Rappel, C. A. Parent, and W. Losert. Collective

- dynamics over long time scales and large length scales reveals distinct cell migration phenotypes. *2018 APS Mid-Atlantic Annual Meeting*, November 2018. (poster)
- R. M. Lee. Response of collective cell migration to surface topography reveals distinct phenotypes. *9th Annual Cancer Biology Research Retreat, University of Maryland Baltimore*, April 2018. – **Award for Best Postdoctoral Oral Presentation**
- R. M. Lee, M. J. Hourwitz, K. Thompson, M. Vitolo, J. T. Fourkas, W. Losert, and S. S. Martin. Response of collective cell migration to surface topography reveals distinct phenotypes. *American Physical Society March Meeting*, March 2018
- R. M. Lee, H. Yue, C. Stuelton, W.-J. Rappel, C. A. Parent, and W. Losert. Collective dynamics over long time scales and large length scales reveals distinct cell migration phenotypes. *2017 ASCB Annual Meeting*, December 2017. (poster). [doi:10.1091/mbc.E17-10-0618](https://doi.org/10.1091/mbc.E17-10-0618)
- R. M. Lee, C. Stuelton, C. A. Parent, and W. Losert. Collective cell migration over long time scales reveals distinct phenotypes. *UMGCCC Research Day*, September 2017. (poster) – **1st Place, Trainee Poster Competition**
- R. M. Lee, B. U. S. Schmidt, L. Campanello, M. J. Hourwitz, J. T. Fourkas, and W. Losert. Physical guidance of the actin cytoskeleton and cell migration dynamics in epithelial cells. *American Physical Society March Meeting*, March 2017
- R. M. Lee, C. Stuelton, C. A. Parent, and W. Losert. Collective cell migration over long time scales reveals distinct phenotypes. *Directed Cell Migration Gordon Research Conference*, January 2017. (poster)
- R. M. Lee, S. Das, M. Hourwitz, X. Sun, C. Parent, J. Fourkas, and W. Losert. Nanotopography guides and directs cell migration in amoeboid and epithelial cells. *American Physical Society March Meeting*, March 2016
- S. Das, R. M. Lee, M. Hourwitz, X. Sun, C. Parent, J. T. Fourkas, and W. Losert. Nanoridges guide and direct cell migration via cytoskeletal alignment. *2015 Annual Meeting of the International Physics of Living Systems (iPoLS) Network*, July 2015. (poster)
- R. M. Lee, H. Yue, W.-J. Rappel, and W. Losert. Characterization of collective cell migration dynamics. *American Physical Society March Meeting*, March 2015
- R. M. Lee, C. Stuelton, C. A. Parent, and W. Losert. Quantifying collective cell migration during cancer progression. *Directed Cell Migration Gordon Research Conference*, January 2015. (poster)
- R. M. Lee. Quantifying collective cell migration during cancer progression. *Directed Cell Migration Gordon Research Seminar*, January 2015
- R. M. Lee, C. Stuelten, K. Nordstrom, D. Kelley, N. Ouellette, C. Parent, and W. Losert. Quantifying collective cell migration during cancer progression. *International Meeting of the Physics of Living Systems Student Research Network*, July 2014
- R. M. Lee, C. Stuelten, K. Nordstrom, C. Parent, and W. Losert. Quantifying collective cell migration during cancer progression. *American Physical Society March Meeting*, March 2014
- R. M. Lee, D. H. Kelley, K. N. Nordstrom, M. Weiger, C. Stuelton, C. A. Parent, N. T. Ouellette, and W. Losert. Quantifying collective migration in cancer progression. *University of Maryland Bioscience Day*, November 2013. (poster) – **Biophysics Category Poster Winner**
- R. M. Lee, D. H. Kelley, K. N. Nordstrom, N. T. Ouellette, and W. Losert. Quantifying stretching and rearrangement in epithelial sheets. *American Physical Society March Meeting*, March 2013
- R. M. Lee, D. H. Kelley, K. N. Nordstrom, M. Weiger, C. Stuelton, C. A. Parent, N. T. Ouellette, and W. Losert. Quantifying stretching and rearrangement in epithelial

sheets. *Directed Cell Migration GRC*, January 2013. (poster)

R. M. Lee, D. H. Kelley, K. N. Nordstrom, M. Weiger, C. Stuelton, C. A. Parent, N. T. Ouellette, and W. Losert. Quantifying stretching and rearrangement in epithelial sheets. *University of Maryland Bioscience Day*, November 2012. (poster)

R. M. Lee, M. Weiger, C. Stuelton, C. A. Parent, and W. Losert. Analysis of collective forces involved in epithelial sheet migration. *12th Annual Center for Cancer Research Fellows and Young Investigators Colloquium*, March 2012. (poster)

R. M. Lee, M. Weiger, C. Stuelton, C. A. Parent, and W. Losert. Analysis of collective forces involved in epithelial sheet migration. *8th Annual NIH Graduate Student Research Symposium*, January 2012. (poster)

R. M. Lee, M. Weiger, C. Stuelton, C. A. Parent, and W. Losert. Analysis of collective forces involved in epithelial sheet migration. *Dynamics Days (Baltimore, Maryland)*, January 2012. (poster)

R. M. Lee, M. Weiger, C. Stuelton, C. A. Parent, and W. Losert. Mechanics of collective cell motion. *UMD-NCI Cancer Technology Workshop, National Institute of Health*, November 2011. (poster)

R. Lee, R. Henry, G. Salamo, and D. Fologea. Liposomes as carriers for drug delivery. *Nanotechnology for Health Care, Winthrop Rockefeller Institute*, January 2010. (poster)

R. Lee, M. Naglak, R. Henry, G. Salamo, and D. Fologea. Uptake and release of drugs and nanoparticles from liposomes. *Arkansas INBRE Fall 2009 Research Conference*, October 2009. (poster) – **1st place, Physics Poster Competition**

R. Lee, M. Naglak, R. Henry, G. Salamo, and D. Fologea. Uptake and release of drugs and nanoparticles from liposomes. *Nanotechnology for Health Care, Winthrop Rockefeller Institute*, January 2009. (poster)

R. Lee, M. Naglak, R. Henry, G. Salamo, and D. Fologea. Liposomal carriers for drug delivery. *Sigma Pi Sigma 2008 Quadrennial Congress, Fermi National Accelerator Laboratory*, November 2008. (poster)

## INTERVIEWS

Ask Rachel Lee about: The physics of migrating cancer cells. *BioBuzz*, 2016. URL: <https://biohive.breezio.com/discussion/4580442791158482829/>

K. Keefe. Rachel Lee - Medical Researcher - Univ. of Maryland. *LabTV on YouTube*, 2014. URL: <http://youtu.be/JHWeScGj4DI>

J. Powviriya. Researchers use fat to fight cancer. *University of Arkansas Research Frontiers*, 2009. URL: <https://researchfrontiers.uark.edu/researchers-use-fat-to-fight-cancer/>

## ADDITIONAL TRAINING

Office of Postdoctoral Scholars, UM School of Medicine July 2018  
*Responsible Conduct of Research for Postdoctoral Fellows (Year Long Course)*

Office of Intramural Training and Education, NIH December 2015  
*Workplace Dynamics Certification*

L'École de Physique des Houches Summer School July 2012  
*Soft Interfaces*

J.M. Burgerscentrum Course October 2011  
*Particle Image Velocimetry*

## COMPUTER SKILLS

*Published image and data analysis workflows are available at [github.com/ScientistRachel](https://github.com/ScientistRachel)*

- Python
- MATLAB

- ImageJ/Fiji
- Imaris
- AGAVE
- Blender
- HTML/CSS
- Inkscape/GIMP
- Mathematica

<b>AFFILIATIONS</b>	American Physical Society	2007–Present
	Society of Physics Students	2006–2016
	American Institute of Chemical Engineers	2005–2010
	Phi Beta Kappa	Inducted Spring 2010
	Sigma Pi Sigma	Inducted Spring 2009
	Tau Beta Pi	Initiated Spring 2007
	Girl Scouts of the USA	Lifetime Membership
<b>COMMUNITY OUTREACH</b>	Maryland Day	2011-2014, 2017, 2019
	Girls Excelling in Math and Science (GEMS)	2016
	Physics is Phun	2011
	Society of Physics Students Haunted Lab Outreach	2006–2009
	Physics Fantastic Fun and Follies Fair	2009
	Student Day of Caring	2007
	Make a Difference Day	2005, 2006