

Kevin M. Dean, Ph.D.

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VISION

As a scientist, I am dedicated to advancing and scaling imaging technologies that enable the cancer research community to interrogate tissue complexity at unprecedented levels of resolution and throughput. My research focuses on developing and disseminating tools that bridge cutting-edge microscopy, automation, and computational analysis to uncover the molecular and cellular mechanisms underlying cancer progression. With a strong history of completing interdisciplinary and collaborative research projects, I have led efforts to transform how biologists access and utilize advanced imaging platforms.

EDUCATION

Ph.D., Biochemistry

University of Colorado, Boulder, CO, USA.

GPA: 3.9

2007 - 2013

Dissertation: Fluorescent Proteins: Spectroscopic Studies, Microfluidic Analysis, and Generation of Improved Variants. Research conducted under the guidance of Drs. Amy E. Palmer and Ralph Jimenez.

B.A., Chemistry

Willamette University, Salem, OR, USA.

GPA: 3.64

December 2002 - 2006

Thesis: Laser Light Scattering Investigations of the Isobutyric Acid/Water Binary Liquid System. Research conducted under the guidance of Dr. J. Charles Williamson.

RESEARCH & WORK ACTIVITIES

Professional Positions

Tenure-Track Assistant Professor

2022 – Present

Lyda Hill Department of Bioinformatics and Cecil H. and Ida Green Center for Systems Biology, UT Southwestern Medical Center, Dallas, TX, USA.

My lab aims to establish a broadly generalizable method for studying cell biological processes within complex tissues such as the hematopoietic niche. This includes creating advanced tissue processing techniques that enable interrogation of the location and activation state for 20 different proteins with 80 nm resolution, deep tissue imaging microscopes that adapt to and optimally probe the biological specimen, and cutting-edge software that comprehensively analyzes the architecture of single cells throughout entire tissues. Ultimately, our goal is to bridge the gap between traditional cell biology and the complex reality of living organisms, providing deeper insights into health and disease. Member of the Biomedical Engineering and Molecular Biophysics Graduate Programs, and the Simmons Comprehensive Cancer Center's Development and Cancer Program.

Research-Track Assistant Professor, and Director of the Microscopy Innovation Lab

2018 – 2022

Department of Cell Biology, UT Southwestern Medical Center, Dallas, TX, USA.

The pace of microscopy technology development far outstrips the rate at which it can be commercialized and delivered to the greater biological community. The Microscopy Innovation Lab at UT Southwestern works to eliminate this delay by developing potentially transformative instrumentation that is tailored to address specific biological questions, and engaging in close collaborations with life scientists to gain molecular insight into physiological and pathophysiological phenomena. Towards these means, I work one-on-one with diverse biomedical scientists and physicians to develop custom imaging workflows that synergistically combine advances in optical probes, sample preparation, instrument design and operation, and computer vision-based analyses of TB-scale datasets.

Postdoctoral Fellow, Fiolka and Danuser Laboratories 2014 – 2018
Lyda Hill Department of Bioinformatics, UT Southwestern Medical Center, Dallas, TX, USA.

Development and application of light-sheet microscopy and computer vision technologies to elucidate mechanisms of cell-extracellular matrix adhesions, Rho GTPase signaling, and cytoskeletal dynamics of breast cancer cells disseminating into 3D tissue-like environments. Ruth L. Kirschstein Postdoctoral Fellow. Research conducted under the guidance of Drs. Reto Fiolka and Gaudenz Danuser.

Director, BioFrontiers Advanced Imaging Resource 2013 – 2014
BioFrontiers Institute, University of Colorado, Boulder, CO, USA.

Established first campus-wide microscopy facility and expanded user base expanded to over 100 users from eight departments, two universities, and two biotechnology firms. Led a collaborative team in the building and development of novel microscopy and super-resolution instrumentation and techniques; executed independent research; provided facility strategic vision; organized analytical training for users; worked with researchers to develop customized protocols and assays; collaborated with faculty to compete for grants and contracts to support facility research activities and lead infrastructure grants; interfaced and worked closely with industrial users. Directly reported to the Chief Scientific Officer, Dr. Leslie Leinwand, and Dr. Tom Cech.

Graduate Research Assistant, Palmer Laboratory. 2007 – 2013
Department of Biochemistry, University of Colorado, Boulder, CO, USA.

Investigated the role of site-specific mutations in dark-state conversion and irreversible photobleaching for red-fluorescent proteins; developed high-throughput microfluidic cell-sorter capable of measuring fluorescence lifetime and the rate of photobleaching on single mammalian cells; directed-evolution of red-fluorescent proteins for improved photostability; collaborated with other lab members on the development and evaluation of optical biosensors. Research conducted under the guidance of Drs. Amy E. Palmer and Ralph Jimenez.

Undergraduate Research Assistant, Williamson Laboratory. 2003 – 2006
Department of Chemistry, Willamette University, Salem, OR, USA.

Development of semi-automated laser light scattering instrumentation and the measurement of highly accurate and precise binary liquid-liquid phase diagrams. Research conducted under the guidance of Dr. J. Charles Williamson.

Patents & Patents Pending

13,360,706	Optically Integrated Microfluidic Cytometer for High Throughput Screening of Photophysical Properties of Cells or Particles.
62,155,980	Uniform and Scalable Light-Sheets Generated by Extended Focusing.
16,093,561	Light-Sheet Microscope with Parallelized 3D Image Acquisition.
63,688,197	Mechanically Sheared Axially Swept Light-Sheet Microscopy.

PUBLICATIONS

Peer-Reviewed Publications

1. Zhou FY, Marin Z, Yapp C, Zou Q, Nanes BA, Daetwyler S, Jamieson AR, Islam MT, Jenkins E, Gihana GM, Lin J, Borges HM, Chang BJ, Weems A, Morrison SJ, Sorger PK, Fiolka R, **Dean KM**, Danuser G. Universal consensus 3D segmentation of cells from 2D segmented stacks. Accepted, Nat Methods.
2. Isogai T, **Dean KM**, Roudot P, Azarova EV, Bhatt K, Driscoll MK, Royer SP, Mittal N, Chang BJ, Han SJ, Fiolka R, Danuser G. Direct Arp2/3-vinculin binding is required for pseudopod extension, but only on compliant substrates and in 3D. iScience. 2025 May 9;28(6):112623. doi: 10.1016/j.isci.2025.112623. PMID: 40502699; PMCID: PMC12152658.

3. Haug J, Galecki S, **Dean KM**[‡]. Altair-LSFM: A High-Resolution, Easy-to-Build Light-Sheet Microscope for Sub-Cellular Imaging. *eLife*. 2025 Jun;14. doi: 10.7554/eLife.106910.1.
4. Jeppesen DK, Sanchez ZC, Kelley NM, Hayes JB, Ambroise J, Koory EN, Krystofiak E, Taneja N, Zhang Q, Dungan MM, Perkins OL, Tyska MJ, Knapik EW, **Dean KM**, Doran AC, Coffey RJ, Burnette DT. Blebbisomes are large, organelle-rich extracellular vesicles with cell-like properties. *Nat Cell Biol*. 2025 Mar;27(3):438-448. doi: 10.1038/s41556-025-01621-0. Epub 2025 Feb 21. PMID: 39984653; PMCID: PMC11906356.
5. Marin Z, Wang X, Collison DW, McFadden C, Lin J, Borges HM, Chen B, Mehra D, Shen Q, Galecki S, Daetwyler S, Sheppard SJ, Thien P, Porter BA, Conzen SD, Shepherd DP, Fiolka R, **Dean KM**[‡]. Navigate: an open-source platform for smart light-sheet microscopy. *Nat Methods*. 2024 Nov;21(11):1967-1969. doi: 10.1038/s41592-024-02413-4. PMID: 39261640; PMCID: PMC11540721.
6. Mcfadden C, Marin Z, Chen B, Daetwyler S, Wang X, Rajendran D, **Dean KM**, Fiolka R. Adaptive optics in an oblique plane microscope. *Biomedical Optics Express*. 2024 July; 15(8):4498-. doi: 10.1364/BOE.524013.
7. Lin J, Mehra D, Marin Z, Wang X, Borges HM, Shen Q, Galecki S, Haug J, Abbott DH, **Dean KM**[‡]. Mechanically sheared axially swept light-sheet microscopy. *Biomed Opt Express*. 2024 Aug 19;15(9):5314-5327. doi: 10.1364/BOE.526145. PMID: 39296406; PMCID: PMC11407235.
8. Nanes BA, Bhatt K, Azarova E, Rajendran D, Munawar S, Isogai T, **Dean KM**, Danuser G. Shifts in keratin isoform expression activate motility signals during wound healing. *Dev Cell*. 2024 Oct 21;59(20):2759-2771.e11. doi: 10.1016/j.devcel.2024.06.011. Epub 2024 Jul 12. PMID: 39002537; PMCID: PMC11496015.
9. Driscoll MK, Welf ES, Weems A, Sapoznik E, Zhou F, Murali VS, García-Arcos JM, Roh-Johnson M, Piel M, **Dean KM**, Fiolka R, Danuser G. Proteolysis-free amoeboid migration of melanoma cells through crowded environments via bleb-driven worrying. *Dev Cell*. 2024 Sep 23;59(18):2414-2428.e8. doi: 10.1016/j.devcel.2024.05.024. Epub 2024 Jun 12. PMID: 38870943; PMCID: PMC11421976.
10. Ju RJ, Falconer AD, Schmidt CJ, Enriquez Martinez MA, **Dean KM**, Fiolka RP, Sester DP, Nobis M, Timpson P, Lomakin AJ, Danuser G, White MD, Haass NK, Oelz DB, Stehbens SJ. Compression-dependent microtubule reinforcement enables cells to navigate confined environments. *Nat Cell Biol*. 2024 Sep;26(9):1520-1534. doi: 10.1038/s41556-024-01476-x. Epub 2024 Aug 19. PMID: 39160291.
11. Xie P, Xie X, Ye C, **Dean KM**, Laothamatas I, Taufique SKT, Takahashi J, Yamazaki S, Xu Y, Liu Y. Mammalian circadian clock proteins form dynamic interacting microbodies distinct from phase separation. *Proc Natl Acad Sci U S A*. 2023 Dec 26;120(52):e2318274120. doi: 10.1073/pnas.2318274120. Epub 2023 Dec 21. PMID: 38127982; PMCID: PMC10756265.
12. Roudot P, Legant WR, Zou Q, **Dean KM**, Isogai T, Welf ES, David AF, Gerlich DW, Fiolka R, Betzig E, Danuser G. u-track3D: Measuring, navigating, and validating dense particle trajectories in three dimensions. *Cell Rep Methods*. 2023 Dec 18;3(12):100655. doi: 10.1016/j.crmeth.2023.100655. Epub 2023 Dec 1. PMID: 38042149; PMCID: PMC10783629.
13. Cheikh MI, Tchoufag J, Osterfield M, **Dean KM**, Bhaduri S, Zhang C, Mandadapu KK, Doubrovinski K. A comprehensive model of Drosophila epithelium reveals the role of embryo geometry and cell topology in mechanical responses. *Elife*. 2023 Oct 2;12:e85569. doi: 10.7554/eLife.85569. PMID: 37782009; PMCID: PMC10584372.
14. Weems AD, Welf ES, Driscoll MK, Zhou FY, Mazloom-Farsibaf H, Chang BJ, Murali VS, Gihana GM, Weiss BG, Chi J, Rajendran D, **Dean KM**, Fiolka R, Danuser G. Blebs promote cell survival by assembling oncogenic signalling hubs. *Nature*. 2023 Mar;615(7952):517-525. doi: 10.1038/s41586-023-05758-6. Epub 2023 Mar 1. PMID: 36859545; PMCID: PMC10881276.
15. Pagani CA, Bancroft AC, Tower RJ, Livingston N, Sun Y, Hong JY, Kent RN 3rd, Strong AL, Nunez JH, Medrano JMR, Patel N, Nanes BA, **Dean KM**, Li Z, Ge C, Baker BM, James AW, Weiss SJ, Franceschi RT, Levi B. Discoidin domain receptor 2 regulates aberrant mesenchymal lineage cell fate and matrix organization. *Sci Adv*. 2022 Dec 21;8(51):eabq6152. doi: 10.1126/sciadv.abq6152. Epub 2022 Dec 21. PMID: 36542719; PMCID: PMC9770942.

16. Chen B, Chang BJ, Zhou FY, Daetwyler S, Sapoznik E, Nanes BA, Terrazas I, Gihana GM, Castro LP, Chan IS, Conacci-Sorrell M, **Dean KM**, Millett-Sikking A, York AG, Fiolka R. Increasing the field-of-view in oblique plane microscopy via optical tiling. *Biomed Opt Express*. 2022 Oct 4;13(11):5616-5627. doi: 10.1364/BOE.467969. PMID: 36733723; PMCID: PMC9872888.
17. Chen B, Chang BJ, Roudot P, Zhou F, Sapoznik E, Marlar-Pavey M, Hayes JB, Brown PT, Zeng CW, Lambert T, Friedman JR, Zhang CL, Burnette DT, Shepherd DP, **Dean KM**, Fiolka RP. Resolution doubling in light-sheet microscopy via oblique plane structured illumination. *Nat Methods*. 2022 Nov;19(11):1419-1426. doi: 10.1038/s41592-022-01635-8. Epub 2022 Oct 24. PMID: 36280718; PMCID: PMC10182454.
18. **Dean KM**[‡], Chakraborty T, Daetwyler S, Lin J, Garrelts G, M'Saad O, Mekbib HT, Voigt FF, Schaettin M, Stoeckli ET, Helmchen F, Bewersdorf J, Fiolka R. Isotropic imaging across spatial scales with axially swept light-sheet microscopy. *Nat Protoc*. 2022 Sep;17(9):2025-2053. doi: 10.1038/s41596-022-00706-6. Epub 2022 Jul 13. PMID: 35831614; PMCID: PMC10111370.
19. Haarman SE, Kim SY, Isogai T, **Dean KM**, Han SJ. Particle retracking algorithm capable of quantifying large, local matrix deformation for traction force microscopy. *PLoS One*. 2022 Jun 22;17(6):e0268614. doi: 10.1371/journal.pone.0268614. PMID: 35731725; PMCID: PMC9216574.
20. Pop IV, Espinosa F, Blevins CJ, Okafor PC, Ogujiofor OW, Goyal M, Mona B, Landy MA, **Dean KM**, Gurumurthy CB, Lai HC. Structure of Long-Range Direct and Indirect Spinocerebellar Pathways as Well as Local Spinal Circuits Mediating Proprioception. *J Neurosci*. 2022 Jan 26;42(4):581-600. doi: 10.1523/JNEUROSCI.2157-20.2021. Epub 2021 Dec 2. PMID: 34857649; PMCID: PMC8805613.
21. Liu H, Hiremath C, Patterson Q, Vora S, Shang Z, Jamieson AR, Fiolka R, **Dean KM**, Dellinger MT, Marciano DK. Heterozygous Mutation of Vegfr3 Reduces Renal Lymphatics without Renal Dysfunction. *J Am Soc Nephrol*. 2021 Dec 1;32(12):3099-3113. doi: 10.1681/ASN.2021010061. Epub 2021 Dec 1. PMID: 34551997; PMCID: PMC8638391.
22. Chang BJ, Manton JD, Sapoznik E, Pohlkamp T, Terrones TS, Welf ES, Murali VS, Roudot P, Hake K, Whitehead L, York AG, **Dean KM**, Fiolka R. Real-time multi-angle projection imaging of biological dynamics. *Nat Methods*. 2021 Jul;18(7):829-834. doi: 10.1038/s41592-021-01175-7. Epub 2021 Jun 28. PMID: 34183831; PMCID: PMC9206531.
23. Han SJ, Azarova EV, Whitewood AJ, Bachir A, Guttierrez E, Groisman A, Horwitz AR, Goult BT, **Dean KM**[‡], Danuser G. Pre-complexation of talin and vinculin without tension is required for efficient nascent adhesion maturation. *Elife*. 2021 Mar 30;10:e66151. doi: 10.7554/eLife.66151. PMID: 33783351; PMCID: PMC8009661.
24. Welf ES, Miles CE, Huh J, Sapoznik E, Chi J, Driscoll MK, Isogai T, Noh J, Weems AD, Pohlkamp T, **Dean KM**, Fiolka R, Mogilner A, Danuser G. Actin-Membrane Release Initiates Cell Protrusions. *Dev Cell*. 2020 Dec 21;55(6):723-736.e8. doi: 10.1016/j.devcel.2020.11.024. Epub 2020 Dec 11. PMID: 33308479; PMCID: PMC7908823.
25. Sapoznik E, Chang BJ, Huh J, Ju RJ, Azarova EV, Pohlkamp T, Welf ES, Broadbent D, Carisey AF, Stehbens SJ, Lee KM, Marín A, Hanker AB, Schmidt JC, Arteaga CL, Yang B, Kobayashi Y, Tata PR, Kruithoff R, Doubrovinski K, Shepherd DP, Millett-Sikking A, York AG, **Dean KM**[‡], Fiolka RP. A versatile oblique plane microscope for large-scale and high-resolution imaging of subcellular dynamics. *Elife*. 2020 Nov 12;9:e57681. doi: 10.7554/eLife.57681. PMID: 33179596; PMCID: PMC7707824.
26. Lee KM, Guerrero-Zotano AL, Servetto A, Sudhan DR, Lin CC, Formisano L, Jansen VM, González-Ericsson P, Sanders ME, Stricker TP, Raj G, **Dean KM**, Fiolka R, Cantley LC, Hanker AB, Arteaga CL. Proline rich 11 (PRR11) overexpression amplifies PI3K signaling and promotes antiestrogen resistance in breast cancer. *Nat Commun*. 2020 Oct 30;11(1):5488. doi: 10.1038/s41467-020-19291-x. PMID: 33127913; PMCID: PMC7599336.
27. Chakraborty T, Chen B, Daetwyler S, Chang BJ, Vanderpoorten O, Sapoznik E, Kaminski CF, Knowles TPJ, **Dean KM**, Fiolka R. Converting lateral scanning into axial focusing to speed up three-dimensional microscopy. *Light Sci Appl*. 2020 Sep 18;9:165. doi: 10.1038/s41377-020-00401-9. PMID: 33024553; PMCID: PMC7501866.

28. Chang BJ, **Dean KM**, Fiolka R. Systematic and quantitative comparison of lattice and Gaussian light-sheets. *Opt Express*. 2020 Aug 31;28(18):27052-27077. doi: 10.1364/OE.400164. PMID: 32906967; PMCID: PMC7679196.
29. Chen B, Chakraborty T, Daetwyler S, Manton JD, **Dean KM**, Fiolka R. Extended depth of focus multiphoton microscopy via incoherent pulse splitting. *Biomed Opt Express*. 2020 Jun 19;11(7):3830-3842. doi: 10.1364/BOE.393931. PMID: 33014569; PMCID: PMC7510929.
30. Chakraborty T, Driscoll MK, Jeffery E, Murphy MM, Roudot P, Chang BJ, Vora S, Wong WM, Nielson CD, Zhang H, Zhemkov V, Hiremath C, De La Cruz ED, Yi Y, Bezprozvanny I, Zhao H, Tomer R, Heintzmann R, Meeks JP, Marciano DK, Morrison SJ, Danuser G, **Dean KM**[†], Fiolka R. Light-sheet microscopy of cleared tissues with isotropic, subcellular resolution. *Nat Methods*. 2019 Nov;16(11):1109-1113. doi: 10.1038/s41592-019-0615-4. Epub 2019 Oct 31. PMID: 31673159; PMCID: PMC6924633.
31. Driscoll MK, Welf ES, Jamieson AR, **Dean KM**, Isogai T, Fiolka R, Danuser G. Robust and automated detection of subcellular morphological motifs in 3D microscopy images. *Nat Methods*. 2019 Oct;16(10):1037-1044. doi: 10.1038/s41592-019-0539-z. Epub 2019 Sep 9. PMID: 31501548; PMCID: PMC7238333.
32. Mohan AS, **Dean KM**, Isogai T, Kasitinon SY, Murali VS, Roudot P, Groisman A, Reed DK, Welf ES, Han SJ, Noh J, Danuser G. Enhanced Dendritic Actin Network Formation in Extended Lamellipodia Drives Proliferation in Growth-Challenged Rac1P29S Melanoma Cells. *Dev Cell*. 2019 May 6;49(3):444-460.e9. doi: 10.1016/j.devcel.2019.04.007. PMID: 31063759; PMCID: PMC6760970.
33. Chang BJ, Kittisopikul M, **Dean KM**, Roudot P, Welf ES, Fiolka R. Universal light-sheet generation with field synthesis. *Nat Methods*. 2019 Mar;16(3):235-238. doi: 10.1038/s41592-019-0327-9. Epub 2019 Feb 25. PMID: 30804550; PMCID: PMC6561754.
34. **Dean KM**, Fiolka R. Lossless Three-Dimensional Parallelization in Digitally Scanned Light-Sheet Fluorescence Microscopy. *Sci Rep*. 2017 Aug 24;7(1):9332. doi: 10.1038/s41598-017-08113-8. PMID: 28839150; PMCID: PMC5570909.
35. **Dean KM**, Roudot P, Welf ES, Pohlkamp T, Garrelts G, Herz J, Fiolka R. Imaging Subcellular Dynamics with Fast and Light-Efficient Volumetrically Parallelized Microscopy. *Optica*. 2017 Feb 20;4(2):263-271. doi: 10.1364/OPTICA.4.000263. PMID: 28944279; PMCID: PMC5609504.
36. Chu J, Oh Y, Sens A, Ataie N, Dana H, Macklin JJ, Laviv T, Welf ES, **Dean KM**, Zhang F, Kim BB, Tang CT, Hu M, Baird MA, Davidson MW, Kay MA, Fiolka R, Yasuda R, Kim DS, Ng HL, Lin MZ. A bright cyan-excitable orange fluorescent protein facilitates dual-emission microscopy and enhances bioluminescence imaging in vivo. *Nat Biotechnol*. 2016 Jul;34(7):760-7. doi: 10.1038/nbt.3550. Epub 2016 May 30. PMID: 27240196; PMCID: PMC4942401.
37. Williamson JC, Brown AM, Helvie EN, **Dean KM**. Determination of liquid-liquid critical point composition using 90° laser light scattering. *Phys Rev E*. 2016 Apr;93:042610. doi: 10.1103/PhysRevE.93.042610. Epub 2016 Apr 21. PMID: 27176355.
38. **Dean KM**, Roudot P, Reis CR, Welf ES, Mettlen M, Fiolka R. Diagonally Scanned Light-Sheet Microscopy for Fast Volumetric Imaging of Adherent Cells. *Biophys J*. 2016 Mar 29;110(6):1456-65. doi: 10.1016/j.bpj.2016.01.029. PMID: 27028654; PMCID: PMC4816690.
39. Welf ES, Driscoll MK, **Dean KM**, Schäfer C, Chu J, Davidson MW, Lin MZ, Danuser G, Fiolka R. Quantitative Multiscale Cell Imaging in Controlled 3D Microenvironments. *Dev Cell*. 2016 Feb 22;36(4):462-75. doi: 10.1016/j.devcel.2016.01.022. PMID: 26906741; PMCID: PMC4784259.
40. **Dean KM**, Roudot P, Welf ES, Danuser G, Fiolka R. Deconvolution-free Subcellular Imaging with Axially Swept Light Sheet Microscopy. *Biophys J*. 2015 Jun 16;108(12):2807-15. doi: 10.1016/j.bpj.2015.05.013. PMID: 26083920; PMCID: PMC4472079.
41. **Dean KM**, Davis LM, Lubbeck JL, Manna P, Friis P, Palmer AE, Jimenez R. High-speed multi-parameter photophysical analyses of fluorophore libraries. *Anal Chem*. 2015;87(10):5026-30. doi: 10.1021/acs.analchem.5b00607. Epub 2015 Apr 29. PMID: 25898152; PMCID: PMC4648346.

42. **Dean KM**, Lubbeck JL, Davis LM, Regmi CK, Chapagain PP, Gerstman BS, Jimenez R, Palmer AE. Microfluidics-based selection of red-fluorescent proteins with decreased rates of photobleaching. *Integr Biol (Camb)*. 2015 Feb;7(2):263-73. doi: 10.1039/c4ib00251b. PMID: 25477249; PMCID: PMC4323946.
43. **Dean KM**, Fiolka R. Uniform and scalable light-sheets generated by extended focusing. *Opt Express*. 2014 Oct 20;22(21):26141-52. doi: 10.1364/OE.22.026141. PMID: 25401646.
44. **Dean KM**, Palmer AE. Advances in fluorescence labeling strategies for dynamic cellular imaging. *Nat Chem Biol*. 2014 Jul;10(7):512-23. doi: 10.1038/nchembio.1556. PMID: 24937069; PMCID: PMC4248787.
45. Qin Y, Miranda JG, Stoddard CI, **Dean KM**, Galati DF, Palmer AE. Direct comparison of a genetically encoded sensor and small molecule indicator: implications for quantification of cytosolic Zn(2+). *ACS Chem Biol*. 2013 Nov 15;8(11):2366-71. doi: 10.1021/cb4003859. Epub 2013 Sep 3. PMID: 23992616; PMCID: PMC4022295.
46. Davis LM, Lubbeck JL, **Dean KM**, Palmer AE, Jimenez R. Microfluidic cell sorter for use in developing red fluorescent proteins with improved photostability. *Lab Chip*. 2013 Jun 21;13(12):2320-7. doi: 10.1039/c3lc50191d. Epub 2013 May 2. PMID: 23636097; PMCID: PMC4047792.
47. **Dean KM**, Qin Y, Palmer AE. Visualizing metal ions in cells: an overview of analytical techniques, approaches, and probes. *Biochim Biophys Acta*. 2012 Sep;1823(9):1406-15. doi: 10.1016/j.bbamcr.2012.04.001. Epub 2012 Apr 13. PMID: 22521452; PMCID: PMC3408866.
48. Lubbeck JL, **Dean KM**, Ma H, Palmer AE, Jimenez R. Microfluidic flow cytometer for quantifying photobleaching of fluorescent proteins in cells. *Anal Chem*. 2012 May 1;84(9):3929-37. doi: 10.1021/ac202825z. Epub 2012 Apr 9. PMID: 22424298; PMCID: PMC3341488.
49. **Dean KM**, Lubbeck JL, Binder JK, Schwall LR, Jimenez R, Palmer AE. Analysis of red-fluorescent proteins provides insight into dark-state conversion and photodegradation. *Biophys J*. 2011 Aug 17;101(4):961-9. doi: 10.1016/j.bpj.2011.06.055. PMID: 21843488; PMCID: PMC3175071.
50. **Dean KM**, Williamson JC. The Stir-Settle Approach to Semiautomated Light Scattering Determination of Liquid-Liquid Coexistence Curves. *J. Chem. Eng. Data*. 2011 Jan 26;56(4):1433-7. doi: 10.1021/jel101143g.
51. **Dean KM**, Babayco CB, Sluss DR, Williamson JC. The accuracy of liquid-liquid phase transition temperatures determined from semiautomated light scattering measurements. *J Chem Phys*. 2010 Aug 21;133(7):074506. doi: 10.1063/1.3469778. PMID: 20726651.

Manuscripts in Review

1. Lin J, Marin Z, Wang X, Borges HM, N'Guetta PEY, Luo X, Porter BA, Xue Y, Islam MT, Ngo T, Aurora AB, Zhao H, Conzen SD, Morrison SJ, Liang S, Zhong Z, O'Brien LL, **Dean KM**[‡]. Feature-Driven Whole-Tissue Imaging with Subcellular Resolution.

Conference Papers

1. Marin Z, Wang X, Lin J, Borges H, Collison D, **Dean KM**[‡]. Autonomous Multiscale Axially Swept Light-Sheet Microscopy. *Microscopy and Microanalysis*. 2023.
2. Borges H, Lin J, Marin Z, **Dean KM**[‡]. Quantitative Cleared Tissue Imaging. *Microscopy and Microanalysis*. 2023.
3. **Dean KM**, Davis LM, Lubbeck JL, Manna P, Palmer AE, Jimenez R. Microfluidic flow cytometer for multiparameter screening of fluorophore photophysics. *Conference on Lasers and Electro-Optics (CLEO) - Laser Science to Photonic Applications*. 2014.

Book Chapters

1. Borges HM, Haug J, Lin J, Calvache S, Zhou FY, Luo X, Pop IV, Zhong Z, Liang S, Lai HC, **Dean KM[‡]**. Advanced Tissue Clearing and Axially Swept Light-Sheet Microscopy for High-Resolution Imaging of Neural Systems. *Neuromethods*. Springer Protocols.

[‡] Corresponding Author.

PRESENTATIONS

Invited Talks

1. Photonics Media Webinar Series. Virtual. 2025.
2. Stowers Institute for Medical Research, Kansas City, MO, USA, 2025.
3. University of Oklahoma, Norman, OK, USA, 2025.
4. Advances in Optics for Biotechnology, Medicine and Surgery XVIII, Cork, Ireland, UK, 2025.
5. University of California San Diego, San Diego, CA, USA, 2025.
6. University of Minnesota, Minneapolis, MN, USA, 2025.
7. University of Wisconsin, Madison, WI, USA, 2024.
8. Light Microscopy Australia. Melbourne, VIC, Australia, 2024.
9. Microscopy & Microanalysis. Minneapolis, MN, USA, 2023.
10. EMBL-Janelia Bioimaging Seminar Series. Virtual. 2023.
11. MC2 Image Analysis Working Group. Virtual. 2023.
12. Willamette University. Salem, OR, USA. 2023.
13. Photonics Media Webinar Series. Virtual. 2022.
14. CLEO: Laser Science to Photonic Applications Technical Conference. San Jose, CA, USA. 2022.
15. Light-Sheet Conference and Workshop, MBL. Woods Hole, MA, USA. 2022.
16. IQ Health Science & Engineering, Michigan State University. Lansing, MI, USA. 2021.
17. Photonics Media Webinar Series. Virtual. 2020.
18. Imaging ONE WORLD Series. Virtual. 2020.
19. Next Generation Microscopy Workshop. Cambridge, U.K. 2019.
20. Cell Biology Seminar Series, Denver University, Denver, CO, USA. 2017.
21. Andor Academy, University of Colorado, Boulder, CO, USA. 2014.

Contributed Talks

1. EPFL Latsis Symposium 2024. Lausanne, Switzerland. 2024.
2. American Society for Cell Biology (ASCB). Virtual. 2021.
3. Society for Neuroscience (SfN). Virtual. 2021.
4. EMBO & EMBL Symposium: Seeing is Believing - Imaging the Processes of Life. EMBL, Virtual. 2021.
5. Focus On Microscopy. Virtual. 2021.
6. Arizona Imaging and Microanalysis Conference. Virtual. 2021.
7. The Network of European Bioimage Analysts (NEUBIAS). Bordeaux, France. 2020.
8. Imaging Mouse Development. Howard Hughes Medical Institute. Ashburn, VA, USA. 2020.
9. Focus On Microscopy. Osaka, Japan. *Cancelled*. 2020.

10. The Academy of Medicine, Engineering & Science of Texas (TAMEST). Dallas, TX, USA. 2020.
11. American Chemical Society, Orlando, FL, USA. 2019.
12. EMBO & EMBL Symposium: Seeing is Believing - Imaging the Processes of Life. EMBL, Heidelberg, Germany. 2019.
13. Frontiers and Challenges in Laser-Based Biological Microscopy. Telluride, CO, USA. 2019.
14. Focus On Microscopy. London, U.K. 2018.
15. Focus On Microscopy. Singapore, Republic of Singapore. 2018.
16. Frontiers in Imaging Science. Howard Hughes Medical Institute. Ashburn, VA, USA. 2017.
17. Biophysical Society. New Orleans, LA, USA. 2017.
18. Quantitative BioImaging 2017. College Station, TX, USA. 2017.
19. Gordon Research Conference - Signaling by Adhesion Receptors. Bates College, Lewiston, Maine, USA. 2016.
20. EMBO & EMBL Symposium: Seeing is Believing - Imaging the Processes of Life. EMBL, Heidelberg, Germany. 2015.
21. EMBO & EMBL Symposium: Seeing is Believing - Imaging the Processes of Life. EMBL, Heidelberg, Germany. 2013.
22. Signaling and Cellular Regulation Symposium. University of Colorado, Boulder, CO, USA. 2013.
23. Computational, Optical, Sensing and Imaging. University of Colorado, Boulder, CO, USA. 2013.
24. Computational Optical, Sensing and Imaging IAB Meeting. Breckenridge, CO, USA. 2012.
25. Colorado Photonics Industry Association Annual Meeting. Boulder, CO, USA. 2011.
26. Molecular and Cellular Biophysics Symposium at the University of Denver. Denver, CO, USA. 2011.
27. Multiphoton Imaging: The Next 6×10^{23} Femtoseconds, Howard Hughes Medical Institute. Ashburn, VA, USA. 2010.
28. New Optical Methods in Cell Physiology, Society of General Physiologists. Wood's Hole, MA, USA. 2010.
29. Novel Approaches to Bioimaging II, Howard Hughes Medical Institute. Ashburn, VA, USA. 2010.
30. Student Scholarship Recognition Day, Salem, OR, USA. 2006.
31. Northwest Undergraduate Science Research Conference at Oregon Health & Science University, Portland, OR, USA. 2006.
32. Student Scholarship Recognition Day, Salem, OR, USA. 2005.

GRANTS & FUNDING

Current Grant Support

- 2025 – 2030 Mechanisms and Consequences of PAX2 Inactivation in the Initiation of Endometrial Carcinogenesis
National Cancer Institute, NIH.
Co-I
- 2025 – 2030 Improving Focused Ultrasound Mediated Viral Gene Therapy Delivery.
National Institute of Mental Health, NIH.
Co-I

- 2024 – 2025 Novel Pharmacologic Strategies to Mitigate Post-Traumatic Extremity Complications
Trauma Research and Combat Casualty Care Collaborative
Co-I
- 2024 – 2025 Advanced 3D Microscopy for Early Cancer Detection and Tissue-Based Diagnosis.
Lyda Hill Philanthropies.
Co-PI
- 2024 – 2025 Mechanisms Underlying Lobular Breast Cancer Metastasis to Bone.
Charles Pak Family Cancer & Bone Initiative Research Grant.
Co-PI
- 2021 – 2026 UTSW-UNC Center for Cell Signaling Analysis.
National Institute of General Medical Sciences, NIH.
RM1GM145399
MPI
- 2021 – 2026 Imaging Mechanisms of Metastatic Tumor Formation in Situ
National Cancer Institute, NIH.
U54CA268072
MPI

Previous Grant Support

- 2023 – 2024 Illuminating the Molecular and Cellular Origins of Tissue Function in Health & Disease.
President's Research Council, UTSW.
PI
- 2023 – 2024 Next-Generation Histopathology Using Rapid Ultraviolet Photoacoustical Microscopy.
Harold C. Simmons Comprehensive Cancer Center, UTSW.
MPI
- 2022 – 2023 Mechanisms of Cell Rearrangements During Germband Extension in *D. Melanogaster*.
National Institute of Child Health and Human Development, NIH.
R21HD105189
Collaborator
- 2022 – 2023 Linking Function, Structure, and Molecular Identity of Lateral Habenula Neurons.
National Institute of Mental Health, NIH.
R34NS121873
Collaborator
- 2021 – 2026 UTSW Cancer Center Support Grant
National Cancer Institute, NIH.
P30CA142543
Key Personnel
- 2020 – 2025 Prune Belly Syndrome: Mechanisms of Filamin A Mutations.
National Institute of Diabetes and Digest and Kidney Diseases, NIH.
R01DK127589
Co-Investigator
- 2020 – 2024 Neuronal Signaling Mechanisms of Stress-Induced Anhedonia in the Lateral Habenula.
National Institute of Mental Health, NIH.
R01MH120131
Collaborator

- 2019 – 2020 Laser for Ultra-Deep Intravital Imaging.
National Institute of General Medical Sciences, NIH.
S10OD026722
Key Personnel
- 2016 – 2018 Symmetry breaking and polarization of cells in 3D environments.
National Institute of General Medical Sciences, NIH.
F32GM117793
Principal Investigator
- 2011 – 2013 Integrative Graduate Education and Research Trainee (IGERT)
Computational, Optical, Sensing and Imaging.
Division Of Graduate Education, NSF
0801680
Trainee
- 2009 – 2011 Interdisciplinary Predoctoral Training in Molecular Biophysics.
National Institute of General Medical Sciences, NIH.
T32GM065103
Trainee
- 2006 – 2007 Sigma Xi Undergraduate Research Fellowship.
Trainee

Trainee Grant Support

2023 Hazel Borges, Carl Storm Underrepresented Minority (CSURM) Fellowship.
2024 Derek Abbott, SCCC Translational Cancer Biology T32 Training Program.

SERVICE & LEADERSHIP

Leadership Positions

2007 – 2013 Sigma Alpha Epsilon - University of Colorado Advisor and Regional Director
2007 Coast 2 Coast 4 Kalan Memorial Bike Ride - Philanthropy Coordinator and Participant
2005 – 2006 Willamette University Football Team Captain

Institutional Committees

2024 – Present UT Southwestern Core Facilities Committee.
2022 – Present Molecular Biophysics Work-In-Progress Evaluator.
2022 – Present UT Southwestern Committee on Improving Research Staff Recruitment and Hiring.
2022 – Present Lyda Hill Dept. of Bioinformatics and BME-Computational Biology Retreat.
2022 – Present UT Southwestern Graduate School Admissions Committee.
2021 – Present Dept. of Biophysics and Lyda Hill Dept. of Bioinformatics Faculty Search.
2021 – Present Faculty Senate at UT Southwestern.
2021 – Present UT Southwestern Medical School Admissions Committee.

Conference Organizing

2023 CLEO: Laser Science to Photonic Applications Technical Conference.
2022 Biomedical Applications Program. OSA Biophotonics Congress.
2022 BRAIN Technical Program Committee. OSA Biophotonics Congress.

Advisory Panels

2021 - Present Beckman Center for Advanced Light Sheet Microscopy and Data Science,
University of Colorado BioFrontiers Institute.

Philanthropy & Community Service

2020 Neonatal Support Staff, Parkland Neonatal Intensive Care Unit
2020 Science Advocate, Science Policy, Education, and Communication club (SPEaC)
2019 Neonatal Support Staff, Parkland Neonatal Intensive Care Unit
2019 Science Advocate, Science Policy, Education, and Communication club (SPEaC)
2018 Neonatal Support Staff, Parkland Neonatal Intensive Care Unit
2018 Science Advocate, Science Policy, Education, and Communication club (SPEaC)
2017 Neonatal Support Staff, Parkland Neonatal Intensive Care Unit
2016 Science Advocate, Science Policy, Education, and Communication club (SPEaC)
2016 Neonatal Support Staff, Parkland Neonatal Intensive Care Unit
2015 Science Advocate, Science Policy, Education, and Communication club (SPEaC)
2006 Participant and Organizer, Coast to Coast for Kalan Memorial Bicycle Ride
2004 Participant, United Way Day of Caring
2004 Participant, Willamette University Bearcat Day Student Athlete Youth Outreach
2002 Participant, Habitat for Humanity

TEACHING & MENTORSHIP

Teaching Experience

2025 Course Director, Introduction to Python Software Development on GitHub, UTSW.
2025 Discussion Group Leader, Responsible Conduct of Research, UTSW.
2024 Course Director, Introduction to Python, UTSW.
2024 Lecturer, Optical Imaging and Probe Engineering, UTSW.
2023 Course Director, Introduction to Python Software Development on GitHub, UTSW.
2022 Discussion Group Leader, Responsible Conduct of Research, UTSW.
2022 Assistant Instructor, Computational Image Analysis, UTSW.
2021 Assistant Instructor, Computational Image Analysis, UTSW.
2018 Assistant Instructor, Optical Microscopy, UTSW.
2017 Assistant Instructor, Optical Microscopy, UTSW.
2016 Assistant Instructor, Optical Microscopy, UTSW.
2015 Assistant Instructor, Optical Microscopy, UTSW.
2013 Laboratory Assistant, Light Microscopy, University of Colorado.
2007 Teaching Assistant, Introductory Chemistry, University of Colorado.
2006 Tutor, Introductory Chemistry and Physical Chemistry, Willamette University.

Scientific Mentorship

High-School Students

2021 – 2022 Samir Mamtani, Undergraduate Student, University of Wisconsin.
2021 – 2022 Sampath Rapuri, Undergraduate Student, Johns Hopkins University.
2021 – 2022 Renil Gupta, High-School Student, St. Marks H.S.
2019 – 2019 Ryan Hammond, Undergraduate Student, Carnegie Mellon University.

Undergraduate Students

2024 – 2025 Daniel Buckelew, Undergraduate Student, UTD.
2024 – 2025 Easha Syed, Undergraduate Student, UTD.
2024 – 2025 Joel Augustine, Undergraduate Student, UTD.
2024 – 2025 Kay Lin, Undergraduate Student, UTD.

2024 – 2025	Victoria Daniel Buckelew Syed, Undergraduate Student, UTD.
2023 – 2024	Sai Bommisetty, Graduate Student, ETH Zurich.
2023 – 2024	Joy Camposagrado, Clinical Trial Recruiter, SGS.
2023 – 2024	James Harrigan, Flight Test Engineer, United States Air Force.
2023 – 2024	Rayyan Sappayani, Aerostructures Test Engineer, Shield AI.
2023 – 2024	Abhijeet Kulkarni, Undergraduate Student, UT Dallas.
2023 – 2024	Besher Nusair, Mechanical Engineer, Alpine ITW.
2023 – 2024	Cammy Kutter, Undergraduate Student, UCLA.
2023 – 2023	Evan Wylie, Graduate Student, University of Oregon.
2012 – 2013	Jordan Gringauz, Legal Associate, Finnegan.
2011 – 2013	Derek Gann, Senior Devices Engineer, Heirloom.
2010 – 2011	Jennifer Binder, Graduate Student, Arizona State University.

Graduate Students

2023 – Present	Seweryn Galecki, M.S., Fulbright Graduate Student.
2023 – 2023	Calvin Jones, Graduate Research Assistant, Boise State University.
2011 – 2013	Pramashis Manna, Assistant Professor, Ohio State University.

Postdoctoral Fellows

2024 – Present	Derek Abbott, Ph.D., UT Southwestern Medical Center.
2023 – Present	Qionghua Shen, Ph.D., UT Southwestern Medical Center.
2023 – Present	John Haug, Ph.D., UT Southwestern Medical Center.
2023 – 2025	Dushyant Mehra, Ph.D., UT Southwestern Medical Center.
2022 – 2023	Zach Marin, Ph.D., Postdoctoral Fellow, Max Perutz Labs Vienna.
2018 – 2019	Qiuyan Shao, Principal Data Scientist at Capital One.

Staff Scientists

2022 – Present	Xiaoding 'Annie' Wang, M.S., Software Engineer, UT Southwestern Medical Center.
2021 – Present	Jinlong Lin, Research Technician I, UT Southwestern Medical Center.
2021 – Present	Hazel Borges, M.S., Research Assistant I, UT Southwestern Medical Center.
2024 – 2025	Doreen Idonije, Research Technician II, UT Southwestern Medical Center.
2023 – 2025	Samantha Calvache, Research Technician II, UT Southwestern Medical Center.
2022 – 2023	Melissa Glidewell, Territory Manager, 89 North.
2021 – 2023	Dax Collision, Software Engineer, Atmos Energy.
2019 – 2021	Evgenia Azarova, Graduate Student, Johns Hopkins University.
2018 – 2020	Saumya Vora, M.S., Regulatory Affairs Specialist, Medtronic.
2017 – 2019	Justin Cillay, M.D., Resident Physician, University of Colorado.
2012 – 2014	Pia Friis, Laboratory Technician in Clinical Microbiomics.

Dissertation Committees

2024 – Present	Eunice Song, Siegwart Lab, Dept. of Biomedical Engineering, UTSW.
2024 – Present	Kiddist Yihunie, Yao Lab, Dept. of Immunology, UTSW.
2020 – Present	Harshida Pancholi, Roberts Lab, Dept. of Neuroscience, UTSW.
2020 – 2022	Byron Weiss, Danuser Lab, Lyda Hill Dept. of Bioinformatics, UTSW.

PROFESSIONAL ENGAGEMENT

Study Sections

2025	National Institutes of Health, NIA SBIR/STTR Special Emphasis Panel.
2024	National Institutes of Health, Special Emphasis Panel.
2024	National Institutes of Health, Small Businesses Panel.
2023	National Institutes of Health, MOSAIC K99/R00 Special Emphasis Panel.
2023	National Institutes of Health, Neurotech. and Vision Review Special Emphasis Panel.
2022	National Institutes of Health, Neurotech. and Vision Review Special Emphasis Panel.
2022	Netherlands Organization for Scientific Research (NWO, the Dutch Research Council).
2019	Netherlands Organization for Scientific Research (NWO, the Dutch Research Council).

Editorial Boards

- Current Protocols

Referee for Journals

- Cell
- Nature Photonics
- Nature Methods
- Nature Protocols
- Nature Biotechnology
- Nature Scientific Data
- Scientific Reports
- Journal of Neuroscience Methods
- Optics Express
- Biomedical Optics Express
- Journal of Biophotonics
- Biophysical Journal
- PLoS One
- EMBO Molecular Systems Biology
- eLife
- The Journal of Cell Biology
- International Journal of Biochemistry and Cell Biology
- Laser & Photonics Reviews

Professional Memberships

American Society for Cell Biology
American Chemical Society
Biophysical Society
Society for Neuroscience

DISTINCTIONS

2023	Recipient, Distinguished Researcher Award from the UTSW President's Research Council
2022	Inductee, Weed High School Hall of Fame.
2018	Dean's Discretionary Award, UT Southwestern Medical Center.
2018	Runner-Up, UTSW Brown-Goldstein Excellence in Postdoctoral Research.
2016	Nominee, AAAS/Science Program for Excellence in Science.
2015	Finalist, 2015 Educational Award, Edmund Optics.
2011	Certificate of Achievement, Colorado Photonics Industry Association (CPIA).
2007	Excellence in Graduate Teaching.
2007	ESPN & CoSIDA District 8 Academic All-American.
2007	Inducted into National Football Foundation Hampshire Honor Society.
2007	Co-Recipient, Henry Booth Outstanding Senior Male Athlete Award.
2006	Willamette University Bill Trenbeath Award.
2006	ESPN & CoSIDA District 8 Academic All-American.
2006	Sigma Alpha Epsilon National Scholar.
2006	Willamette University Athlete of The Month.
2006	Northwest Conference Athlete of the Week.
2006	Willamette University Football Team Captain.
2005	Invited to Speak at the Murdock's NW Undergraduate Research Meeting.
2005	Willamette University Football Team Captain.
2005	Peterson Family Scholarship for Chemistry.
2005	Inducted into the Mortar Board National Honor Society.
2004	Sigma Alpha Epsilon National Scholar.
2004	Inducted into the National Society of Collegiate Scholars (NSCS).
2004	Selected for Science Collaborative Research Program.
2002	Haynes McHale Award.
2002	Neal Wade Award - Weed High School Outstanding Male Athlete of the Year.
2002	Inducted into California Scholarship Federation.