

# Markita del Carpio Landry

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## RESEARCH SUMMARY

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My research group merges the fields of single-molecule biophysics, colloid/interface science, and nanotechnology to develop probes for imaging neuromodulation in the brain, to study lipid nanoparticle-based nucleic acid delivery, and for the delivery of genetic material to plants. My lab's research has been highlighted in [NPR](#), [Popular Mechanics](#), [The San Francisco Chronicle](#), [TEDx](#), and [C&E news](#). Short research talks (in both English and Spanish) [available on my lab website](#).

## POSITIONS AND AFFILIATIONS

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- **University of California, Berkeley**, Berkeley, CA  
Associate Professor, Chemical and Biomolecular Engineering, 07/2022 – present  
Associate Professor, Department of Neuroscience, 07/2024 – present  
Associate Professor, Department of Molecular and Cellular Biology, 08/2025 – present  
Assistant Professor, Chemical and Biomolecular Engineering, 07/2016 – 07/2022
- **Lawrence Berkeley National Laboratory**, Berkeley, CA  
Faculty Scientist, Molecular Biophysics and Integrated Bioimaging, 01/2017 - present
- **Chan-Zuckerberg Biohub**, San Francisco, CA  
Investigator, 02/2017 - present
- **Co-Founder, Biophilia Genetics**  
CSO, 06/2023 – present
- **Consultant for and/or advisory board member of**  
Terramera, 2018 – present  
Biotelliga, 2025 – present  
Threeum, 2025 – present  
Burroughs Wellcome Fund, 2023 – present  
Syngenta, 2023 – 2024

## EDUCATION

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- **Massachusetts Institute of Technology**, Cambridge, MA  
NSF Post-doctoral Research Fellow, Chemical Engineering, 2013 – 2016  
Postdoctoral Advisor: Michael S. Strano
- **University of Illinois at Urbana-Champaign**, Champaign, IL  
**Ph.D.** Chemical Physics, 2012  
Advisor: Yann R. Chemla  
Thesis Title: *Single-molecule methods for an improved understanding of biophysical interactions: From fundamental biology to applied nanotechnology*  
**Certificate** in Business Administration, 2009
- **University of North Carolina at Chapel Hill**, Chapel Hill, NC  
**B.S.** Chemistry, Biochemistry Track, 2006  
**B.A.** Physics, 2006

## HONORS AND AWARDS

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2026	Fullbright Fellow – ( <a href="#">About</a> )
2026	Alexander von Humboldt Foundation Bessel Award ( <a href="#">About</a> )
2026	Harvard Radcliffe Fellowship ( <a href="#">About</a> )
2025	Guggenheim Fellow ( <a href="#">About</a> )
2025	MIT Charles L. Cooney Endowed Lecture ( <a href="#">About</a> )
2025	Caltech Robert W. Vaughan Endowed Lecture ( <a href="#">About</a> )
2025	Member, National Academies of Science of Bolivia ( <a href="#">About</a> )
2024	Blavatnik National Laureate in Chemistry ( <a href="#">About</a> )
2024	Member, New York Academy of Sciences ( <a href="#">About</a> )

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2024	Notre Dame 2024 Thiele Award lecture ( <a href="#">About</a> )
2024	Heising-Simons Faculty Award ( <a href="#">About</a> )
2024	Society for Neuroscience (SfN) Presidential Lecture
2023	Schmidt Polymaths Award ( <a href="#">About</a> )
2023	Keck Foundation Award ( <a href="#">About</a> )
2023	The Purdue Duncan and Suzanne Mellichamp Award Lectureship ( <a href="#">About</a> )
2023	Bakar Prize ( <a href="#">About</a> )
2022	UNC Chapel Hill Distinguished Young Alumni Award ( <a href="#">About</a> )
2022	National Academies Science Diversity Leadership Award Honorable Mention ( <a href="#">About</a> )
2022	McKnight Scholar Award ( <a href="#">About</a> )
2022	Philomathia Prize ( <a href="#">About</a> )
2022	Vilcek Prize for Creative Promise in Biomedical Science ( <a href="#">About</a> )
2021	Chan-Zuckerberg Biohub Investigator ( <a href="#">About</a> )
2021	Dreyfus Foundation Teacher-Scholar Award ( <a href="#">About</a> )
2021	NSF CAREER Award ( <a href="#">About</a> )
2021	2021 Nature Research Awards for Inspiring Women in Science ( <a href="#">About</a> )
2021	NAS Standing Committee on Biotechnology Capabilities and National Security Needs
2021	University of Illinois at Urbana-Champaign Commencement Speaker
2020	Cell Press 100 Most Inspiring Hispanic/Latinx Scientists in America ( <a href="#">About</a> )
2020	SfN Janett Rosenberg Trubatch Career Development Award ( <a href="#">About</a> )
2020	University of Illinois Alumni Association Young Alumni Award ( <a href="#">About</a> )
2020	Frontiers of Imaging: CZI Deep Tissue Imaging Award ( <a href="#">About</a> )
2020	2020 Emerging Leader in Molecular Spectroscopy Award ( <a href="#">About</a> )
2020	ECS Nanocarbons Division Young Investigator Award ( <a href="#">About</a> )
2019	C&EN Talented 12 ( <a href="#">About</a> )
2019	Kavli Fellow, National Academies of Science ( <a href="#">About</a> )
2019	Bakar Fellow ( <a href="#">About</a> )
2019	Prytanean Faculty Award ( <a href="#">About</a> )
2018	Society of Hispanic Professional Engineers Young Investigator Award ( <a href="#">About</a> )
2018	HHMI Gilliam Fellow ( <a href="#">About</a> )
2018	DARPA Young Faculty Award ( <a href="#">About</a> )
2018	Sloan Foundation Fellow ( <a href="#">About</a> )
2017	Kavli Fellow, National Academies of Engineering ( <a href="#">About</a> )
2017	Innovative Genomics Institute Fellow ( <a href="#">About</a> )
2017	Foundation for Food and Agriculture Research (FFAR) New Innovator Award ( <a href="#">About</a> )
2017	Hellen Wills Neuroscience Institute – Radical Ideas Awardee ( <a href="#">About</a> )
2017	Stanley Fahn Junior Faculty Award ( <a href="#">About</a> )
2017	Beckman Foundation Young Investigator ( <a href="#">About</a> )
2017	Chan-Zuckerberg Biohub Investigator ( <a href="#">About</a> )
2016	Burroughs Wellcome Fund Career Award at the Scientific Interface ( <a href="#">About</a> )
2015	Brain and Behavior Foundation (NARSAD) Young Investigator Award ( <a href="#">About</a> )
2015	NIH Follow That Cell Challenge – Finalist ( <a href="#">About</a> )
2014	Burroughs Wellcome Fund PDEP ( <a href="#">About</a> )
2013	NSF Postdoctoral Research Fellowship
2009	NSF Graduate Research Fellowship
2011	Society of Hispanic Professional Engineers Fellowship
2008	TA of Excellence Award: Teaching Assistant rated as excellent by students

### LANGUAGES

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English	Native speaker, writer, reader
French	Native speaker, writer, reader
Spanish	Native speaker, writer, reader

### PUBLICATIONS

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‡corresponding author

1. Mun, J., Power, K.C., Beery, A.K., **Landry, M.P.**‡ Neurochemical imaging reveals changes in dopamine dynamics with photoperiod in a seasonally social vole species. *PNAS* (2026)

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- Voike, E., Arral, M., Squire, H.J., Lin, T., Coreas, R., Lui, A., Lavarone, A.T., Pinals, R.L.‡, Whitehead, K.A.‡, **Landry, M.P.‡** Protein corona formed on lipid nanoparticles compromises delivery efficiency of mRNA cargo. *Nature Communications* (2025)
- Nishitani, S., Ao, K., Jalil, A., Arias, T., Moudi, A., Chen, F., Biyani, A., Muppirala, P.N., **Landry, M.P.‡** Redox dye mediated fluorescence energy transfer of carbon nanotube based nanosensors. *PNAS* (2025)
- Black, A.B., Komatsu, N., Zhao, J., Raskey, S.R., Serrano, N.S., Sharma, S.R., Manoli, D.S., **Landry, M.P.‡**, Beery, A.K.‡ Oxytocin receptors mediate social selectivity in prairie vole peer relationships. *Current Biology* (2025)
  - Highlighted in [Popular Science](#)
  - Highlighted in [UC Berkeley News](#)
- Mun, J., Jackson, S., Prounis, G., Phumsatitpong, C., Motahari, N., Kriegsfeld, L., **Landry, M.P.**, Wilbrecht, L.‡ Absence of testes at puberty impacts functional development of nigrostriatal but not mesoaccumbal dopamine terminals in a wild-derived mouse. *eNeuro* (2025)
- Klinger, M.E., Miller, R., Wilbrecht, L., **Landry, M.P.‡** Optical fibers functionalized with single-walled carbon nanotubes for flexible fluorescent catecholamine detection. *Langmuir* (2025)
- Kou, E., Luo, Z., Ye, J., Xu, C., Lu, D., **Landry, M.P.**, Zhang, H., Zhang, H.‡ Sunlight-sensitive carbon dots for plant immunity priming and pathogen defense. *Plant Biotechnology Journal* (2025)
- Ashkarran, A.A., Gharibi, H., Sadeghi, S.A., Modaresi, S.M., Wang, Q., Lin, Lin, T., Yerima, G., Tamadon, A., Sayadi, M., Jafari, M., Lin, Z., Ritz, D., Kakhniashvili, D., Guha, A., Mofrad, M., R., Sun, L., **Landry, M.P.**, Saei, A.A., Mahmoudi, M.‡ Small molecule modulation of protein corona for deep plasma proteome profiling. *Nature Communications* (2024)
- Squire, H., Tomatz, S., Wang, J., Gonzalez-Grandio, E., **Landry, M.P.‡** Best practices and pitfalls in developing nanomaterial delivery tools for plants. *ACS Nano* (2024)
- Huzar, J., Coreas, R., **Landry, M.P.**, Tikhomirov, G.‡ AI-based Prediction of Protein Corona Composition on DNA Nanostructures. *ACS Nano* (2024)
- Mun, J., Navarro, N., Jeong, S., Ouassil, N., Leem, E., Beyene, A.G., **Landry, M.P.‡** Near Infrared Nanosensors Enable Optical Imaging of Oxytocin with Selectivity over Vasopressin in Acute Mouse Brain Slices. *PNAS* (2024)
- Safaei, M.M.\*, Nishitani, S.\*, McFarlane, I.R., Yang, S.J., Sun, E., Medina, S.M, **Landry, M.P.‡** Dual Infrared 2-Photon Microscopy Achieves Minimal Background Deep Tissue Imaging in Brain and Plant Tissues. *Advanced Functional Materials* (2024)
- Squire, H., Kim, M., Wong, C., Seng, A., Lee, A., Goh, N., Wang, J., **Landry, M.P.‡** Cellulose Nanocrystals Protect Plants from Pathogen Infection. *ACS Applied Nanomaterials* (2024)
- Kelich, P., Adams, J., Jeong, S., Navarro, N., **Landry, M.P.**, Vuković, L.‡ Predicting Serotonin Detection with DNA-Carbon Nanotube Sensors Across Multiple Spectral Wavelengths. *Journal of Chemical Information and Modeling* (2024)
- Ledesma, F., Nishitani, S., Cunningham, F.J., Hubbard, J.D., Yim, D., Lui, A., Chio, L., Murali, A., **Landry, M.P.‡** Covalent Attachment of Horseradish Peroxidase to Single-Walled Carbon Nanotubes for Hydrogen Peroxide Detection. *Advanced Functional Materials* (2024)
- Gharibi, H., Ashkarran, A., Jafari, M., Voike, E., **Landry, M.P.**, Saei, A., Mahmoudi, M.‡ A uniform data processing pipeline enables harmonized nanoparticle protein corona analysis across proteomics core facilities. *Nature Communications* (2024)
- Rosenberg, D. J., Cunningham, F. J., Hubbard, J., D., Goh, N. S., Wang, J. W., Nishitani, S., Hayman, E., Hura, G., L., **Landry, M.P.**, Pinals, R. L.‡ Mapping the morphology of DNA on carbon nanotube-based sensors in solution using X-ray scattering interferometry. *Journal of the American Chemical Society* 2023
- Nishitani, S., Tran, T., Yang, L., Landry, M.P. **Landry, M.P.‡** Engineered glucose oxidase-carbon nanotube conjugates for tissue-translatable glucose nanosensors. *Angewandte Chemie* (2023)
- Sorooshyari, S.K., Ouassil, N., Yang, S.J., **Landry, M.P.‡** Identifying Neural Signatures of Dopamine Signaling with Machine Learning. *ACS Chemical Neuroscience* (2023)
  - Selected for journal cover

20. Wang, J.W., Goh, N., Lien, E., Gonzalez Grandio, E., **Landry, M.P.**‡ Delivered complementation in planta (DCIP) enables measurement of peptide-mediated protein delivery efficiency in plants. *Nature Communications Biology* (2023)
21. Mahmoudi, M.‡, **Landry, M.P.**, Moore, A., Coreas, R.‡ The protein corona from nanomedicine to environmental science. *Nature Reviews Materials* (2023)
  - Selected for journal cover
22. Squire, H., Tomatz, S., Voke, E., **Landry, M.P.**‡ The emerging role of nanotechnology in plant genetic engineering. *Nature Reviews Bioengineering* (2023)
23. Sharifi, S., Reuel, N.F., Kallmyer, N.E., Sun, E., **Landry, M.P.**‡, Mahmoudi, M.‡ The issue of reliability and repeatability of analytical measurements in industrial and academic nanomedicine. *ACS Nano* (2022)
24. Ashkarran, A.A., Gharibi, H., Voke, E., **Landry, M.P.**, Saei, A.A.‡, Mahmoudi, M.‡ Measurements of heterogeneity in proteomics analysis of nanoparticle protein corona across core facilities. *Nature Communications* (2022)
25. Munos, A., Theusch, E., Kuang, Y.L., Nalula, G., Peaslee, C., Dorlhiac, G., **Landry, M.P.**, Streets, A., Krauss, R.M., Iribarren, C., Mattis, A.N., Medina, M.W.‡ Undifferentiated Induced Pluripotent Stem Cells as a Genetic Model for Nonalcoholic Fatty Liver Disease. *Cellular and Molecular Gastroenterology and Hepatology* (2022)
26. Zhang, H.\*, Goh, N.S.\*, Wang, J., Demirer, G.S., Butrus, S., Park, S-J, **Landry, M.P.**‡ Nanoparticle Cellular Internalization is Not Required for RNA Delivery to Mature Plant Leaves. *Nature Nanotechnology* (2022)
  - Highlighted in [Nature Materials \(2021\)](#), [C. Horejs](#)
27. Ouassil, N.\*, Pinals, R.L.\*, O'Donnell, J.T.D., Wang, J., **Landry, M.P.**‡ Supervised Learning Model to Predict Protein Adsorption to Nanoparticles. *Science Advances* (2022)
28. Zhang, X., Dorlhiac, G., **Landry, M.P.**, Streets, A.‡ Phototoxic effects of nonlinear optical microscopy on cell cycle, oxidative states, and gene expression. *Scientific Reports* (2022)
29. Zahir, A., Serag, M.F., Demirer, G.D., Torre, B., di Fabrizio, E., **Landry, M.P.**, Habuchi, S.‡, Mahfouz, M.‡ DNA-Carbon Nanotube Binding Mode Determines the Efficiency of Carbon Nanotube-Mediated DNA Delivery to Intact Plants. *ACS Applied Nano Materials* (2022)
30. Gonzalez-Grandio, E., Demirer, G.S., Jackson, C.T., Yang, D., **Landry, M.P.**‡ Carbon nanotube biocompatibility in plants is determined by their surface chemistry. *Journal of Nanobiotechnology* (2022)
31. Sharifi, S., Mahmoud, N., Voke, E., **Landry, M.P.**‡, Mahmoudi, M.‡ Importance of standardizing analytical characterization methodology for improved reliability of the nanomedicine literature. *Nano-Micro Letters* (2022)
32. Grandio-Gonzalez, E., Demirer, G.S., Ma, W., Brady, S.M., **Landry, M.P.**‡ A ratiometric dual color luciferase reporter for fast characterization of transcriptional regulatory elements. *ACS Synthetic Biology* (2021)
33. Kelich, P., Jeong, S., Navarro, N., Adams, J., Sun, X., Zhao, H., **Landry, M.P.**‡, Vukovic, L.‡ Machine learning enables discovery of DNA carbon nanotube sensors for serotonin. *ACS Nano* (2021)
34. Jackson, C.T., Wang, J.W., Gonzalez-Grandio, E., Goh, N., Mun, J., Krishnan, S., **Landry, M.P.**‡ Polymer-Conjugated Carbon Nanotubes for Biomolecule Loading. *ACS Nano* (2021)
35. O'Donnell, J.T., Mun, J., Delevich, K.‡, **Landry, M.P.**‡ Synthetic nanosensors for imaging neuromodulators. *Journal of Neuroscience Methods* (2021)
36. Jeong, S., Grandio, E.G., Navarro, N., Pinals, R., Ledesma, F., Yang, D., **Landry, M.P.**‡ Extraction of Viral Nucleic Acids with Carbon Nanotubes Increases SARS-CoV-2 RT-qPCR Detection Sensitivity. *ACS Nano* (2021)
37. Zhang, H., Cao, Y., Xu, D., Goh, N.S., Demirer, G.S., Chen, Y., **Landry, M.P.**‡, Yang, P.‡ Gold nanocluster mediated delivery of siRNA to intact plant cells for efficient gene knockdown. *Nano Letters* (2021)
38. Wang, J.W., Cunningham, F.J., Goh, N., Boozarpour, N.N., Pham, M., **Landry, M.P.**‡ Nanoparticles for protein delivery in planta. *Current Opinion in Plant Biology* (2021). 60 (102052).
39. Pinals, R., Ledesma, F., Yang, D., Jeong, S., Navarro, N., Pak, J.E., **Landry, M.P.**‡ Rapid SARS-CoV-2 Detection by Carbon Nanotube-Based Near-Infrared Nanosensors. *Nano Letters* (2021) 21(5), 2272–2280
40. Voke, E., Pinals, R.L., Goh, N., **Landry, M.P.**‡ In Planta Nanosensors: Understanding Bio-corona Formation for Functional Design. *ACS Sensors* (2021)

41. Yang, S., Del Bonis-O'Donnell, **Landry, M.P.†** Near-infrared catecholamine nanosensors for high spatiotemporal dopamine imaging. *Nature Protocols* (2021). 16, 3026–3048
42. Demirer, G.S.†, Silva, T.N., Jackson, C.T., Thomas, J.B., Ehrhardt, D., Rhee, S.Y.†, Mortimer, J.C.†, **Landry, M.P.†** Nanotechnology to advance CRISPR/Cas genetic engineering of plants. *Nature Nanotechnology* (2021). 16, 243–250
43. Demirer, G.S.†, **Landry, M.P.†** Efficient Transient Gene Knock-down in Tobacco Plants Using Carbon Nanocarriers. *Bio-protocol* (2021). 11(1)
44. Pinals, R.L., Yang, D., Rosenberg, D.J., Chaudhary, T., Crothers, A.R., Iavarone, A.T., Hammel, M., **Landry, M.P.†** Quantitative Protein Corona Composition and Dynamics on Carbon Nanotubes in Biological Environments. *Angewandte Chemie* (2020). 59 (52), 23668-23677
45. Yang, D., Yang, S., Del Bonis-O'Donnell, J. T., Pinals, R., **Landry, M.P.†** Transcriptomic and morphological response of SIM-A9 mouse microglia to carbon nanotube neuro-sensors. *ACS Nano* (2020). 14 (10), 13794–13805
46. Hofmann, T., Lowry†, G.V.†, Ghoshal, S., Tufenkji, N., Brambilla, D., Dutcher, J.R., Gilbertson, L.M., Giraldo, J. P., Kinsella, J. M., **Landry, M.P.**, Lovell, W., Naccache, R., Paret, M., Pedersen, J. A., Unrine, J., M., White, J.C., Wilkinson, K.J. Technology readiness and overcoming barriers to sustainably implement nanotechnology-enabled plant agriculture. *Nature Food* (2020). 1, 416–425
47. Zhang, H., Liu, X., Zhang, C., Su, J., Lu, X., Shi, J., Wang, L., **Landry, M.P.**, Zhu, Y., Lv, M., Mi, X† Ultrasensitive Fluorescent Microarray Platform for Nucleic Acid Test. *Sensors and Actuators B* (2020). 321, 128538
48. Pinals, R.L., Chio, L., Ledesma, F., **Landry, M.P.†** Engineering at the nano-bio interface: harnessing the protein corona towards nanoparticle design and function. *Analyst* (2020). 145, 5090 - 5112
49. Alizadehmojarad, A.A., Zhou, X., Beyene, A.G., Chacon, K., Sung, Y., **Landry, M.P.†**, Vuković, L.† Binding affinity and conformational preferences influence kinetic stability of short oligonucleotides on carbon nanotubes. *Advanced Materials Interfaces* (2020). 7 (15), 2000353
50. Zhang, H., Zhang, H., Demirer, G.S., Gonzales-Grandio, E., Fan, C., **Landry, M.P.†** Engineering DNA nanostructures for siRNA delivery in plants. *Nature Protocols* (2020). 15, 3064–3087
51. Jeong, S. Pinals, R.L., Sharmadhikari, B., Song, H., Kalluri, A., Debnath, D., Wu, Q., Ham, M.H., Patra, P.†, **Landry, M.P.†** Graphene Quantum Dot Oxidation Governs Noncovalent Biopolymer Adsorption. *Scientific Reports* (2020). 10, 7074
52. Demirer, G.S., Zhang, H., Goh, N.S., Chang, R., **Landry, M.P.†** Carbon nanocarriers deliver siRNA to intact plant cells for efficient gene knockdown. *Science Advances* (2020). 6 (26).
53. Heller, D.†, Jena, P., Pasquali, M. Kostarelos, K.,... **Landry, M.P.**, Wenseleers, W., Yudaska, M. Banning carbon nanotubes would be scientifically unjustified and damaging to innovation. *Nature Nanotechnology* (2020). 15, 164–166
54. Chio, L., Pinals, R., Murali, A., Goh, N.S., **Landry, M.P.†** Surface Modification Effects on Single-Walled Carbon Nanotubes for Multimodal Optical Applications. *Advanced Functional Materials* (2020). 30 (17), 1910556
55. Cunningham, F.J., Demirer, G.S., Goh, N.S., Zhang, H., Landry, M.P.†. Nanobiologics: An Emerging Genetic Transformation Approach. *Biolytic DNA Delivery in Plants* (2020). pp 141-159
56. Pinals, R.L.\*, Yang, D.\*, Lui, A., Cao, W., **Landry, M.P.†** Corona exchange dynamics on carbon nanotubes by multiplexed fluorescence monitoring. *JACS* (2019). 142 (3), 1254–1264
57. Jeong, S., Yang, D., Beyene, A.G., O'Donnell, J.T.D., Gest, A. M., Navarro, N., Sun, X., **Landry, M.P.†** High Throughput Evolution of Near Infrared Serotonin Nanosensors. *Science Advances* (2019). 5 (12), 1-12
58. Lui, A., Wang, J., Chio, L., **Landry, M.P.†** Synthetic probe development for measuring single or few-cell activity. (2019). *Methods in Enzymology*
59. **Landry, M.P.†**, Mitter, N.† How nanocarriers delivering cargoes in plants can change the GMO landscape. *Nature Nanotechnology* (2019). 14, 512–514
60. Demirer, G.S., Zhang, H., Goh, N.S., Grandio, E.G., **Landry, M.P.†** Carbon nanotube-mediated DNA delivery without transgene integration in intact plants. *Nature Protocols*, (2019). 14, 2954–2971

61. Beyene, A. G., Delevich, K., O'Donnell, J.T.D., Piekarski, D.J., Lin, W.C., Thomas, A.W., Yang, S.J., Kosillo, P., Yang, D., Wilbrecht, L., **Landry, M.P.**† Imaging Striatal Dopamine Release Using a Non-Genetically Encoded Near-Infrared Fluorescent Catecholamine Nanosensor. *Science Advances* (2019). 5 (7), 1-11
  - Highlighted in [Nature \(2019\)](#), [J. Lambert](#)
  - Highlighted in [C&E News](#)
  - Highlighted in [the San Francisco Chronicle](#)
62. Chio, L., O'Donnell, J.T., Kline, M., Kim, J.H., McFarlane, I.R., Zuckermann, R.N., **Landry, M.P.**† Electrostatic-assemblies of single-walled carbon nanotubes and sequence-tunable peptoid polymers detect a lectin protein and its target sugars. *Nano Letters* (2019). 19 (11), 7563–7572
  - Selected for journal cover
63. Demirer, G.S., Zhang, H., Matos, J., Goh, N., Cunningham, F.J., Sung, Y., Chang, R., Aditham, A.J., Chio, L., Cho, M.J., Staskawicz, B., **Landry, M.P.**† High Aspect Ratio Nanomaterials Enable Delivery of Functional Genetic Material Without DNA Integration in Mature Plants. *Nature Nanotechnology* (2019). 14, 456-464
  - Interview and Highlighted on [NPR](#), [popular mechanics](#), and [C&E news](#)
  - Selected for NPR's [Changing the World One Invention at a Time](#) series
64. Zhang, H.\* , Demirer, G.S.\* , Zhang, H., Ye, T., Goh, N.S., Aditham, A.J., Cunningham, F.J., Fan, C., **Landry, M.P.**† Low-dimensional DNA Nanostructures Coordinate Gene Silencing in Mature Plants. *PNAS* (2019). 116 (15), 7543-7548
65. Wang, J.W, Grandio, E.G., Newkirk, G.M., Demirer, G.S., Butrus, S., Giraldo, J.P.†, **Landry, M.P.**† Nanoparticle-mediated genetic engineering of plants. *Molecular Plant* (2019). 12 (8), 1037-1040
66. Beyene, A.G., Delevich, K., Yang, S.J., **Landry, M.P.**† New Optical Probes Bring Dopamine to Light. *ACS Biochemistry* (2018). 57 (45), 6379-6381
67. Del Bonis-O'Donnell, J.T., Del Bonis-O'Donnell, J.T., Pinals, R., Jeong, S., Thakrar, A., Wolfringer, R., **Landry, M.P.**† Chemometric Approaches for Developing Infrared Nanosensors to Image Anthracyclines. *ACS Biochemistry* (2018). 58 (1), 54–64
68. Beyene, A. G., Alizadehmojarad, A.A., Dorlhiac, G., Streets, A.M., Kral, P., Vukovic, L.†, **Landry, M.P.**† Ultralarge Modulation of Fluorescence by Neuromodulators in Carbon Nanotubes with Self-Assembled Oligonucleotide Rings. *Nano Letters* (2018). 18 (11), 6995-7003
69. Del Bonis-O'Donnell, J.T., Chio, L., Dorlhiac, G.F., McFarlane, I.R., **Landry, M.P.**† Advances in Nanomaterials for Brain Microscopy. *NanoResearch* (2018). 11, 5144–5172
70. Zou, R., Zhu, X., Tu, Y.†, Wu, J.†, **Landry, M.P.**† Activity of Antimicrobial Peptides Decreases with Increased Cell Membrane Crossing Free Energy Cost. *ACS Biochemistry* (2018). 57 (18), 2606-2610
71. Cunningham, F.J., Goh, N., Demirer, G., Matos, J.L, **Landry, M.P.**† Nanoparticle-Mediated Delivery in Plants for Transgene-Free Genetic Engineering. *Cell Press Trends in Biotechnology* (2018). 36 (9), p. 882-897.
72. Kwak, S.Y., Giraldo, J.P., Wong, M.H., Koman, V., Lew, T., Ell, J., Weidman, M., Sinclair, R., **Landry, M.P.**, Tisdale, W.A., Strano, M.S.† A Nanobionic Light Emitting Plant. *Nano Letters* (2017). 8, 7552 – 7559
73. Li, S., Zou, R., Wu, J. †, **Landry, M.P.**† Cholesterol-Directed Nanoparticle Assemblies Based on Single Amino Acid Peptide Mutations Activate Cellular Uptake and Decrease Tumor Volume. *RSC Chemical Science* (2017). 8, 7552 – 7559
74. Luo, Z., Zou, R., Wu, J. †, **Landry, M.P.**† A Probe for the Detection of Hypoxic Cancer Cells. *ACS Sensors* (2017). (8), 1139-1145
75. Beyene, A.B., McFarlane, I.R., Pinals, R.L, **Landry, M.P.**† Stochastic Simulation of Dopamine Neuromodulation for Implementation of Fluorescent Neurochemical Probes in the Striatal Extracellular Space. *ACS Chemical Neuroscience* 8 (10), 2275-2289 (2017). 8 (10), 2275–2289
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### MANUSCRIPTS UNDER REVIEW OR REVISION AND ON BIORXIV

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99. Squire, H., Wang, J., **Landry, M.P.**‡ The third alpha helix of plant homeoproteins are generally cell-penetrating to plant cells. *bioRxiv* (2025) – under revision at *Nature Biotechnology*
100. Lin, Teng-Jui, Hillman, K., Kim, L., Garg, M., Duong, M., **Landry, M.P.**‡ Quantifying Misuse of Color in Biological Research. *bioRxiv* (2025)
101. Hubbard, H.J., Tomatz, S., Carll, N., Matos, J., Hassan, D., Ly, T., **Landry, M.P.**‡ Anionic polymers stabilize Cas9 ribonucleoprotein nanoparticles to improve direct protein delivery and genome editing efficiencies in plant protoplasts. *bioRxiv* (2025)
102. Coreas, R., Sridhar, N., Lin, T., Squire, H.J., Voke, E., **Landry, M.P.**‡ Deep profiling of plant stress biomarkers following bacterial pathogen infection with the nano protein corona. *bioRxiv* (2025)
103. Lin, T., **Landry, M.P.**‡ Quantifying Data Distortion in Bar Graphs in Biological Research. *bioRxiv* (2024)
  - Highlighted in [Nature](#)
  - Highlighted in [Science](#)
104. Nishitani, S., Ao, K., Jalil, A., Arias, T., Moudi, A., Chen, F., Biyani, A., Muppirala, P.N., **Landry, M.P.**‡ Redox dye mediated fluorescence energy transfer of SWCNT based nanosensors. *bioRxiv* (2024)
105. Dorlhiac, G., Streets, A.‡, **Landry, M.P.**‡ Isotopologues as a general strategy to image neurotransmitters with vibrational microscopy. *arXiv* (2022)
106. Yang, S.J., O'Donnell J.T., Giordani, F., Beyene, A., Piekarski, D., Schaffer, D.‡, **Landry, M.P.**‡ Synaptic scale dopamine disruption in Huntington's Disease model mice imaged with near infrared catecholamine nanosensors. *bioRxiv* (2022)

### PATENTS & INVENTION DISCLOSURES

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‡ Denotes lead inventor

1. **Landry, M.P.**‡, Tomatz, S., Schenstniy, K. Simultaneous high-efficiency editing of multiple alleles in plant cells. PCT Patent U Cal No. BK-2026-088-1 to be submitted March 2026
2. **Landry, M.P.**‡, Squire, H., Wang, J. Cell-penetrating peptides for nucleic acid and protein delivery in plants. PCT Patent Application No. PCT/US24/37862 filed November 14 2025
3. **Landry, M.P.**‡, Wilbrecht, L., Beyene, A. B., O'Donnell J.T.D. Near-Infrared probes for modulatory neurotransmitter imaging in brain tissue. US Patent US11,357,872 issued on Jun 14, 2022.
4. **Landry, M.P.**‡, Demirer, G.S. Mature plant transfection using carbon nanotubes. US Pat. No.11,661,606 issued on May 30 2023.
5. Kausch, A.P., **Landry, M.P.** ‡, Methods and Compositions for In Vivo Direct Genome Editing in Plants. UC Berkeley and University of Rhode Island Provisional Patent 18/495,731 filed October 26<sup>th</sup>, 2023.
6. **Landry, M.P.** ‡ Lui, A., High throughput method to validate lipid nanoparticle efficacy and cytotoxicity. UC Berkeley Invention disclosure filed May 2023.
7. **Landry, M.P.** ‡ Wang, J., Squire, H., Cell penetrating peptides for nucleic acid and protein delivery in plants. UC Berkeley Provisional Patent 63/513,497 filed July 13th 2023.

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8. **Landry, M.P.** ‡ Matos, J., Cunningham, F., Genome editing in plants with carbon nanotubes. UC Berkeley Invention disclosure filed April 2023.
9. **Landry, M.P.** ‡ Lui, A. A high-throughput *in vitro* method to determine the cytotoxicity and efficacy profiles of lipid-nanoparticle based therapeutics such as mRNA vaccines. Invention disclosure filed April 2023.
10. **Landry, M.P.** ‡ Grandio, E., Jeong, S. High-Yielding Extraction of Single-Stranded Nucleic Acids with Solid Substrates. Invention disclosure BK-2021-079 filed December 2021.
11. **Landry, M.P.** ‡ Zhang, H., Demirer, G.S. Gene Silencing in Plants with DNA Origami Nanostructures. Invention disclosure BK-2019-044 filed September 2018.
12. Strano, M.S. ‡, Giraldo, J.P., **Landry, M.P.** Ratiometric sensors from single chirality carbon nanotubes. US Patent US11002741B2 issued on May 5, 2021.
13. Strano, M.S. ‡, Giraldo, J.P., **Landry, M.P.**, Faltermeier, S. Nanobionic engineering of organelles and photosynthetic organisms. US Patent US11208628B2 issued on December 28, 2021.

### INVITED PRESENTATIONS

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#### (1) PRESENTATIONS GIVEN IN FRENCH

- **Speaker at Laval University.** *Courir Sans Gaz: Comment Fonctionnent les Protéines qui sont Indépendantes de Sources d'Énergie Externes? Une Étude à l'Échelle de la Molécule Unique.* (Translation: *Running without Gas: How do proteins independent from external energy sources function?*). Laval, Québec, Canada. (February 2011)

#### (2) PRESENTATIONS GIVEN IN SPANISH

- **Seminario a la Universidad Mayor de San Andres:** Estableciendo la plantas medicinales Bolivianas para el tratamiento de malestares psiquiatros (*Translation: Establishing Bolivian medicinal plants for treatment of psychiatric disorders*). La Paz, Bolivia (January 2025)
- **Seminario MADIMED, Universidad de La Habana:** Detección de lo Invisible: *El poder de la Luz Infrarroja Cercana Para Aplicaciones Biológicas.* (Translation: *The Power of Infrared Light in Bioengineering*) Habana, Cuba. (June 2016)
- **Conferencias Fisicas: Speaker at Universidad Mayor San Andrés:** *Observación de las Interacciones Proteínas y ADN con Pinzas Ópticas.* (Translation: *Observation of protein-DNA interactions with optical traps*). La Paz, Bolivia. (December 2008)

#### (3) PRESENTATIONS GIVEN IN ENGLISH

1. **21st European Molecular Imaging Meeting (Invited Plenary – Trailblazer Award Lecture):** *Near infrared molecular imaging of brain chemistry.* Ljubljana, Slovenia (March 2026)
2. **Hope College James and Jeanette Neckers Lecture (Invited Named Lecture):** *Near infrared molecular imaging of brain chemistry.* Holland, MI (February 2026)
3. **University of British Columbia Department of Chemical Engineering (Lecture):** *Neurochemical imaging reveals changes in social dynamics.* Vancouver, BC (February 2026)
4. **Pacificchem international conference (Invited):** *Dopamine nanosensors based on single-walled carbon nanotubes to understand brain development and disease.* Honolulu, HI (December 2025)
5. **Pacificchem international conference (Invited):** *Illuminating brain neurochemistry with nanoscale near-infrared probes.* Honolulu, HI (December 2025)
6. **University of Pennsylvania Department of Chemical and Biomolecular Engineering Seminar (Invited):** *Nanotechnologies for nucleic acid and protein delivery to plants.* Philadelphia, PA (December 2025)
7. **Shanghai Jiao Tong University Seminar (Invited):** *New nanotechnologies for plant bioengineering.* Shanghai, China (November 2025)
8. **Huazhong Agricultural University (Invited):** *New nanotechnologies for plant bioengineering.* Wuhan, China (October 2025)

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9. **Caltech Robert W. Vaughan Endowed Lecture (Invited Award Lecture):** *Neurochemical imaging to understand brain health and disease.* Pasadena, CA (October 2025)
10. **Cell Symposia: Towards sustainable agriculture: Genomics, bioengineering, and smart technologies (Invited):** *New nanotechnologies for plant bioengineering.* Sanya, China (October 2025)
11. **MIT Charles L. Cooney Endowed Lecture (Invited Award Lecture):** *Neurochemical imaging to understand brain health and disease.* Cambridge, MA (September 2025)
12. **Harvard Medical School Department of Neurobiology (Invited):** *Neurochemical imaging to understand brain health and disease.* Boston, MA (September 2025)
13. **BRAIN Foundation Synchrony (Invited):** *Neurochemical imaging to understand the basis of friendships.* Asilomar, CA (August 2025)
14. **American Society of Plant Biologists (ASPB) (Invited Panelist)** *Seed to Tree: How Policy Can Help Plant Science Discoveries Grow into Companies in the Emerging Bioeconomy.* Milwaukee, WI (July 2025)
15. **UC Berkeley in Martha's Vineyard (Invited):** *Neurochemical imaging to understand brain health and disease.* Edgartown, MA (July 2025)
16. **Blavatnik Science Symposium (Invited):** *Neurochemical imaging to understand the basis of friendships.* New York, NY (July 2025)
17. **International Conference on Plant Nanotechnology 2025 (Invited Plenary):** *Plant homeoproteins as a source of newly-discovered plant cell penetrating peptides.* Poznan, Poland (July 2025)
18. **Max Planck Institute for Dynamics and Self-Organization – MPI-DS Colloquium (Invited):** *Near-infrared nanosensors to image neurochemistry.* Gottingen, Germany (July 2025)
19. **University of California Riverside Seminar (Invited):** *Plant homeoproteins for protein delivery to plants.* Riverside, CA (May 2025)
20. **Georgia Institute of Technology Seminar (Invited):** *Development of Neurochemical Probes to Image Brain Chemistry.* Atlanta, GA (April 2025)
21. **Northwestern University Department of Biology Seminar (Student Invited Speaker):** *Development of Neurochemical Probes to Image Brain Chemistry.* Chicago, IL (April 2025)
22. **Arizona State University Department of Materials Science Seminar (Invited):** *Development of Neurochemical Probes to Image Brain Chemistry.* Tempe, AZ (April 2025)
23. **Howard Hughes Medical Institute Janelia Research Campus: Genetic tools for new model organisms (Invited):** *Non-genetic tools for non-model organisms.* Ashburn, VA (October 2024)
24. **University of Maryland Plant Science and Landscape Architecture Seminar (Invited):** *Nanomaterials for delivery of biomolecules to plants.* College Park, MD (March 2025)
25. **Arizona State University Department of Chemical Engineering Seminar (Invited):** *Development of Neurochemical Probes to Image Brain Chemistry.* Tempe, AZ (February 2025)
26. **CRISPR Ag Biotech Congress (Invited):** *Strategies for protein delivery to plants.* Raleigh, NC (February 2025)
27. **WeSTEM conference (Invited):** *Convoluting paths into science: how to shape your career path with best practices in professional development.* Urbana Champaign, Illinois (February 2025)
28. **Advanced Imaging Methods (Invited):** *Near-infrared imaging to understand brain chemistry imbalances.* Berkeley, CA (January 2025)
29. **Brown University Chemistry Seminar (Invited):** *Imaging neurochemistry with nanosensors.* Providence, RI (January 2025)
30. **SynBYSS Conference (Invited Keynote):** *Nanomaterials for delivery of biomolecules to plants.* Honolulu, HI (December 2024)
31. **University of Illinois at Urbana-Champaign Physics Seminar (Invited):** *Development of Neurochemical Probes to Image Brain Chemistry.* Champaign, IL (November 2024)

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32. **University of Illinois at Urbana-Champaign Chemistry Seminar (Student Invited Speaker):** *Nanomaterials for delivery of biomolecules to plants.* Champaign, IL (November 2024)
33. **Drug Carriers in Medicine and Biology Gordon Research Conference (Invited):** *Protein corona formation on lipid nanoparticles and implications for nanoparticle cellular entry.* Portland, ME (August 2024)
34. **International Conference on Plant Nanotechnology 2024 (Invited):** *Nanoparticles for DNA, RNA, and protein delivery to plants.* Poznan, Poland (October 2024)
35. **Society for Neuroscience Presidential Lecture (Invited):** *Illuminating brain chemistry to advance neurobiology.* Chicago, IL (October 2024)
36. **Blavatnik Foundation National Awards For Young Scientists (Invited):** *Nanotechnologies for life sciences applications.* New York, NY (October 2024)
37. **Columbia University Department of Chemical Engineering Student-Selected Colloquium Speaker (Invited):** *Nanotechnologies to illuminate brain chemistry.* New York, NY (September 2024)
38. **Drug Carriers in Medicine and Biology Gordon Research Conference (Invited):** *Protein corona formation on lipid nanoparticles and implications for nanoparticle cellular entry.* Portland, ME (August 2024)
39. **Nanoscale Science and Engineering for Agriculture and Food Systems Gordon Research Conference (Invited):** *DNA, RNA, and protein delivery with nanomaterials.* Manchester, NH (June 2024)
40. **Basal Ganglia Gordon Research Conference (Invited):** *Nanosensors for imaging brain chemistry.* Ventura, CA (March 2024)
41. **University of Colorado Boulder (Invited):** *Nanomaterial Strategies for plant bioengineering.* Boulder, CO (December 2023)
42. **University of Colorado Boulder (Invited):** *Near infrared imaging of neuromodulators in the brain.* Boulder, CO (December 2023)
43. **Colorado State Materials Science Department (Invited):** *Near infrared imaging of neuromodulators in the brain.* Fort Collins, CO (November 2023)
44. **Colorado State Plant Biology Department (Invited):** *Nanoparticles enable plant genetic engineering without transgene integration.* Fort Collins, CO (November 2023)
45. **MIT Bioengineering Department Seminar (Invited):** *Nanoparticles enable plant genetic engineering without transgene integration.* Boston, MA (November 2023)
46. **10<sup>th</sup> Plant Genomic & Gene Editing Congress (Invited):** *Nanomaterial Strategies for RNA and protein delivery in plants.* Raleigh, NC (October 2023)
47. **Mellichamp Award Lectureship, Purdue Chemical Engineering (Invited Named Lecture Series Speaker):** *Nanoparticles enable plant genetic engineering without transgene integration.* West Lafayette, IN (August 2023)
48. **Pennsylvania State University Materials Science Department Seminar (Invited):** *Nanoparticles enable the delivery of genetic material to plants without transgene integration.* State College, PA (October 2023)
49. **Memorial Sloan Kettering Cancer Center of Molecular Pharmacology and & Chemical Biology Seminar (Invited):** *Near infrared nanosensors to image neurochemistry in the brain.* New York, NY (September 2023)
50. **Stanford University Department of Chemistry (Invited):** *Nanoparticles enable the delivery of genetic material to plants without transgene integration.* Stanford, CA (September 2023)
51. **Fluorescent Proteins and biological Sensors, HHMI Research Campus (Invited):** *Imaging neuromodulation in the brain with near-infrared nanosensors.* Ashburn, Virginia (August 2023)
52. **Euroanalysis (Invited Keynote Speaker):** *Imaging neuromodulators with near infrared nanosensors.* Geneva, Switzerland (August 2023)
53. **Kyoto University Department of Chemistry (Invited):** *Nanomaterials enable delivery of genetic materials to plants without transgene integration.* Kyoto, Japan (July 2023)
54. **National Academies of Engineering JAFGE (Invited):** *Nanomaterials for life sciences applications.* Tokyo, Japan (July 2023)

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55. **Nano Korea (Invited Keynote):** *Nanoparticles for the delivery of nucleic acids and proteins in plants.* Seoul, South Korea (July 2022)
56. **NT23 (Invited Plenary Speaker):** *Imaging neuromodulators and their implications in Huntington's Disease.* Bordeaux, France (June 2023)
57. **Electrochemical Society Meeting (Invited):** *Protein corona formation on single-walled carbon nanotubes.* Boston, MA (May 2023)
58. **MIT Chemical Engineering Seminar Series (Invited):** *Nanoparticles enable plant genetic engineering without transgene integration.* Boston, MA (February 2023)
59. **Nano Today 2023 (Invited):** *Nanoparticles enable plant editing without transgene integration.* San Diego, CA (February 2023)
60. **Harvard University Physics Seminar Series (Invited):** *Nanotechnology for life sciences applications.* Boston, MA (February 2023)
61. **Max Planck Humboldt Foundation Seminar (Invited):** *Nanobiotechnology for medicinal plant bioengineering.* Berlin, Germany (February 2023)
62. **Honorary Morgan Lecture - Texas Christian University (Invited Named Lecture Series):** *Nanotechnology for life sciences applications.* Fort Worth, Texas (January 2023)
63. **Weber Meeting (Invited):** *Imaging neuromodulators with near infrared nanosensors.* Punta Del Este, Uruguay (January 2023)
64. **Atlantic Basin Conference on Chemistry (Invited):** *Imaging neuromodulators with near infrared nanosensors.* Marrakesh, Morocco (December 2022)
65. **Colorado State Department of Plant Biology (Invited):** *Nanoparticles for the delivery of nucleic acids and proteins in plants.* Fort Collins, CO (November 2022)
66. **Frontiers of Neurophotonics (Invited):** *Imaging neuromodulators with near infrared nanosensors.* Quebec City, QC (October 2022)
67. **Stanford University Department of Chemical and Biomolecular Engineering (Invited):** *Nanoparticles for the delivery of nucleic acids and proteins in plants.* Stanford, CA (September 2022)
68. **Nano DDS (Invited):** *Nanoparticles for the delivery of nucleic acids and proteins in plants.* Chapel Hill, NC (September 2022)
69. **Johns Hopkins University Department of Chemical and Biomolecular Engineering (Invited):** *Nanoparticles for the delivery of nucleic acids and proteins in plants.* Baltimore, MD (September 2022)
70. **WONTON 2022 (Invited):** *Carbon nanotubes to image neuromodulators in the brain.* Madison, WI (July 2022)
71. **Frontiers of Genome Engineering (Invited):** *Nanomaterials enable the delivery of genetic information into plants without transgene integration.* Seoul, South Korea (June 2022)
72. **Dopamine 2022 (Invited):** *Dopamine imaging with near infrared nanosensors.* Lyon, France (June 2022)
73. **Electrochemical Society Meeting B02 Session (Invited):** *Protein Corona Formation on Hard and Polymeric Nanoparticles – Towards Understanding Biocompatibility, Biodistribution, and Efficacy.* Vancouver, Canada (May 2022)
74. **Lawrence Berkeley National Laboratory Molecular Foundry Seminar (Invited):** *Nanomaterials Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants.* Berkeley, CA (May 2022)
75. **University of Illinois at Urbana Champaign Materials Science Department Seminar (Invited):** *Nanomaterials Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants.* Urbana, IL (February 2022)
76. **University of California Riverside Department of Plant Biology (Invited):** *Nanomaterials Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants.* Riverside, CA (April 2022)
77. **Basal Ganglia Gordon Research Conference (Invited):** *Near Infrared Imaging of Neurotransmission in the Brain.* Ventura, CA (March 2022)

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78. **University of British Columbia Department of Chemistry Seminar (Invited):** *Nanomaterials Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants*. Vancouver, British Columbia (February 2022)
79. **North Carolina Biotechnology Center (NCBC) (Invited):** *Nanomaterials Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants*. Raleigh, NC (January 2022)
80. **NYU Abu Dhabi Department of Chemistry (Invited):** *Nanomaterials Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants*. Abu Dhabi, United Arab Emirates. (November 2021)
81. **Genentech Seminar Series (Invited):** *Diverse solutions for life's most challenging problems – from nanotechnology to inclusion and belonging in STEM*. San Francisco, CA. (August 2021)
82. **Reliance Industries Biofuel and Synthetic Biology Seminar Series (Invited):** *Nanomaterials Engineering for Biomolecule Delivery to Plants*. Mumbai, India. (June 2021)
83. **IEEE Nanotechnology Council (Invited):** *Nanomaterials-based extraction of SARS-CoV2 viral RNA*. San Francisco, CA. (June 2021)
84. **NT21: International Conference on the Science and Application of Nanotubes and Low-Dimensional Materials (Invited):** *Carbon Nanotubes Enable Delivery of Biomolecules to Plants Without Transgene Integration*. Houston, TX. (June 2021)
85. **ACS Innovation in Measurement Science Symposium (Invited Keynote):** *Nanomaterials for Imaging Neuromodulation in the Brain*. Boston, MA. (June 2021)
86. **University of Minnesota NIH Chemistry-Biology Interface Research Symposium. (Invited):** *Nanomaterials Engineering for Biomolecule Delivery to Plants*. Minneapolis, MN. (May 2021)
87. **ECS 239th Meeting - 2021 - Carbon Nanostructures in Medicine and Biology Symposium (Invited):** *A Protein Corona-Based Design Strategy for Carbon Nanotube Sensors*. Chicago, IL. (May 2021)
88. **ECS 239th Meeting - 2021 - 2020 Nanocarbons Division SES Young Investigator Award (Invited):** *Nanomaterials Engineering to Probe and Control living Systems*. Chicago, IL. (May 2021)
89. **UCLA Department of Chemistry and Biochemistry Seminar (Invited):** *Tiny things to engineer solutions for life's big problems*. Los Angeles, CA. (May 2021)
90. **3M Seminar Series (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. St. Paul, MN. (April 2021)
91. **University of Florida Department of Chemical Engineering Seminar (Invited):** *Nanomaterials to probe and control biological systems*. Gainesville, FL. (April 2021)
92. **University of Cincinnati Chemistry (Invited):** *Tiny things to engineer solutions for life's big problems*. Cincinnati, OH. (April 2021)
93. **Rowan University Physics Department Seminar (Invited):** *Tiny things to engineer solutions for life's big problems*. Glassboro, NJ. (March 2021)
94. **Carnegie Mellon University Department of Materials Science and Engineering Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. Pittsburgh, PA. (February 2021)
95. **Harvard University School of Engineering and Applied Sciences Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. Pittsburgh, PA. (January 2021)
96. **University of California Riverside Plant Sciences Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration*. Riverside, CA. (January 2021)
97. **Max Planck Institute of Biochemistry (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration*. Munich, Germany. (January 2021)
98. **Corteva Plant Breeding, Genetics, and Biotechnology (PBGB) symposium, Michigan State University (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration*. East Lansing, MI. (December 2020)
99. **University of California Berkeley Department of Molecular and Cellular Biology Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. Berkeley, CA. (December 2020)

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100. **Pacificchem 2020 (Invited):** *Imaging Striatal Dopamine Release with a Non-Genetically Encoded Near- Infrared Fluorescent Nanosensor.* Honolulu, HI. (December 2020) \*Postponed due to covid-19
101. **Pacificchem 2020 (Invited):** *Carbon Nanotubes Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants.* Honolulu, HI. (December 2020) \*Postponed due to covid-19
102. **Plant Sciences Institute, Israeli National Center for Genome Editing in Agriculture (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Rishon, Israel (November 2020)
103. **Naval Research Laboratory Center for Bio/Molecular Science and Engineering (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* (November 2020)
104. **Sustainable Nanotechnology Organization Meeting (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Virtual meeting. (November 2020)
105. **ACS Nano Rising Star Symposium (Invited):** *Engineering Nanomaterials for Biotechnology.* Beijing, China. (November 2020)
106. **NANO FOR AGRI 2020: Application of Nanotechnology for Sustainable, Productive and Safer Agriculture and Food Systems, TERI-Deakin Nanobiotechnology Centre 2020 (Invited):** *Nanomaterials Enable Delivery of Genetic Material Without Transgene Integration in Mature Plants.* Gurugram, India. (November 2020)
107. **AIChE Annual Meeting, Bionanotechnology Division (Invited Plenary):** *Nanomaterials Engineering to Probe and Control Living Systems.* San Francisco, CA. (November 2020)
108. **Carnegie Mellon University Department of Chemical Engineering Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems.* Pittsburgh, PA. (November 2020)
109. **AIChE Annual Meeting, Food, Pharmaceutical, and Bioengineering Division (Invited Plenary):** *Imaging Striatal Dopamine Release with a Non-Genetically Encoded Near-Infrared Fluorescent Nanosensor.* San Francisco, CA. (November 2020)
110. **UNC Eshelman School of Pharmacy – Rising Stars in Drug Delivery and Novel Carriers Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Chapel Hill, NC. (November 2020)
111. **AIChE Annual Meeting, Education Division (Invited):** *Integration of Professional Development Practices in Doctoral and Postdoctoral Training – Approaches for Supporting Career Navigation in Chemical Engineering.* San Francisco, CA. (November 2020)
112. **Rice University Department of Bioengineering Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems.* Houston, TX (October 2020)
113. **NIMH 2020 Symposium “Advancing Technologies to Investigate Mechanisms of Gut-Microbiota-Brain Interaction (Invited):** *Imaging Neuromodulators with Near Infrared Nanosensors.* Stockholm, Sweden (October 2020)
114. **Plant Genome Editing Symposium – Society for the Advancement of Chicanos and Native Americans In Science, SACNAS (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Long Beach, CA. (October 2020)
115. **4<sup>th</sup> International Conference on Plant Synthetic Biology, Bioengineering, and Biotechnology (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* College Copenhagen, Denmark. (October 2020)
116. **Texas A&M Genome Editing Symposium (Invited Keynote):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* College Station, TX. (October 2020)
117. **8<sup>th</sup> Plant Genomics & Gene Editing Congress (Invited Keynote):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Raleigh, NC. (October 2020) \*Postponed due to covid-19
118. **2020 Frontiers in Neurophotonics Conference (Invited):** *Imaging neuromodulation with synthetic near-infrared nanosensors.* Quebec City, QC. (October 2020) \*Canceled due to covid-19
119. **Department Biomedical Engineering at City College New York Seminar (Invited):** *Nanotechnologies for life's big problems.* New York, NY. (September 2020)

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120. **ETH Zurich Department of Biology (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Zurich, Switzerland. (September 2020)
121. **SciX 2020 Conference (Invited Keynote):** *Emerging Leader in Molecular Spectroscopy: Nanomaterials Engineering for Life Science Applications.* Sparks, NV. (September 2020)
122. **Pennsylvania State University Department of Biology Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* State College, PA. (September 2020)
123. **Mid Atlantic Plant Molecular Biology Society Meeting (Invited Named Keynote - The Leslie Wanner Keynote speaker):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Baltimore, MD. (August 2020)
124. **2020 ACS National Meeting, JACS Spotlight on Chemistry from Bench to Market (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* San Francisco, CA. (August 2020)
125. **2020 Biological Physics/Physical Biology virtual seminar series (Invited):** *Tiny things to engineer solutions for life's big problems,* Virtual Seminar (July 2020)
126. **Carnegie Plant Cell Atlas (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Stanford, CA. (June 2020)
127. **2020 Gordon Research Conference on Nanotechnology in Food & Agriculture (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Manchester, NH. (June 2020) \*Canceled due to covid-19
128. **Monitoring Molecules in Neuroscience (Invited):** *Imaging Dopamine in Huntington's Disease Neurodegeneration and Treatment.* Lyon, France (June 2020) \*Canceled due to covid-19
129. **Carnegie Institute Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems.* Stanford, CA (May 2020)
130. **Dopamine 2020 (Invited):** *Imaging Striatal Dopamine with a Near-Infrared Fluorescent Nanosensor.* Montreal, QC, Canada (May 2020) \*Canceled due to covid-19
131. **2020 ECS Nanocarbons Division Young Investigator Award Symposium (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems.* Montreal, QC, Canada (May 2020) \*Canceled due to covid-19
132. **PROTEO 2020 Annual Symposium, Université Laval (Invited Keynote):** *Imaging Intercellular Communication with Synthetic Optical Probes.* Quebec City, QC, Canada (May 2020)
133. **2020 West Coast Innovation Forum (Invited):** *Breakthroughs in biotechnology.* Davis, CA (April 2020) \*Canceled due to covid-19
134. **MIT Chemical Engineering Seminar (Invited – Student-selected invited speaker):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Cambridge, MA (April 2020)
135. **Cornell University Chemical Engineering Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Ithaca, NY (April 2020)
136. **University of Rhode Island Department of Chemical Engineering Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems.* Kingston, RI (March 2020) \*Canceled due to covid-19
137. **University of Georgia Department of Plant Biology Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Athens, GA (March 2020) \*Canceled due to covid-19
138. **7<sup>th</sup> International Winterschool on Bioelectronics, BioEL2020 (Invited):** *Nanomaterials for Neuromodulator Imaging.* Kirchberg in Triol, Austria (March 2020) \*Canceled due to covid-19
139. **RIKEN Chemistry and Plant Biology Symposium (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Tokyo, Japan (March 2020) \*Canceled due to covid-19
140. **2020 Basal Ganglia Gordon Research Conference Discussion Leader (Invited):** *New tools and trends for imaging neuromodulation.* Ventura, CA (March 2020) \*Canceled due to covid-19
141. **UC Santa Barbara Department of Chemistry Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Santa Barbara, CA (March 2020)

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142. **National Academies of Sciences US-UK Scientific Forum on Sustainable Agriculture (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Washington, DC (March 2020)
143. **San Francisco Neurological Society Annual Meeting (Invited):** *Imaging neuromodulation with synthetic nanosensors.* Monterrey, CA (March 2020) \*Canceled due to covid-19
144. **PittConn 2020 (Invited):** *A near-infrared fluorescent nanosensor enables high spatial resolution imaging of dopamine release in striatal brain tissue.* Pittsburg, PA (March 2020) \*Canceled due to covid-19
145. **University of Tennessee Knoxville Department of Agricultural Synthetic Biology Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* Knoxville, TN (February 2020)
146. **Chan-Zuckerberg Biohub Deep Imaging Conference (Invited):** *Challenges and Opportunities for Imaging Neuromodulation.* San Francisco, CA (January 2020)
147. **Penn State Department of Plant Biology Seminar (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* State College, PA (January 2020)
148. **Plant Animal Genomics (PAG) Conference, Bayer Inc Session on Transgenic Technology for Agriculture (Invited):** *Nanomaterials enable delivery of genetic material to plants without transgene integration.* San Diego, CA (January 2020)
149. **2020 UC San Diego Cell and Molecular Genetics Symposium (Invited):** *Delivery of Genetic Material to Plants without Transgene Integration.* La Jolla, CA (January 2020)
150. **NIH Chemogenetic Innovations in the Manipulation and Monitoring of Labeled Neurons Workshop (Invited):** *Probes and Activity Monitoring of Brain Neuromodulation.* Washington, DC (December 2019)
151. **NSF Nanoscale Science and Engineering Grantees Conference (Invited):** *Understanding Brain Neurochemistry: Imaging Neuromodulators with High Spatiotemporal Resolution.* Alexandria, VA (December 2019)
152. **Corteva, Inc. Company Seminar Series (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants.* Johnston, IA (December 2019)
153. **Stanford University Materials Science Department Seminar (Invited):** *Nanotechnologies for life's big problems.* Stanford, CA (December 2019)
154. **Materials Research Society (MRS): Smart Materials, Devices, and Systems to Interface with Plants and Microorganisms (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants.* Boston, MA (December 2019)
155. **The American University in Cairo (Invited):** *Understanding Brain Neurochemistry: Imaging Neuromodulators with High Spatiotemporal Resolution.* Cairo, Egypt (November 2019)
156. **International Tropical Agriculture Conference (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants.* Brisbane, Australia (November 2019)
157. **Society for the Advancement of Chicanos and Native Americans In Science (Invited):** *Tiny Solutions to Help Solve Life's Big Problems.* Honolulu, HI (October 2019)
158. **Rijk Zwaan, Inc. Company Seminar Series (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants.* Berkeley, CA (October 2019)
159. **Koc University Department of Chemical Engineering Seminar (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants.* Istanbul, Turkey (October 2019)
160. **Istanbul Technical University International Biology and Genetics Congress (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants.* Istanbul, Turkey (October 2019)
161. **Pairwise, Inc. Company Seminar Series (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants.* Raleigh, NC (September 2019)

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162. **ACS Talented Twelve Symposium (Invited):** *Tiny Solutions to Help Solve Life's Big Problems*. San Diego, CA (August 2019)
163. **Danforth Plant Science Center (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants*. Saint Louis, MO (August 2019)
164. **American Society for Plant Biology Plenary Keynote (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants*. San Jose, CA (August 2019)
165. **McGill University Faculty of Engineering (Invited):** *DNA and RNA Delivery with Nanomaterials in Mature Plants*. Montreal, QC (July 2019)
166. **RIKEN Center for Brain Science (Invited):** *Nanotechnology – Understanding the Brain in Both Health and Disease*. Tokyo, Japan (July 2019)
167. **Terramera, Inc. Company Seminar Series (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery Without DNA Integration in Mature Plants*. Vancouver, BC (July 2019)
168. **Parkinson's Disease Gordon Research Conference (Invited):** *Imaging Striatal Dopamine Release Using a Non-Genetically Encoded Near-Infrared Fluorescent Nanosensor*. Newry, ME (June 2019)
169. **Bioelectronics Gordon Research Conference (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. Andover, NH (June 2019)
170. **Society for In Vitro Biology (Invited Keynote):** *High Aspect Ratio Nanomaterials Enable Delivery of Functional Genetic Material Without DNA Integration in Mature Plants*. Tampa, FL (June 2019)
171. **Electrochemical Society Meeting (Invited):** *DNA Library Evolution of Carbon Nanotube Molecular Recognition*. Dallas, TX (May 2019)
172. **Umeå Plant Science Centre Seminar (Invited):** *High Aspect Ratio Nanomaterials Enable Delivery of Functional Genetic Material Without DNA Integration in Mature Plants*. Umeå, Sweden (May 2019)
173. **2019 Yale Chemical Biology Symposium (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. New Haven, CT (May 2019)
174. **UC Berkeley Department of Bioengineering Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. Berkeley, CA (May 2019)
175. **AIChE Midwest Meeting (Invited Keynote):** *Nanomaterials Engineering to Probe and Control Living Systems*. Chicago, IL (March 2019)
176. **Rockefeller University Center for Studies in Physics and Biology Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. New York, NY (February 2019)
177. **Memorial Sloan Kettering Cancer Center of Molecular Imaging and Nanotechnology Seminar (Invited):** *Nanomaterials Engineering to Probe and Control Living Systems*. New York, NY (February 2019)
178. **UCSD Plant Biology Symposium (Invited):** *Genetic Transformation of Plants with Nanoparticles*. San Diego, CA (January 2018)
179. **University of Washington Department of Chemical Engineering Seminar (Invited):** *Imaging Striatal Dopamine Release Using a Non-Genetically Encoded Near-Infrared Fluorescent Nanosensor*. Seattle, WA (January 2019)
180. **Kavli Sensing the Future Workshop (Invited):** *Imaging Striatal Dopamine Release Using a Non-Genetically Encoded Near-Infrared Fluorescent Catecholamine Nanosensor*. Houston, TX (December 2018)
181. **American Institute of Chemical Engineers (Invited):** *Exciton Engineering for Brain Nanosensor Delivery and Imaging of Modulatory Neurotransmitters*. Pittsburgh, PA (October 2018)
182. **University of Washington Department of Chemistry Seminar (Invited):** *Infrared Nanosensors for Imaging Dopamine Dynamics in the Brain*. Seattle, WA (October 2018)
183. **KAUST Plant Sciences Seminar (Invited):** *High Aspect Ratio Nanomaterials Enable Transgene Expression and Silencing in Plants*. Thuwal, Saudi Arabia (September 2018)

184. **Asilomar Bioelectronics Symposium (Invited):** *Imaging Brain Neurochemistry with Non-Genetically Encoded Near-Infrared Fluorescent Nanosensors.* Carmel, CA (September 2018)
185. **American Chemical Society Early Career Investigators in Biological Chemistry:** *Imaging Brain Neurochemistry with Non-Genetically Encoded Near-Infrared Fluorescent Nanosensors.* Boston, MA (August 2018)
186. **American Chemical Society Applied Nanotechnology for Food & Agriculture:** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery and Transgene Expression or Silencing in Mature Plants.* Boston, MA (August 2018)
187. **Gordon Research Conference: Optogenetic Approaches to Understanding Neural Circuits and Behavior (Invited):** *Imaging Striatal Dopamine Release using a Non-Genetically Encoded Near-Infrared Fluorescent Catecholamine Nanosensor.* Newry, ME (July 2018)
188. **Northwestern University, Feinberg School of Medicine Seminar (Invited):** *Optical Detection of Striatal Dopamine with a Near-Infrared Fluorescent Catecholamine Nanosensor.* Evanston, IL (June 2018)
189. **University of California Davis, Chemical Engineering Department Seminar (Invited):** *Nanomaterials Engineering for Life Sciences Applications.* Davis, CA (May 2018)
190. **Electrochemical Society Meeting (Invited):** *High Aspect Ratio Nanomaterials Enable Transgene Expression and Silencing in Plants.* Seattle, WA (May 2018)
191. **DuPont Plant Sciences Symposium (Invited):** *High Aspect Ratio Nanomaterials Enable Transgene Expression and Silencing in Plants.* Berkeley, CA (April 2018)
192. **Innovative Genomics Institute (Invited):** *High Aspect Ratio Nanomaterials Enable Biomolecule Delivery into Plants.* Berkeley, CA (April 2018)
193. **University of North Carolina at Chapel Hill, Biomedical Engineering Department Seminar (Invited):** *Nanotechnology for Life Sciences Applications.* Chapel Hill, North Carolina (March 2018)
194. **US-Brazil Workshop on Biosensors: Bioanalytics to Device Integration (Invited):** *Neurochemical Imaging for Validation of Antidepressants.* Sao Paulo, Brazil (November 2017)
195. **AVS 2018 National Meeting, Biointerfaces Division (Invited):** *Visualization of Neuromodulation with Infrared Fluorescence Microscopy.* Tampa, FL (November 2017)
196. **New York University, Lagone Medical Center Seminar (Invited):** *Imaging Brain Neuromodulation with Infrared Nanosensors.* New York, NY (October 2017)
197. **SciX Conference (Invited):** *Engineering Excitons for Imaging Neuromodulation in the Brain.* Reno, NV (October 2017)
198. **University of San Francisco, Physics Department Seminar (Invited):** *Tiny Tools to Solve Big Biomolecular Challenges.* San Francisco, CA (September 2017)
199. **International Rice Research Institute, IRRI Seminar (Invited):** *Plant Genome Editing via Nanomaterial-Scaffolded Biomolecule Delivery.* Los Banos, Philippines (July 2017)
200. **Inari, Inc (Invited):** *Passive Mature Plant Transformation with High Aspect Ratio Nanoparticles.* Boston, MA (June 2017)
201. **Georgetown University Physics Department Seminar (Invited):** *Engineering and Imaging Excitons for Brain Imaging of Modulatory Neurotransmitters.* Washington, DC (June 2017)
202. **Electrochemical Society Meeting 2017 (Invited):** *Nanosensors for Modulatory Neurotransmission Imaging.* New Orleans, LA (June 2017)
203. **Gettysburg College Physics Department Seminar (Invited):** *Exciton Engineering for Imaging Neuromodulatory Transmission.* Gettysburg, PA (March 2017)
204. **International Conference on Plant Synthetic Biology and Bioengineering (Invited):** *Nanoparticles as Biomolecular Cargo Transporters in Plants.* Miami, FL (December 2016)
205. **George Mason University Physics Department Seminar (Invited):** *Imaging Neurochemistry with Synthetic Fluorescent Nanosensors.* Washington, DC (October 2016)

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206. **Quantitative Cell Profiling Symposium: Single-Molecule Detection of Protein Efflux from Isolated Microorganisms using Fluorescent Single Walled Carbon Nanotube Sensor Arrays.** Osaka, Japan (September 2016)
207. **Lawrence Berkeley National Laboratory Molecular Foundry (Invited): Nanoparticle-Polymer Conjugates for Near-Infrared Biomolecular Detection.** Berkeley, CA (August 2016)
208. **New York University Langone Medical Center Seminar (Invited): Synthetic Infrared Nanosensors for Modulatory Neurotransmitters.** New York, NY (July 2016)
209. **University of Texas El Paso Chemistry Department Seminar (Invited): Molecular Predictions and Computational Approaches to Understanding Chemical Neurotransmission.** El Paso, TX (April 2016)
210. **Brain and Behavior Research Foundation Spring Foundation (Invited): Understanding How Brain Cells Communicate – And Sometimes Miscommunicate.** West Palm Beach, FL (February 2016)

### RESEARCH EXPERIENCE

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- **Massachusetts Institute of Technology:** Chemical Engineering  
*Michael Strano, Primary Advisor.* (2013 – 2016) – [Strano Research Group](#)  
Synthesis of nano-scale optical sensors and development of molecular fluorescence imaging microscopes.
- **University of Illinois Graduate Student:** Chemical Physics  
*Yann Chemla, Primary Advisor.* (2007 –2012) – [Chemla Lab](#)  
Design and construction of single-molecule instrumentation: optical traps and fluorescence microscopy. I studied telomerase protein systems and DNA-nanotube interactions.
- **Junior Nanotechnology Network Fellow:** Technische Universität München  
Ludwig-Maximilians-Universität. (2010 –2010)  
I worked with Don Lamb, Matthias Rief, Hendrik Dietz, and Hermann Gaub to develop techniques for probing biological systems and nanomaterials at the single-molecule scale.
- **University of Illinois Business Consulting:** Consultant. (January 2010 – May 2010)  
Managed a team of doctoral and business students in an interdisciplinary setting to perform market research analysis for the creation of a startup technological company.
- **Osaka University Visiting Research Fellow:** Nanobiology  
*Toshio Yanagida laboratory.* (2009) – [Yanagida Soft Biosystem Group](#)  
My research in the Yanagida group centered on optimizing sub-diffraction limited imaging (FIONA) for protein-DNA dynamic studies with Total Internal Reflection Fluorescence Microscopy.
- **Duke University Research Assistant:** Pharmacology & Cancer Biology  
*Madan Kwatra laboratory.* (2007) – [Kwatra Laboratory](#)  
My research in the Kwatra group was based on a quantitative study of G protein-coupled receptors as they relate to postoperative delirium in elderly patients.
- **University of North Carolina at Chapel Hill Research Assistant:** Biochemistry and Biophysics.  
*Brian Kuhlman laboratory.* (2002 –2006) – [Kuhlman Lab](#)  
My research in the Kuhlman group centered on the study of protein - protein interaction energies in the ubiquitin protein network by expressing protein mutants and performing protein kinetic assays.

### TEACHING EXPERIENCE

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- **NEUROSC 152: Neurotechnology** (Spring 2025) – [Syllabus](#)  
*University of California, Berkeley department of Neuroscience*  
Topics covered neurotechnologies to study neurobiology including extracellular electrophysiology, neuronal recording and stimulation, wireless communication, electron and fluorescence microscopy, neurochemical activity imaging and neurochemical imaging.
- **CBE 141: Chemical Engineering Thermodynamics: Instructor** (Spring 2017, 2018) – [Syllabus](#)  
*University of California, Berkeley department of Chemical and Biomolecular Engineering*

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Topics covered thermodynamic behavior of pure substances and mixtures, properties of solutions, phase equilibria, thermodynamic cycles, and chemical equilibria for homogenous and heterogenous systems.

- **CBE 182: Nanoscience and Engineering Biotechnology: Instructor** (Fall 2017, Fall 2018, Spring 2020, Fall 2021) – [Syllabus](#)  
*University of California, Berkeley department of Chemical and Biomolecular Engineering*  
Topics covered molecular biology, protein folding thermodynamics, protein and enzyme engineering, recombinant DNA technology, nanomaterials synthesis, nanodevices, nanotechnology.
- **CBE 154: Unit Operations for Chemical Engineering: Instructor** (Fall 2016, Spring 2019) – [Syllabus](#)  
*University of California, Berkeley department of Chemical and Biomolecular Engineering*  
This undergraduate course is one of two capstone courses in the chemical engineering curriculum, with a focus on experimental design for topics in thermodynamics and transport phenomena.
- **NEUROSC 290A: Neuroscience Research Methods and Professional Development: Co-instructor** (Fall 2017, Fall 2018)  
*University of California, Neuroscience Graduate Program*  
This graduate course is offered to first-year doctoral students in the UC Berkeley neuroscience graduate program. Topics covered include neuroscience research methods including classical experimental tools, data analysis, and data interpretation.
- **MCB 293C** (Spring 2019)  
*University of California, Berkeley department of Molecular and Cellular Biology*  
This graduate course covers topics in research best practices and responsible conduct in research drawing from case studies from the Association of American Medical Colleges and the NIH.
- **Clubes de Ciencias (CdeC) Mexico: Instructor** (2014 - 2015) – [Course website](#)  
*Universidad Nacional Autónoma de México*  
Designed and taught an optics course for low-income university freshmen students in Ensenada, Mexico. Worked with Universidad Nacional Autónoma de México to remotely serve as a mentor for students.
- **Engineering Nanotechnology Co-Instructor:** (Fall 2013 & 2015)  
*Massachusetts Institute of Technology department of Chemical Engineering*  
Developed course materials for imaging and materials passivation techniques used in the field of engineering and nanomaterials science. Gave course lectures and prepared course handouts.
- **Center for the Physics of Living Cells Instructor:** (Summers 2009 – 2011)  
*University of Illinois at Urbana Champaign department of Physics*  
Led week-long intensive course for visiting graduate students and scientists, on the construction and use of a single-molecule total internal reflection fluorescence microscope and single-molecule optical trap.
- **Junior Nanotechnology Network Instructor:** (Summer 2010)  
*University of Illinois at Urbana Champaign department of Physics*  
Instructed 15 graduate students on the construction and biological applications of single-molecule fluorescence and force microscopy.
- **Advanced Thermodynamics and Statistical Mechanics Teaching Assistant:** (Spring 2008)  
*University of Illinois at Urbana Champaign department of Chemistry*  
Gave upper-level undergraduate student lectures, supplemental instruction sessions.
- **General Chemistry Teaching Assistant:** (Fall 2007)  
*University of Illinois at Urbana Champaign department of Chemistry*
- **Introductory Electrodynamics Teaching Assistant:** (Fall 2006 – 2007)  
*University of Illinois at Urbana Champaign department of Physics*
- **Introductory Mechanics Teaching Assistant:** (Spring 2006 – 2007)  
*University of North Carolina at Chapel Hill department of Physics*
- **General Chemistry Laboratory Teaching Assistant:** (Fall 2006)  
*University of North Carolina at Chapel Hill department of Chemistry*

## CERTIFICATIONS

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## Markita Patricia del Carpio Landry

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2010 Certified LabVIEW Associate Developer (CLAD)  
2009 Certificate in Business Administration, University of Illinois College of Business

### PROFESSIONAL SOCIETY MEMBERSHIPS

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- American Institute of Chemical Engineers
- American Society for Cell Biology
  - Minority Affairs Committee
- Biophysical Society
- Society for the Advancement of Chicanos and Native Americans in Science
- Electrochemical Society
- American Chemical Society
- American Physical Society
- Biomedical Engineering Society

### TRAINEES

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#### (1) POSTDOCTORAL SCHOLARS

##### • Current

- Shoichi Nishitani (June 2021 – present)
- Jaewan Mun (February 2021 – present)
- Eduardo Gonzales Grandio (April 2019 – present)
- Roxana Coreas (October 2022 – present)
- Natsumi Komatsu (February 2023 – present)
- Kevin Ao (August 2023 – present)
- Kirill Schenstniy (May 2026 - present)
- Lining Zheng (May 2026 - present)
- Anni Shi (August 2025 – present)
- Brendan Butler (October 2025 - present)
- Hideaki Uchida (December 2025 - present)

##### • Former

- Dabin Yim (April 2022 – April 2025)
- Juliana de Lima Matos (June 2021 – July 2024)
- Mohammed Moein Safaei (May 2021 – May 2022)  
Current affiliation: Principal Scientist at AbbVie
- Eduardo Gonzales Grandio (April 2019 – December 2021)  
Current affiliation : Principal Scientist at [National Center for Biotechnology](#)
- Ian McFarlane (February 2016 – April 2021)  
Current affiliation : Senior Diagnostics Software Engineer at [KLA](#)
- Sanghwa Jeong (February 2016 – January 2021)  
Current affiliation : Assistant Professor, [Pusan National University, School of Biomedical Engineering](#)
- Huan Zhang (February 2016 – July 2020)  
Current affiliation: Assistant Professor, [Jinan University Department of Chemistry and Materials Science](#)
- Travis del Bonis O'Donnell (February 2016 – August 2020)  
Current affiliation: Scientist, [Quantapore](#)
- Younghun Sung (February 2016 – April 2019)  
Current affiliation: Samsung Electronics Semiconductor R&D Institute
- David Pieraski (March 2016 – December 2018)  
Current affiliation: Advanced Health Fellow, Department of Veterans Affairs, Palo Alto
- Junchen Wu (March 2016 – May 2017)  
Current affiliation: Assistant Professor, [East China University of Science and Technology](#)

#### (2) GRADUATE STUDENTS

##### • Current

- Jaquesta Adams (May 2020 – present)
- Henry Squire (August 2021 – present)

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- Sophia Tomatz (May 2022 – present)
- Teng-Jui Lin (January 2024 – present)
- Kylee Hillman (May 2024 - present)
- Alfonso Restrepo (May 2025 – present)

- **Former**

- Elizabeth Voke (December 2020 – December 2025)
- Francis Ledesma (December 2019 – May 2024)
- Joshua Hubbard (December 2019 – May 2024)
- Madeline Klinger (August 2019 – May 2024)\* Co-advised with Linda Wilbrecht
- Alison Lui (December 2018 – December 2023)\* Co-advised with Kranthi Mandadapu
- Nicole Navarro (August 2019 – December 2023)
- Nicholas Ouassil (December 2018 – November 2023)
- Jeffrey Wang (December 2018 – August 2023)
- Gabriel Dorhliac (December 2016 – December 2022)\* Co-advised with Aaron Streets  
Current affiliation: Research Associate, SLAC National Accelerator Laboratory
- Sarah Yang (December 2017 – August 2022)\* Co-advised with David Schaffer  
Current affiliation: MIT Postdoctoral fellow, [Ed Boyden Lab](#)
- Chris Jackson (August 2019 – June 2022)  
Current affiliation : [AAAS Science and Technology Policy Fellow](#)
- Francis Cunningham (December 2017 – June 2022)  
Current affiliation : Scientist at [Berkeley Yeast](#)
- Natalie Goh (December 2017 – May 2022)  
Current affiliation : Scientist at [Scribe Therapeutics](#)
- Rebecca Pinals (December 2016 – May 2021)  
Current affiliation : [Assistant Professor, Stanford University Chemical Engineering](#)
- Darwin Yang (January 2016 – October 2020)  
Current affiliation : Scientist, [Evolve Biotech](#)
- Gozde Demirer (January 2016 – June 2020)  
Current affiliation: [Assistant Professor, Caltech Department of Chemical Engineering](#)
- Abraham Beyene (January 2016 – December 2019)  
Current affiliation: Principal Investigator of the [Beyene Lab at the HHMI Janelia Research Campus](#).
- Linda Chio (January 2016 – April 2020)  
Current affiliation: Research scientist at [Gordian Biotechnology](#).

### (3) UNDERGRADUATE STUDENTS

- **Current**

- Aarushi Mupparti
- Allie Jiang
- Ava Moudi
- Chelsey (Gaeun) Lee
- Christian Rosario
- Kate Verhagen
- Laura Kim
- Lillian Hiraoka
- Natalie Oh
- Siri Tantry
- Siyue Yang
- Syed Usman Kashif
- Sonya Mengel
- William Nader
- Zirun Liang

- **Former**

- Abhishek Jindal Aditham – Ph.D. student in Bioengineering at MIT
- Aishy Murali – Process Scientist, Boehringer Ingelheim
- Alexia Li – Graduate Student, Columbia Chemical Engineering

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- Amad Jalil -
- Amanda Shiu -
- Ami Thakrar – Ph.D. student in Biomedical Engineering at Harvard
- Ankita Biyani- Berkeley Student
- Andrew Lee -
- Andrew Puglise – PhD Student and the University of Michigan
- Arismel Tena Meza- Ph. D. Student in Organic Chemistry at UCLA
- Armine Dingilian – Ph.D. student in Biophysics at UIUC
- Ashvin Irrinki- Clinical Operations Intern at Boomerang Medical
- Autumn Lee – Graduate student at Columbia University
- Ava Moudi- PhD Student in Molecular Biology at Princeton
- Billie Zeng
- Bora Ozcan – Research Specialist at Scribe Therapeutics
- Carl Atik - Manufacturing Engineer 2 @ Penumbra
- Cerise Wong- PhD Student in Chemical Engineering, Columbia University
- Chantel Mabubay Martino- Bioprocess Operations @ Genentech
- Christopher Acosta- UC Berkeley Laboratory Manager, Kumar/Streets Labs
- Cindy Zhou – Ph.D. student in Chemical Engineering at MIT
- Danya Hassan- M.S. Student in Human Genetics and Genomic Data Analytics
- Deverin Smith - Research Associate @ Aviva Systems Biology
- Diane Kim
- Dorothy Li – Clinical Lab Associate at Lucence
- Edward Lien
- Edward Sun
- Eric Liu
- Eric Tindall
- Esther Leem
- Evan Vail
- Feiyang Chen-
- Francesca Giordani – Medical Student
- Ghida El Bsat
- Hanni Yu
- Jamie Lynn Phan- Berkeley Student, Optometry Assistant
- Jason Morales
- Joseph Adar
- Justin Brewer- PhD Student in Chemical and Biomolecular Engineer at University of Delaware
- Justin Gardner
- Kaushik Seshadri
- Kayleigh Fort
- Kenneth Celis
- Kyle De Mathias – Graduate Student at Stanford
- Kyle Shun
- Lee Puckett
- Marcus Varni
- Mariana Vaca
- Matthew Pham
- Megan Teresa Tandean
- Michael Ni
- Miles Duong
- Minjae Kim- Chemical Analyst at the Republic of Korea CBRN Defense Command
- Natasha Raut
- Navid Boozarpour – Process Associate, Clara Foods
- Nicole Carl- External Quality at Genentech
- Nicole Sugino
- Nikitha Sridhar
- Octavio Arias-Soto
- Padma Muppurala

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- Rachel (Jiaxuan) Zhao- Research Staff at Columbia University
- Rigney Miller
- Roger Chang – Ph.D student in Chemical Engineering at UIUC
- Salwan Butrus – Ph.D student in Chemical Engineering at UC Berkeley
- Sejal Krishnan
- Siddharth Mohapatra
- Siri Tantry
- Siyue Yang- Graduate Student at Scripps Research
- Soungyun (Lucio)Yang
- Tanya Chaudhary – R&D Engineer at Apple, Biomedical Division
- Thalia Georgiou – Graduate Student at UCLA Biophysics
- Tiffany Unsulangi – Medical School at UCSF
- Tina Ye – Ph.D student in Chemical Engineering at Rice University
- Tong Ly
- Xavier Valez
- Xiaoqi Sun – Graduate Student, MIT Chemical Engineering

### (4) HIGH SCHOOL STUDENT MENTEES

#### Current

- Alzbeta Markov
- Wesley Wu
- Dylan Golmb
- Akhil Sanapala Venkata
- Cindy Donguyen

#### Former

- Kelsey Nguyen
- Julius Kim
- Malia Nishida
- Aditi Lyer
- Kaiyan Liu
- Arvin Deshmukh
- Josh Kim
- Joshua Zhang
- Julia Zhao
- Lauren Vidinha
- Madeline Haubert
- Nawal Altoukhi
- Nicholas Ellis
- Prisha Rai
- Riya Jwalanna
- Damlanur Oztem
- Aaron Chirsa
- Maria Rutkowska
- Rachel Lou (see [Prof. Landry high school research mentee highlight in Nature Nanotechnology](#))
- Sarah Manoj
- Siddarth Mane
- Rachel Wang
- Jessica Zhang

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### LEADERSHIP AND SERVICE

- **Journal editor**  
2022 - PNAS guest editor
- **Grant review panelist**  
2022 - NIH NANO Grant review study section, October Panel (standing member)  
2022 - NIH NANO Grant review study section, June Panel (standing member)

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2022 - DOE Plant Biosystems Design Review, May panel (ad hoc)  
2022 - NIH NANO Grant review study section, February Panel (standing member)  
2021 - NSF Enabling Discovery through Genomics (EDGE) program (ad hoc)  
2021 - NIH NANO Grant review study section, October Panel (standing member)  
2021 - NIH NANO Grant review study section, June Panel (standing member)  
2021 - NSF Phase I: Energy Storage and Other Technologies Panel (ad hoc)  
2021 - NIH NANO Grant review study section, February Panel (standing member)  
2020 - NSF Plant Genome Research Program (ad hoc)  
2020 - NIH NANO Grant review study section, October Panel (standing member)  
2020 - Phase I: Distributed Ledger & Other Innovative Technologies SBIR/STTR Phase I review panel  
2020 - NIH NANO Grant review study section, February Panel (standing member)  
2020 - USDA National Institute of Food and Agriculture panel on Nanotechnology for Agricultural and Food Systems  
2020 - Phase I: COVID solutions and other Innovative Technologies II  
2020 - SBIR Phase I: Assured - Securely sharing COVID19 information grant review  
2019 - SBIR Technology Transfer grant review (R43/R44) (ad hoc)  
2018 - NIH CMT grant review study section (ad hoc)  
2018 - NSF SBIR/STTR grant review panelist (ad hoc)  
2017 - NSF SBIR/STTR grant review panelist (ad hoc)  
2016 - NSF CBET grant reviewer (ad hoc)  
2016 - NIH BPNS grant review study section (ad hoc)

- **Proposal Committee for the formation of a Department of Neuroscience (2021 – 2023)**  
Committee charged with the design and creation of a neuroscience department for the UC Berkeley Campus.
- **Diversity Equity and Inclusion Chair (2019, 2022) Member (2019 – present)**  
DE&I representative and chair for the department of chemical and biomolecular engineering.
- **Robotics & Engineering for Youth: Faculty Advisor (2017 - present)**  
Mentor for student group to expose K-8 students to engineering and computer science via hands-on lego league robotics and scratch programming.
- **Alliance for Diversity in Science and Engineering (ADSE): Faculty Advisor (2017 - present)**  
Mentor and faculty advisor for ADSE, attended inaugural meeting, contribute to outreach and professional development events.
- **Alpha Chi Sigma Chemistry Fraternity: Faculty Mentor (2016 - present)**  
Mentor for Alpha Chi Sigma, Sigma chapter. Serve as student mentor, speaker, and outreach.
- **Instructor, Cambridge Centre for International Research (2022 – present)**  
Instructor and mentor for over 20 high school students in small group or one-on-one settings. Highlighted as a top teacher and top instructor on Zou *et al.* [The potential for Academics to Inspire the Next Generation. Nature Nanotechnology \(2024\)](#)
- **Latino/a Association of Graduate Students in Engineering and Sciences at UC Berkeley (LAGSES): Faculty Mentor (2016 - 2019)**  
Mentor for LAGSES students, speaker, panelist, and student-faculty liaison.
- **MIT Presidential Committee on Race and Diversity: Campus-wide elected postdoctoral representative (2013 - 2016)**  
Representative for the postdoctoral body. Led efforts with MIT president Rafael Rief to encourage recruitment, retention, and promotion of underrepresented students, faculty, and staff on the MIT campus.
- **Society for the Advancement of Chicanos and Native Americans in Science (SACNAS): Founder, MIT (2013 - 2016) President, University of Illinois (2010, 2011, 2012, Member 2008 – 2012)**  
Founded the first SACNAS chapter at MIT. Started a professional SACNAS chapter on campus.
- **MIT Postdoctoral Association: Diversity and Inclusion Chair (2013 - 2016)**  
Serve as a representative and liaison for MIT minority postdocs. Lead negotiation efforts for postdoctoral wages and benefits. Organize career development events for minority postdocs.