## **Jeffrey L Caplan, PhD**

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University of Delaware E.mail: jcaplan@udel.edu

**EDUCATION**

2008-2009 Postdoctoral Researcher, Department Mol., Cell. & Dev. Biology and Yale Center for Genomics and Proteomics, Yale University in New Haven, CT

2002-2008 PhD, Department Mol., Cell. & Dev. Biology, Yale University in New Haven, CT

1997-2002 BS, *Summa cum laude,* Horticulture, U. of Connecticut, Storrs, CT

1997-2001 BS, *Summa cum laude,* Mol. & Cell Biology, U. of Connecticut, Storrs, CT

**APPOINTMENTS**

2018-Present Associate Professor, Department of Plant and Soil Sciences, University of Delaware

2014-present Co-Director, Centralized Research Instrumentation Core, INBRE, University of Delaware

2013-present Director, Bio-Imaging Center, Delaware Biotechnology Institute, University of Delaware

2013-present Assistant Professor (secondary appt.), Department of Biological Sciences, University of Delaware

2009-2018 Research Assistant Professor (secondary appt.), Department of Plant and Soil Sciences, University of Delaware

2009-2013 Associate Director, Bio-Imaging Center, Delaware Biotechnology Institute, University of Delaware

**RESEARCH SUPPORT**

*Active*

2019-2024 P20, NIH-NIGMS INBRE, IDEA Network of Biomedical Research Excellence, PI Stanhope S, Role: **Co-Director** of Centralized Research Instrumentation Core

2019-2023 R01, NIH-NIGMS, Role of organelle dynamics and retrograde signaling during plant innate immunity. PI Dinesh-Kumar, Role: **m-PI**

2019-2022 DOE, Live-cell, quantum dot-based tracking of plant & microbial extracellular vesicles, Role: **PI**

2018-2023 R01, NIH-NIGMS, Molecular mechanism of Ca2+- induced mitochondrial shape transition in metazoans. PI Muniswamy, Role: **Key Personnel**

2018-2022 PGRP, NSF-IOS, The Role of Non-Coding RNA in the Modulation of Anther &

 Pollen Development in Grasses, PI Meyers B, Role: **co-PI**

2015-2021 P20, NIH-NIGMS COBRE, Center of Biomedical Research Excellence in Cardiovascular Health, PI Edwards D,Role: **Key personnel**

2018-2020 EAGER, NSF-IOS, RNA-PAINT as a method for high-throughput, quantitative, single molecule analysis of cellular RNAs, **PI**

2016-2020 R01, NIH-NIGMS, Flavoproteins in oxidative protein folding, PI Thorpe C, Role: **Key personnel**

*Completed*

2014-2019 P20, NIH-NIGMS INBRE, IDEA Network of Biomedical Research Excellence, PI Stanhope S, Role: **Co-Director** of Centralized Research Instrumentation Core.

2011-2018 R01, NIH-NIGMS, Study of chloroplast stromules during PCD and inter-organellar communication. PI Dinesh-Kumar. Role: **m-PI**

2018-2019 S10, NIH-NIGMS, Serial Block Face Scanning Electron Microscope, Role: **PI**

2016-2018 P20, NIH-NIGMS INBRE, Administrative Supplement, PI Stanhope S, Role: **Co-Investigator**

2014-2018 R01, NIH-NIGMS, Spectral revelations of mitochondrial Ca2+ flux interactome. PI: Madesh M, Role: **m-PI**

2011-2017 PGRP, NSF-IOS, Genetic and Histological Dissection of Phenotypic Variation in Quantitative Resistance to Maize Diseases. PI Wisser RJ, Role: **co-PI**

2015 S10, NIH-NIGMS, Zeiss LSM 710 Inverted Confocal Microscope, Role: **PI**

2012-2015 EAGER, NSF-MCB, In vivo localization of eukaryotic small RNAs, PI Meyers BC, Role: **co-PI**

2008-2015 COBRE, NIH-NCRR, Center for Biomedical Research Excellence, PI Lenhoff A, Role: **Key Personnel**

2012 Center for Advanced Technology (CAT), Engineering an anaerobic, low pH fluorescent protein for use in Clostridia cell cultures, Industry partner, Elcriton, Role: **PI**

*Pending*

2019 NSF IOS/PBI Plasmodesmata and chloroplasts in integrative defense signaling, PI Lee JY, Role **Co-PI**

**AWARDS AND HONORS**

2012 Research Summit Award, Delaware INBRE

2008 John Spangler Nicholas Prize, Outstanding thesis award, Department of Molecular, Cellular, and Developmental Biology, Yale University

2006 Poster prize, Department of Molecular, Cellular, and Developmental Biology, Yale University

1997-2001 Presidential Leadership Scholarship, University of Connecticut

**PUBLICATIONS**

*Peer-reviewed ( \* indicates corresponding)*

*2483 citations. 860 from first or corresponding author publications. H-index 27*

* + - 1. Formisano R, Mersha MD, **Caplan J**, Singh A, Rankin CH, Tavernarakis N, Dhillon HS. Synaptic vesicle fusion is modulated through feedback inhibition by dopamine auto-receptors. *Synapse*. 2020 Jan;74(1):e22131. Epub 2019 Sep 23. [10.1002/syn.22131](https://doi.org/10.1002/syn.22131)
			2. Sager R, Wang X, Hill K, Yoo BC, **Caplan J**, Nedo A, Tran T, Bennet M, Lee JY. Auxin-dependent control of a plasmodesmal regulator creates a negative feedback loop modulating lateral root emergence. Nat Commun. 2020;11(1):364. Published 2020 Jan 17. doi:10.1038/s41467-019-14226-7. [PMC6969147](http://www.ncbi.nlm.nih.gov/pmc/articles/pmc6969147/)
			3. Huang K, Baldrich P, Meyers BC, **Caplan JL**\*. sRNA‐FISH: versatile fluorescent in situ detection of small RNAs in plants. The Plant Journal. 2019;98(2):359-69.
			4. Kimmelmann-Shultz B, Mohmammadmirzaei N, **Caplan J**, Knox D. Using Near-infrared Fluorescence and High-resolution Scanning to Measure Protein Expression in the Rodent Brain. JoVE (Journal of Visualized Experiments). 2019(147):e59685. DOI: [10.3791/59685](https://doi.org/10.3791/59685)
			5. Liu Y, Kolagunda A, Treible W, Nedo A, **Caplan J**, Kambhamettu C, editors. Intersection to Overpass: Instance Segmentation on Filamentous Structures With an Orientation-Aware Neural Network and Terminus Pairing Algorithm. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops; 2019. [Link to PDF](http://www.udel.edu/006925).
			6. Pike CM, Boyer-Andersen R, Kinch LN, **Caplan JL**, Neunuebel MR. The Legionella effector RavD binds phosphatidylinositol-3-phosphate and helps suppress endolysosomal maturation of the Legionella-containing vacuole. Journal of Biological Chemistry. 2019;294(16):6405-15.
			7. Safa BN, Peloquin JM, Natriello JR, **Caplan JL**, Elliott DM. Helical fibrillar microstructure of tendon using serial block-face scanning electron microscopy and a mechanical model for interfibrillar load transfer. Journal of the Royal Society Interface. 2019;16(160):20190547. PMCID: [PMC6893486](http://www.ncbi.nlm.nih.gov/pmc/articles/pmc6893486/)
			8. Tomar D, Jaña F, Dong Z, Quinn III WJ, Jadiya P, Breves SL, Daw CC, Srikantan S, Shanmughapriya S, Nemani N, Carvalho E, Tripathi A, Worth AM, Zhang X, Razmpour R, Seelam A, Rhode S, Mehta AV, Murray M, Slade D, Ramirez SH, Mishra P, Gerhard GS, **Caplan J**, Norton L, Sharma K, Rajan S, Balciunas D, Wijesinghe DS, Ahima RS, Baur JA, Madesh M. Blockade of MCU-Mediated Ca2+ Uptake Perturbs Lipid Metabolism via PP4-Dependent AMPK Dephosphorylation. Cell reports. 2019;26(13):3709-25. e7. PMCID: [PMC6512325](http://www.ncbi.nlm.nih.gov/pmc/articles/pmc6512325/)
			9. Wu D, Sinha N, Lee J, Sutherland BP, Halaszynski NI, Tian Y, **Caplan J**, Zhang HV, Saven JG, Kloxin CJ, Pochan DJ. Polymers with controlled assembly and rigidity made with click-functional peptide bundles. Nature. 2019;574(7780):658-62. DOI: [10.1038/s41586-019-1683-4](https://doi.org/10.1038/s41586-019-1683-4)
			10. Cartier E, Garcia-Olivares J, Janezic E, Viana J, Moore M, Landon M, **Caplan JL**, Torres G, Kim Y-H, Dover D. The SUMO-conjugase Ubc9 prevents the degradation of the Dopamine Transporter, enhancing its cell surface level and dopamine uptake. Frontiers in Cellular Neuroscience. 2019;13:35. PMCID: [PMC6386010](http://www.ncbi.nlm.nih.gov/pmc/articles/pmc6386010/)
			11. Liu Y, Treible W, Kolagunda A, Nedo A, Saponaro P, **Caplan J,** Kambhamettu C, editors. Densely Connected Stacked U-network for Filament Segmentation in Microscopy Images. European Conference on Computer Vision; 2018: Springer, Cham.
			12. Park E, **Caplan JL\***, Dinesh-Kumar, SP\*. Dynamic coordination of plastid morphological change by cytoskeleton for chloroplast-nucleus communication during plant immune responses. Plant Signal Behav. 2018;13(8). doi: 10.1080/15592324.2018.1500064. PMID [30067472](https://www.ncbi.nlm.nih.gov/pubmed/30067472).
			13. Nemani N, Carvalho E, Tomar D, Dong Z, Ketschek A, Breves SL, Jana F, Worth AM, Heffler J, Palaniappan P, Tripathi A, Subbiah R, Riitano MF, Seelam A, Manfred T, Itoh K, Meng S, Sesaki H, Craigen WJ, Rajan S, Shanmughapriya S, **Caplan J**, Prosser BL, Gill DL, Stathopulos PB, Gallo G, Chan DC, Mishra P, Madesh M. MIRO-1 Determines Mitochondrial Shape Transition upon GPCR Activation and Ca(2+) Stress. Cell Rep. 2018;23(4):1005-19. Epub 2018/04/26. doi: 10.1016/j.celrep.2018.03.098. 29694881; PMCID: [PMC5973819](https://www.ncbi.nlm.nih.gov/pubmed/29694881).
			14. Yu X, Noll RR, Romero Dueñas BP, Allgood SC, Barker K, **Caplan JL**, Machner MP, LaBaer J, Qiu J, Neunuebel MR. Legionella effector AnkX interacts with host nuclear protein PLEKHN1. BMC Microbiol. 2018 Jan 5;18(1):5. doi: 10.1186/s12866-017-1147-7. PMID: 29433439.
			15. Hudson DA, **Caplan JL**, Thorpe C. Designing Flavoprotein-GFP Fusion Probes for Analyte-Specific Ratiometric Fluorescence Imaging. Biochemistry. 2018;57(7):1178-89. Epub 2018/01/18. doi: 10.1021/acs.biochem.7b01132. 29341594; PMCID: [PMC5820181](https://www.ncbi.nlm.nih.gov/pubmed/29341594).
			16. Park E, Nedo A, **Caplan JL\*,** Dinesh-Kumar SP\*. Plant-microbe interactions: organelles and the cytoskeleton in action. The New phytologist. 2018;217(3):1012-28. Epub 2017/12/19. doi: 10.1111/nph.14959. PubMed PMID: [29250789](https://www.ncbi.nlm.nih.gov/pubmed/29433439).
			17. Minker KR, Biedrzycki ML, Kolagunda A, Rhein S, Perina FJ, Jacobs SS, Moore M, Jamann TM, Yang Q, Nelson R, Balint-Kurti P, Kambhamettu C, Wisser RJ\*, **Caplan JL\***. 2018. Semiautomated confocal imaging of fungal pathogenesis on plants: Microscopic analysis of macroscopic specimens. Microsc Res Tech. PMID: [27342138](https://www.ncbi.nlm.nih.gov/pubmed/27342138).
			18. Kumar AS, Park E, Nedo A, Alqarni A, Ren L, Hoban K, Modla S, McDonald JH, Kambhamettu C, Dinesh-Kumar SP\*, and Caplan JL\*. Stromule extension along microtubules coordinated with actin-mediated anchoring guides perinuclear chloroplast movement during innate immunity. Elife. 2018 Jan 17;7. pii: e23625. doi: 10.7554/eLife.23625 PMCID: [PMC5815851](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5815851/).
			19. Park E, Nedo A, **Caplan JL\***, Dinesh-Kumar SP. Plant-microbe interactions: organelles and the cytoskeleton in action. New Phytol. 2017 Dec 18. Doi: 10.111/nph.14959. PMID [29250789](https://www.ncbi.nlm.nih.gov/pubmed/29250789).
			20. Huang K, Doyle F, Wurz ZE, Tenenbaum SA, Hammond RK, **Caplan JL\*,** Meyers BC\*. FASTmiR: an RNA-based sensor for in vitro quantification and live-cell localization of small RNAs. Nucleic Acids Res. 2017 Aug 21;45(14):e130. doi: 10.1093/nar/gkx504. PMID: [28586459](https://www.ncbi.nlm.nih.gov/pubmed/28586459).
			21. Yang Q, He Y, Kabahuma M, Chaya T, Kelly A, Borrego E, Bian Y, El Kasmi F, Yang L, Teixeira P, Kolkman J, Nelson R, Kolomiets M, L Dangl J, Wisser R, **Caplan J**, Li X, Lauter N, Balint-Kurti P. A gene encoding maize caffeoyl-CoA O-methyltransferase confers quantitative resistance to multiple pathogens. Nat Genet. 2017 Sep;49(9):1364-1372. doi: 10.1038/ng.3919. Epub 2017 Jul 24. PMID: [28740263](https://www.ncbi.nlm.nih.gov/pubmed/28740263).
			22. Liang H, DeMeester KE, Hou CW, Parent MA, **Caplan JL**, Grimes CL. Metabolic labelling of the carbohydrate core in bacterial peptidoglycan and its applications. Nat Commun. 2017 Apr 20;8:15015. doi: 10.1038/ncomms15015. PMID: [28425464](https://www.ncbi.nlm.nih.gov/pubmed/28425464).
			23. Pokrzywinski KL, Tilney CL, Modla S, **Caplan JL**, Ross J, Warner ME, Coyne KJ. Effects of the bacterial algicide IRI-160AA on cellular morphology of harmful dinoflagellates.Harmful Algae. 2017 Feb;62:127-135. doi: 10.1016/j.hal.2016.12.004. Epub 2017 Jan 16. PMID: [28118887](https://www.ncbi.nlm.nih.gov/pubmed/28118887).
			24. Lu G, Ren L, **Caplan J**, Kambhamettu C, stromule branch tip detection based on accurate cell image segmentation. IEEE SigPort, 2017. http://sigport.org/1807.
			25. Saponaro P, Treible W, Kolagunda A, Chaya T, **Caplan J**, Kambhamettu C, Wisser R. DeepXScope: Segmenting microscopy images with a deep neural network. CVPR. 2017. [Open access](http://openaccess.thecvf.com/content_cvpr_2017_workshops/w8/papers/Saponaro_DeepXScope_Segmenting_Microscopy_CVPR_2017_paper.pdf).
			26. Saponaro P, Treible W, Kolagunda A, Chaya T, **Caplan J**, Kambhamettu C, Wisser R. Three-dimensional segmentation of vesicular networks of fungal hyphae in macroscopic microscopy image stacks. ICIP. 2017. [arXiv:1704.02356](https://arxiv.org/abs/1704.02356).
			27. Dong Z, Shanmughapriya S, Tomar D, Siddiqui N, Lynch S, Nemani N, Breves SL, Zhang X, Tripathi A, Palaniappan P, Riitano MF, Worth AM, Seelam A, Carvalho E, Subbiah R, Jaña F, Soboloff J, Peng Y, Cheung JY, Joseph SK, **Caplan J**, Rajan S, Stathopulos PB, Madesh M. Mitochondrial Ca2+ Uniporter Is a Mitochondrial Luminal Redox Sensor that Augments MCU Channel Activity. Mol Cell. 2017 Mar 16;65(6):1014-1028.e7. doi 10.1016/j.molcel.2017.01.032. Epub 2017 Mar 2. PMID: [28262504](https://www.ncbi.nlm.nih.gov/pubmed/28262504).
			28. Black K, Petruk S, Fenstermaker TK, Hodgson JW, **Caplan JL**, Brock HW, Mazo A. Chromatin proteins and RNA are associated with DNA during all phases of mitosis. Cell Discov. 2016 Oct 25;2:16038. eCollection 2016. PMID: [27807477](https://www.ncbi.nlm.nih.gov/pubmed/27807477).
			29. Huang K, **Caplan J**, Sweigard J, Czymmek K, Donofrio N. 2016. Optimization of the HyPer sensor for robust real-time detection of hydrogen peroxide in the rice blast fungus. Mol Plant Pathol. Feb;18(2):298-307. PMID: [26950262](https://www.ncbi.nlm.nih.gov/pubmed/26950262).
			30. Tomar D, Dong Z, Shanmughapriya S, Koch DA, Thomas T, Hoffman NE, Timbalia SA, Goldman SJ, Breves SL, Corbally DP, Nemani N, Fairweather JP, Cutri AR, Zhang X, Song J, Jana F, Huang J, Barrero C, Rabinowitz JE, Luongo TS, Schumacher SM, Rockman ME, Dietrich A, Merali S, **Caplan J**, Stathopulos P, Ahima RS, Cheung JY, Houser SR, Koch WJ, Patel V, Gohil VM, Elrod JW, Rajan S, Madesh M. 2016. MCUR1 Is a Scaffold Factor for the MCU Complex Function and Promotes Mitochondrial Bioenergetics. Cell Rep 15(8): 1673-85. PMCID: [PMC4880542](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4880542/).
			31. Szczesny SE, **Caplan JL**, Pedersen P, Elliott DM. Quantification of Interfibrillar Shear Stress in Aligned Soft Collagenous Tissues via Notch Tension Testing. Sci Rep. 2015 Oct 15;5:14649. PMCID: [PMC4606738](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4606738/).
			32. **Caplan JL\***, Kumar AS, Park E, Padmanabhan MS, Hoban K, Modla S, Czymmek K, Dinesh-Kumar SP.\* (2015). Chloroplast Stromules Function during Innate Immunity. Dev Cell 34, 45–57. PMCID: [PMC4596411](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4596411/).
			* Cover article
			* Highlighted in Dong (2015) “Stromules: Signal Conduits for Plant Immunity.”, Dev Cell. 34, 3-4.
			* Editor’s Choice, VanHook (2015) “Immunity pipelines” Sci. Signal, 8,191
			* Global plant council “[2015 Plant Science Round UP](http://blog.globalplantcouncil.org/uncategorized/2015-plant-science-round-up/)” as **one of the year’s most groundbreaking.**
			1. Lai X, Price C, Modla S, Thompson WR, **Caplan J,** Kirn-Safran CB, Wang L. 2015. The dependences of osteocyte network on bone compartment, age, and disease. Bone Res 3. PMID: [26213632](https://www.ncbi.nlm.nih.gov/pubmed/26213632).
			2. Al-Dossary AA, Bathala P, **Caplan JL**, Martin-DeLeon PA. Oviductosome-Sperm Membrane Interaction in Cargo Delivery: Detection Of Fusion And Underlying Molecular Players Using Three-Dimensional Super-Resolution Structured Illumination Microscopy (Sr-SIM). J Biol Chem. 2015 Jul 17;290(29):17710-23. PMCID: [PMC4505020](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4505020/).
			3. Monillas ES, **Caplan JL**, Thévenin AF, Bahnson BJ. Oligomeric state regulated trafficking of human platelet-activating factor acetylhydrolase type-II. Biochim Biophys Acta. 2015 May;1854(5):469-75. PMCID: [PMC4380869](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4380869/).
			4. Gangadharan V, Nohe A, **Caplan J**, Czymmek K, Duncan RL. Caveolin-1 regulates P2X7 receptor signaling in osteoblasts. Am J Physiol Cell Physiol. 2015 Jan 1;308(1):C41-50. PMCID: [PMC4281673](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4281673/).
			5. Modla S, **Caplan JL**, Czymmek KJ, Lee JY. Localization of fluorescently tagged protein to plasmodesmata by correlative light and electron microscopy. Methods Mol Biol. 2015;1217:121-33. PubMed PMID: [25287200](http://www.ncbi.nlm.nih.gov/pubmed/25287200/).
			6. Warner CA, Biedrzycki ML, Jacobs SS, Wisser RJ, **Caplan JL**\*, Sherrier DJ\*. An optical clearing technique for plant tissues allowing deep imaging and compatible with fluorescence microscopy. Plant Physiol. 2014 Dec;166(4):1684-7. PMCID: [PMC4256880](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4256880/).
			7. Scheiblin DA, Gao J, **Caplan JL**, Simirskii VN, Czymmek KJ, Mathias RT, Duncan MK. Beta-1 integrin is important for the structural maintenance and homeostasis of differentiating fiber cells. Int J Biochem Cell Biol. 2014 May;50:132-45. PMCID: [PMC4067138](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4067138/).
			8. Naik MU, **Caplan JL**, Naik UP. Junctional adhesion molecule-A suppresses platelet integrin αIIbβ3 signaling by recruiting Csk to the integrin-c-Src complex. Blood. 2014 Feb 27;123(9):1393-402. PMCID: [PMC3938150](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3938150/).
			9. Mathioni SM, Patel N, Riddick B, Sweigard JA, Czymmek KJ, **Caplan JL**, Kunjeti SG, Kunjeti S, Raman V, Hillman BI, Kobayashi DY, Donofrio NM. Transcriptomics of the rice blast fungus Magnaporthe oryzae in response to the bacterial antagonist Lysobacter enzymogenes reveals candidate fungal defense response genes. PLoS One. 2013;8(10):e76487. PMCID: [PMC3789685](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3789685/).
			10. Lazouskaya V, Wang LP, Or D, Wang G, **Caplan JL**, Jin Y. Colloid mobilization by fluid displacement fronts in channels. J Colloid Interface Sci. 2013 Sep 15;406:44-50. PubMed PMID: [23800372](http://www.ncbi.nlm.nih.gov/pubmed/23800372/).
			11. Nandety RS, **Caplan JL**, Cavanaugh K, Perroud B, Wroblewski T, Michelmore RW, Meyers BC. The role of TIR-NBS and TIR-X proteins in plant basal defense responses. Plant Physiol. 2013 Jul;162(3):1459-72. PMCID: [PMC3707564](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3707564/)
			12. Lakshmanan V, Kitto SL, **Caplan JL**, Hsueh YH, Kearns DB, Wu YS, Bais HP. Microbe-associated molecular patterns-triggered root responses mediate beneficial rhizobacterial recruitment in Arabidopsis. Plant Physiol. 2012 Nov;160(3):1642-61. PubMed PMID: [22972705](http://www.ncbi.nlm.nih.gov/pubmed/22972705/); Pubmed PMCID: [PMC3486800](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3486800/).
			13. Kumar AS, Lakshmanan V, **Caplan JL,** Powell D, Czymmek KJ, Levia DF, Bais HP. Rhizobacteria Bacillus subtilis restricts foliar pathogen entry through stomata. Plant J. 2012 Nov;72(4):694-706. PubMed PMID: [22862801](http://www.ncbi.nlm.nih.gov/pubmed/22862801/).
			14. Wei D, Jacobs S, Modla S, Zhang S, Young CL, Cirino R, **Caplan J**, Czymmek K. High-resolution three-dimensional reconstruction of a whole yeast cell using focused-ion beam scanning electron microscopy. Biotechniques. 2012 Jul;53(1):41-8. PubMed PMID: [22780318](http://www.ncbi.nlm.nih.gov/pubmed/22780318/).
			15. Wang C, Fuller ME, Schaefer C, **Caplan JL,** Jin Y. Dissolution of explosive compounds TNT, RDX, and HMX under continuous flow conditions. J Hazard Mater. 2012 May 30;217-218:187-93. PubMed PMID: [22480704](http://www.ncbi.nlm.nih.gov/pubmed/22480704/).
			16. Young CL, Raden DL, **Caplan JL**, Czymmek KJ, Robinson AS. Cassette series designed for live-cell imaging of proteins and high-resolution techniques in yeast. Yeast. 2012 Mar;29(3-4):119-36. PMCID: [PMC3371369](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3371369/).
			17. Huang K, Czymmek KJ, **Caplan JL**, Sweigard JA, Donofrio NM. Suppression of plant-generated reactive oxygen species is required for successful infection by the rice blast fungus. Virulence. 2011 Nov-Dec;2(6):559-62. PubMed PMID: [21971181](http://www.ncbi.nlm.nih.gov/pubmed/21971181/).
			18. Wang C, Lazouskaya V, Fuller ME, **Caplan JL**, Schaefer CE, Jin Y. Dissolution of microscale energetic residues in saturated porous media: visualization and quantification at the pore-scale by spectral confocal microscopy. Environ Sci Technol. 2011 Oct 1;45(19):8352-8. PubMed PMID: [21861475](http://www.ncbi.nlm.nih.gov/pubmed/21861475/)
			19. **Caplan J**, Niethammer M, Taylor RM 2nd, Czymmek KJ. The power of correlative microscopy: multi-modal, multi-scale, multi-dimensional. Curr Opin Struct Biol. 2011 Oct;21(5):686-93. PMCID: [PMC3189301](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3189301/).
			20. Huang K, Czymmek KJ, **Caplan JL,** Sweigard JA, Donofrio NM. HYR1-mediated detoxification of reactive oxygen species is required for full virulence in the rice blast fungus. PLoS Pathog. 2011 Apr;7(4):e1001335. PMCID: [PMC3077360](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3077360/).
			21. **Caplan JL**, Zhu X, Mamillapalli P, Marathe R, Anandalakshmi R, Dinesh-Kumar SP. Induced ER chaperones regulate a receptor-like kinase to mediate antiviral innate immune response in plants. Cell Host Microbe. 2009 Nov 19;6(5):457-69. PMCID: [PMC2784700](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2784700/).
			22. **Caplan J**, Padmanabhan M, Dinesh-Kumar SP. Plant NB-LRR immune receptors: from recognition to transcriptional reprogramming. Cell Host Microbe. 2008 Mar 13;3(3):126-35. PubMed PMID: [18329612](http://www.ncbi.nlm.nih.gov/pubmed/18329612/).
			23. **Caplan JL,** Mamillapalli P, Burch-Smith TM, Czymmek K, Dinesh-Kumar SP. Chloroplastic protein NRIP1 mediates innate immune receptor recognition of a viral effector. Cell. 2008 Feb 8;132(3):449-62. PMCID: [PMC2267721](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2267721/).
			24. Burch-Smith TM, Schiff M, **Caplan JL**, Tsao J, Czymmek K, Dinesh-Kumar SP. A novel role for the TIR domain in association with pathogen-derived elicitors. PLoS Biol. 2007 Mar;5(3):e68. PMCID: [PMC1820829](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1820829/).
			25. Patel S, **Caplan J,** Dinesh-Kumar SP. Autophagy in the control of programmed cell death. Curr Opin Plant Biol. 2006 Aug;9(4):391-6. PubMed PMID: [16713731](http://www.ncbi.nlm.nih.gov/pubmed/16713731/).
			26. **Caplan J,** Dinesh-Kumar SP. Using viral vectors to silence endogenous genes. Curr Protoc Microbiol. 2006 Jun;Chapter 16:Unit 16I.6. PubMed PMID: [18770586](http://www.ncbi.nlm.nih.gov/pubmed/18770586/).
			27. Li X, Cordero I, **Caplan J,** Mølhøj M, Reiter WD. Molecular analysis of 10 coding regions from Arabidopsis that are homologous to the MUR3 xyloglucan galactosyltransferase. Plant Physiol. 2004 Mar;134(3):940-50. PMCID: [PMC389917](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC389917/).
			28. Madson M, Dunand C, Li X, Verma R, Vanzin GF, **Caplan J,** Shoue DA, Carpita NC, Reiter WD. The MUR3 gene of Arabidopsis encodes a xyloglucan galactosyltransferase that is evolutionarily related to animal exostosins. Plant Cell. 2003 Jul;15(7):1662-70. PMCID: [PMC165408](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC165408/).

**PRESENTATIONS**

*Plenary talk*

2020 “Live-cell, quantum dot-based tracking of plant & microbial extracellular vesicles”, Department of Energy 2020 BCIS Bioimaging Science Program Annual Principal Investigator (PI) Meeting, Washington DC

2017 “Stromule-directed chloroplast movement during plant immunity: does the tail wag the dog?”, Botanikertagung, Kiel Germany

*Invited talks*

2020 “Bioimaging and image analysis within biomedical research at UD and in the greater Delaware region”, Darwin Computing Symposium, University of Delaware

2019 “Stromule-guided chloroplast movement during plant innate immunity”, American Society of Plant Biology Regional Meeting, University of Maryland British Columbia

2019 “Delaware’s Bioimaging resources: imaging whole organisms to single molecules”, Delaware IDeA Symposium, University of Delaware

2019 “The DBI Bio-Imaging Center: A shared facility for state-of-the-art microscopy at UD”, NIH Academy, Delaware Biotechnology Institute

2019 “Stromule-guided chloroplast movement”, Chloroplast Biotechnology Gordon Research Conference, Ventura California

2019 “Core Facility Resources”, Junior Investigators Network, University of Delaware

2019 “Bio-Imaging Center: Past, Present, and Future”, Molecular Probes Imaging Workshop, Delaware Biotechnology Institute

2018 “Stromule-directed chloroplast movement during plant immunity: does the tail wag the dog?”, University of Pennsylvania

2017 “Shedding light on the role of chloroplast dynamics during plant innate immunity”, University of Delaware

2016 “Chloroplast stromules: the formation and functioning during plant innate immunity”, Donald Danforth Center, St. Louis

2016 “Chloroplast stromules: the formation and functioning during plant innate immunity”, The 17th Annual Plant Biology Mini-Symposium, University of Maryland.

2016 “The Bio-Imaging Center at the Delaware Biotechnology Institute: a core facility for electron, light and atomic force microscopy”, OSCAR Center, Delaware State University

2015 “Correlative Microscopy: Biological Applications and Approaches”, Carl Zeiss, NY

2014 “Nobel Prize in Chemistry Eric Betzig, Stefan W. Hell & William E. Moerner” Nobel Prize Symposium, University of Delaware

2013 “Revealing new insights into biological questions with super resolution microscopy”, Three site tour across Canada, McGill University, Sherbrooke University, and Hotel Dieu Research Center Laval University

2013 Panel Member: Regional Core Instrumentation Centers: Leveraging Northeast IDeA-funded Resources, Northeastern Regional Information Center, University of Delaware

2012 “Characterization of chloroplast dynamics during programmed cell death and plant innate immunity”, Department of Plant Biology, University of California, Davis

2012 Correlative microscopy: correlating back scattered TEM-like SEM images and super resolution microscopy, Appalachian Regional Microscopy Society, University of Tennessee

2011 “Advances in microscopy techniques to study plant-microbe interactions” Invited talk for the Rhizosphere Science Workshop, University of Delaware

*Keynote*

2016Keynote speaker: “Microscopy: playing at the intersection of art and science”, Art in Science, Interdisciplinary Science and Engineering Laboratory, University of Delaware

*Panel*

2019 Panel member: “Research Resources”, College of Health Sciences Research Day, University of Delaware

2015 Panel member: “Shared Resource Sections of COBRE, INBRE, and SIG Grants: What reviewers are looking for”, Northeastern Regional Information Center, Bar Harbor, Maine

2014 Panel Chair: “Managing a Successful Core: Developing business models that best fit your research environment and how to set goals for sustainability”, National IDeA Symposium of Biomedical Research, Washington DC

*Seminar series*

2019 “The DBI Bio-Imaging Center: A shared facility for state-of-the-art microscopy at UD”, Chemistry Biology Interface Seminar Series, University of Delaware

2016 “Chloroplast stromules: the formation and functioning during plant innate immunity”, Department of Plant and Soil Sciences, University of Delaware

2015 “The DBI Bio-Imaging Center: A highly accessible resource for advanced microscopy techniques at UD”, Animal and Food Sciences, University of Delaware

2011 “Chloroplastic stromules function during programmed cell death and innate immunity”, Department of Biological Sciences, University of Delaware

2009 “Emerging perspectives on the role of chloroplasts during a plant innate immune response”, Department of Plant and Soil Sciences, University of Delaware

2008 “Discovery of multi-chaperone complexes required for plant innate immunity”, Department of Molecular, Cellular, and Developmental Biology, Yale University

2007 “Shotgun proteomics without a sequenced genome: TRAQing proteins during an N-mediated defense response to TMV” Botany Seminar, Department of Molecular, Cellular, and Developmental Biology, Yale University

**TEACHING EXPERIENCE**

*Active*

2012-present **Instructor** for Confocal Microscopy I (BISC850), UD

2009-present **Trainer** of undergraduates, graduate students and post-doctoral researchers to conduct confocal microscopy, multiphoton microscopy, super-resolution microscopy, laser capture microdissection, conventional light microscopy, cryo-scanning electron microscopy and sample preparation, UD

*Completed*

2013 **Guest lecturer** for Experimental Methods in Mol and Cell Biology, UPenn

2011 **Guest lecturer** for Botany (PLSC101), UD

2010-2011 **Guest lecturer** for Confocal Microscopy I (BISC850), UD

2010 **Guest lecturer** for Paradigms in Cell Signaling (PLSC667), UD

2008 **Teaching Fellow:** Experimental Strategies in Cellular Biology, Yale

2007 **Teaching Fellow**: Nucleic Acid Lab, Yale

2006 **Teaching Fellow**: Biotechnology, Yale

2004 **Teaching Fellow:** Concepts and Logic: Genetic Analysis, Yale

2003  **Teaching Fellow:** Concepts and Logic: Genetic Analysis, Yale

**MENTORING**

*Current postdocs, students and research scientists*

2019-present **Richard West**, **Associate Scientist I,** Bio-Imaging Center, CBBI

2019-present **Deji Adekanye**, graduate student, **MS**, Department of Biological Sciences

2018-present **Kody Seward**, graduate student, **MS**, Department of Biological Sciences

2018-present **Sylvain Le Marchand**, **Associate Scientist I**, Bio-Imaging Center, DBI

2016-present **Tim Chaya**, **Limited term researcher,** Department of Plant and Soil Sciences

2015-present **Alex Nedo**, graduate student, **PhD**, Department of Biological Sciences

2013-present **Kun Huang**, **Research Scientist III**, Department of Plant and Soil Sciences

2012-present **Jean Ross**, **Research Scientist II**, Bio-Imaging Center, DBI

2012-present **Chandran Sabanayagam**, **Associate Scientist I**, Bio-Imaging Center, DBI

2012-present **Shannon Modla,** **Research Scientist III,** Bio-Imaging Center, DBI

2012-present **Deborah Powell,** **Research Scientist III**, Bio-Imaging Center, DBI

*Former postdocs, students, and research scientists*

2019 **Matt Rigor, INBRE Summer Scholar**, Department of Biomedical Engineering

2016-2019 **Tim Chaya**, **MS**, Plant and Soil Sciences, Limited term researcher

2018 **Tianna Cooks, INBRE Summer Scholar,** Delaware State University

2015-2017 **Ali Alqarni,** **MS**, PhD student at King Faisal University

2011-2017 **Michael Moore, MS**, Core Facility Manager at DSU Imaging Facility

2015-2017 **Andrew Moore**, **MS**, Research Associate at Prelude Therapeutics, Inc

2015-2017 **Solomon Lynch**, **PhD**, Obtaining teaching certificate

2013-201 **Katharine Minker**, **MS,** Lecturer at Community College of Philadelphia

2011-2015 **Dr.** **Amutha Kumar,** **Postdoc**, Scientist at NY Department of Health

2012-2013 **Dr.** **Meredith Bierzycki**, **Postdoc**, Previously Lecturer at UD

2010-2012 **Kyle Hoban,** **Undergrad**., Graduate Student at John Hopkins

2012 **Dr. Carissa Young**, **Postdoc**, Translational Lead|CMC Modeling at Takeda

2011 **Summer Thompson**, **Undergrad**. Associate Scientist III at BioReliance

2010 **Jen Colby, Undergrad**. Research Associate at QPS, LLC

*Current Graduate Thesis Committee Served*

2019-present **Christine Rourke, PhD**, Department of Biological Sciences

2019-present **Hannah Streett, PhD,** Department of Chemical and Biomolecule Engineering

2018-present **Nina Sampilo, PhD,** Department of Plant and Soil Sciences

2018-present **Sara Blizard, MS,** Department of Plant and Soil Sciences

2018-present **Xiaolu Xu, PhD,** Department of Biological Sciences

2017-present **Rebecca Noll, PhD**, Department of Biological Sciences

2016-present **Barbara Romero, PhD**, Department of Biological Sciences

2016-present **Salma Al Saai, PhD**, Department of Biological Sciences

2016-present **Jessica Cooper, PhD**, Department of Plant and Soil Sciences

2016-present **Omar Banda, PhD,** Department of Material Sciences and Engineering

*Previous Graduate Thesis Committee Served (Past 5 years)*

2017-2019 **Cara Giordana, MS**, Department of Biological Sciences

2016-2019 **Colleen Pike, PhD**, Department of Biological Sciences

2017-2019 **Nick Johnson,MS,** Department of Plant and Soil Sciences

2017-2018 **Taozhu Yan, PhD**, Department of Plant and Soil Sciences

2017-2018**Aditi Makhija, MS,** Department of Biological Sciences

2011-2018 **Cherish Warner, PhD**, Department of Plant and Soil Sciences

2016-2017 **Rosaria Formisano, PhD**, Delaware State University

2016-2017 **Fawziya Barnawi, MS**, Department of Biological Sciences

2013-2017 **Chin-Chen Kou, PhD**, Department of Material Sciences and Engineering

2016-2017 **Xu Wang, PhD,** Department of Plant and Soil Sciences

2014-2016 **Aparna Swarup, MS**, Department of Biological Sciences

2014-2016 **Kelly Fisher, MS**, Department of Biological Sciences

2012-2014 **Weir Cui, PhD,** Department of Plant and Soil Sciences

2012-2014 **Liangqi Ouyang, PhD**, Department of Material Sciences and Engineering

2012-2014 **Shaily Patel**, **Undergraduate**, Department of Biological Sciences

**PROFESSIONAL AFFILIATIONS**

2019-present **Member** of the American Society of Cell Biology

2009-present **Member** of the Microscopy Society of America

2009-present **Member** of the American Society of Plant Biology

2006-present **Member** of the New York Academy of Sciences

**PROFESSIONAL SERVICES**

2008-present **Journal reviewer** for Molecular Plant-Microbe Interactions, Plant Cell, J of Visual Exp, Plant Cell, Planta, Science, FEBS Letters, PLoS One

2018 **Grant Panel:** NIH, S10 Special Emphasis Panel on Shared Instrumentation, Alternate Chair

2015 **Grant Panel:** DOE, Office of Biological & Environmental Research (BER), Pilot Lab Projects

2015 **Grant Panel:** NIH, S10 Special Emphasis Panel on Shared Instrumentation

**UNIVERSITY SERVICES**

*Active*

2019-present **Member** of the Plant and Soil Sciences Graduate Admissions Committee

2013-present **Member** of the University Research Council

2013-present **Host** of the Molecular Probes Workshop on advances in light microscopy

2009-present **Tour guide** for the Bio-Imaging Center for students (K-12, undergraduate & graduate), teachers, visiting faculty, and politicians.

2018 **Grant Panel:** College of Agriculture and Natural Resources Seed Grant, UD

*Completed*

2017-2018 **Member** of Research Information Management scoping committee at UD

2014-2015 **Member** of Strategic Planning Initiative, Models for the New American Research University, Infrastructure sub group

2012 **Member** of the Core Facilities Task Force at UD

2011 **Host** for Bio-Imaging Center event for the Delaware Life Science Professionals

2010 **Host**, Microscopy module for the First Year Student experience

2010 **Host**, Microscopy module for the ISEQ Teacher’s Workshop, University of Delaware

2004-2006 **Coordinator** of Research in Progress Seminars, Department of Molecular, Cellular, and Developmental Biology, Yale University

**REFERENCES**

Dr. SP Dinesh-Kumar Relationship: PhD Mentor, Collaborator
University of California, Davis Position: Professor and Interim Chair

Section of Plant Biology & Genome Center Phone: 530-752-2205

LSA1009, One Shields Avenue Email: spdineshkumar@ucdavis.edu
Davis, CA 95616

Dr. Janine Sherrier Relationship: Collaborator
University of Georgia Position: Department Head

Department of Crop and Soil Sciences Phone: 706-542-0900

3111 Miller Plant Sci, 120 Carlton St. Email: djsherrier@uga.edu

Athens, GA 30602

Dr. Blake Meyers Relationship: Collaborator

Donald Danforth Plant Science Center Position: Professor

975 N. Warson Rd. Phone: 302-299-2503

St. Louis, MO 63132 Email: BMeyers@danforthcenter.org