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Head, Cancer Nanomedicine Laboratory
Co-Director, The Pat and Ian Cook Doctoral Program in Cancer Engineering
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EDUCATIONAL BACKGROUND

Postdoctoral Fellow in Biomedical Engineering, Massachusetts Institute of Technology Advisor: Robert Langer	(2010-2012)
Ph.D. in Chemistry, University of Illinois at Urbana-Champaign Advisor: Michael S. Strano; Thesis link: http://hdl.handle.net/2142/16052	(2010)
B.A. in History Rice University, Houston, Texas	(2000)

PROFESSIONAL POSITIONS & EMPLOYMENT

<i>Co-Director</i> , The Pat and Ian Cook Doctoral Program in Cancer Engineering Memorial Sloan Kettering Cancer Center, New York, New York	(8/2023-present)
<i>Member</i> , Molecular Pharmacology Program, Memorial Sloan Kettering Cancer Center, New York, New York	(10/2022-present)
<i>Professor</i> , Physiology, Biophysics & Systems Biology Graduate Program, Weill Cornell Medicine, Cornell University, New York, New York	(10/2022-present)
<i>Professor</i> , Department of Pharmacology, Weill Cornell Medicine, Cornell University, New York, New York	(10/2022-present)
<i>Graduate Field Faculty</i> , Meinig School of Biomedical Engineering, Cornell University	(2/2021-present)
<i>Bristol-Myers Squibb/James D. Robinson III Junior Faculty Chair</i> , Memorial Sloan-Kettering Cancer Center, New York, New York	(9/2018-12/2022)
<i>Associate Member</i> , Molecular Pharmacology Program, Memorial Sloan Kettering Cancer Center, New York, New York	(7/2018-10/2022)
<i>Associate Professor</i> , Physiology, Biophysics & Systems Biology Graduate Program, Weill Cornell Medicine, Cornell University, New York, New York	(7/2018-10/2022)
<i>Associate Professor</i> , Department of Pharmacology, Weill Cornell Medicine, Cornell University, New York, New York	(7/2018-10/2022)
<i>Assistant Professor</i> , Physiology, Biophysics, & Systems Biology Graduate Program, Weill Cornell Medicine, Cornell University, New York, New York	(8/2012-7/2018)
<i>Assistant Professor</i> , Department of Pharmacology, Weill Cornell Medicine, Cornell University, New York, New York	(8/2012-7/2018)
<i>Faculty Member</i> , Center for Molecular Imaging & Nanotechnology, Memorial Sloan Kettering Cancer Center, New York, New York	(6/2012-present)
<i>Assistant Member</i> , Molecular Pharmacology Program, Memorial Sloan Kettering Cancer Center, New York, New York	(6/2012-7/2018)
<i>Damon Runyon Fellow</i> , Koch Institute for Integrative Cancer Research, Robert Langer Group, Massachusetts Institute of Technology, Boston, Massachusetts	(7/2010-5/2012)
<i>Postdoctoral Research Associate</i> , Koch Institute for Integrative Cancer Research, Robert Langer Group, Massachusetts Institute of Technology, Boston, Massachusetts	(2/2010-6/2010)
<i>Researcher</i> , Visigen Biotechnologies, Houston, Texas	(9/2002-6/2003)
<i>Visiting Scientist</i> , Rice Quantum Institute, Robert Curl Group, Rice University, Houston, Texas	(5/2002-6/2003)
<i>Visiting Scientist</i> , Department of Chemistry, T. Randall Lee Group,	(4/2002-6/2003)

University of Houston, Houston, Texas

Science Teacher, 7th and 8th grades, The Kinkaid School, Houston, Texas

(8/2000-5/2002)

HONORS AND AWARDS

Gray Foundation Team Science Awardee	(2026)
College of Liberal Arts and Sciences Young Alumni Award, University of Illinois	(2024)
Life Sciences Invention of the Year, UM Ventures	(2022)
American Institute for Medical and Biological Engineering (AIMBE) Fellow	(2021)
Pharmacology Teaching and Mentoring Award, Weill Cornell Graduate School	(2020)
CRS Nanomedicine and Nanoscale Drug Delivery Focus Group Junior Faculty Award	(2018)
American Cancer Society Research Scholar	(2018)
Bristol-Myers Squibb/James D. Robinson III Junior Faculty Chair	(2018)
CAREER Award, National Science Foundation	(2018)
Cycle for Survival Equinox Innovation Award in Rare Cancers	(2017)
Pershing Square Sohn Prize, Pershing Square Sohn Cancer Research Alliance	(2017)
Kavli Fellow, National Academy of Sciences	(2015)
NIH Director's New Innovator Award	(2012)
Louis V. Gerstner Jr. Young Investigator Award	(2012)
Frank A. Howard Scholar, Memorial Sloan-Kettering Cancer Center	(2012)
Damon Runyon Cancer Research Foundation Postdoctoral Fellowship	(2010)
Materials Research Society Graduate Student Silver Award	(2009)
Walter Brown Fellowship, Department of Chemistry, University of Illinois	(2006)
Beckman Institute Graduate Fellowship, University of Illinois	(2006)
Collaboration Success Award, Council of Chemical Research	(2006)
NSF/IIE CESRI Fellowship	(2006)
Roger Adams Fellowship, Department of Chemistry, University of Illinois	(2003)

PUBLICATIONS * Corresponding Author

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Published and In Press – Peer-Reviewed

- (118) C Hinterleitner, VJA Barthelet, HV Goldberg, KC Vogt, AM Perea, LR Hillger, S Ruiz, D McHugh, Y-J Ho, A Chaves-Perez, M Skamagki, S Flowers, HC Styers, N Rekhtman, X Zhuang, G Barretto, X Li, JT Watson, W Luan, J Simon, T Tammela, R Gardner, CM Rudin, PB Romesser, MJ Bott, A Filliol*, **DA Heller***, SW Lowe*. "Senescence-directed nanotherapy ameliorates fibrosis and overcomes immune exclusion in cancer." *Science* (2026) In press.
- (117) M Panagiotakopoulou, A Goren, D Reker, A Schroeder, C Allen*, **DA Heller***. "Artificial intelligence in the design and application of nanoparticle drug delivery systems." *Nature Reviews Bioengineering* (2026) In press.
- (116) SS Piletsky, EE Keblish, AR Goffin, X Jin, I-J Hwang, A Amb, D Kilin, S Kilina, M Zheng, M Kim, **DA Heller***. Handle-free conjugation of small molecules generates tunable emissive defects on carbon nanotubes." *Nature Synthesis* 5 (2026) 1385-1393.
- (115) D Goerzen, M Pasquali, M Kim, **DA Heller***. "Industrial Adoption of Carbon Nanotubes." *Nano Letters* 26 (2026) 4004-4013.
- (114) J Das, SK Hombalkar, AD Klein, E Nsasra, M Vasandani, K Petrucci, D Lu, S Ruiz, O Kliper-Gross, J Hu, M Riegman, X Jiang, **DA Heller**, A Zaritsky, MS Bradbury, M Overholtzer*. "Ferroptosis induces heterogeneous death profiles that are controlled by lysosome rupture." *Developmental Cell* 61 (2026) 760-772.
- (113) D Goerzen, M Kim, C Schroff, MN Hoang, JS Wollowitz, A Kolb, JP Walshon, K McCortney, C Horbinski, K Galbraith, S Raoof, M Snuderl, A Ordureau, **DA Heller***. "Machine perception liquid biopsy identifies brain tumors via systemic immune and tumor microenvironment signature." *Nature Nanotechnology* 21 (2026) 277-287.
- (112) K Vogt, M Panagiotakopoulou, MT Manzari Honu, X Hu, X Yu, R Raziuddin, Q LaPlant, S Ruiz, GP Raju, J Jin, DA Scheinberg, **DA Heller***. "Tumor microenvironment-targeted PROTAC nanoparticle self-assembly broadly predicted by structural descriptors." *Science Advances* 11 (2025) eadu2292.

- (111) C Chen, AM Perea del Angel, R Sridharan, **DA Heller***. "Endolysosomal Sequestration Effects Controlled Release of BRAF Paradox Breaker Nanoparticles." *ACS Nano* 19 (2025) 33879-33890.
- (110) L Nogueira*, R Alvim, H Baker, K Nagar, J Thomas, L Alvim, K Kim, **DA Heller**, A Reis, A Scherz, J Coleman*. "Synergistic Efficacy of WST11-VTP and P-Selectin-Targeted Nanotherapy in a Preclinical Prostate Cancer Model." *Cancers* 17 (2025) 2361.
- (109) SB Ruiz, DE Tylawsky, J Shah, M Saoi, B Cuevas, S Desai, B Racz, AM Perea, AR Izawa-Ishiguro, J Cross, **DA Heller***. "Phospholipase PAFAH2 Mediates Ferroptosis Surveillance and Lipid Remodeling to Promote Resistance in KEAP1 Mutant Cancers." *ACS Chemical Biology* 20 (2025) 1739-1755.
- (108) SS Piletsky, EE Keblish, **DA Heller***. "Controlled quantum well formation on DNA-wrapped carbon nanotubes via peroxide-mediated aryl diazonium reduction." *Nano Letters* 25 (2025) 2480–2485.
- (107) N Berisha, A Farahpour, M Ramakrishnan, C Chen, SA McPhee, T Wang, T-D Li, K Hema, M Panagiotakopoulou, V Athiyarath, M Coste, Y Marciano, E Sherman, RV Ulijn*, **DA Heller***. "Directed discovery of high-loading nanoaggregates enabled by drug-matched oligo-peptide excipients." *Chem* (2025) 102404.
- (106) KC Vogt, PC Silberman, Q Lin, JE Han, A Laflin, HA Gellineau, **DA Heller**, DA Scheinberg*. "Microenvironment actuated CAR T cells improve solid tumor efficacy without toxicity." *Science Advances* 11 (2025) eads3403.
- (105) BE McLarney, AY Sonay, E Apfelbaum, N Mostafa, S Monette, D Goerzen, N Aguirre, RM. Exner, C Habjan, E Isaac, NB Phung, M Skubal, M Kim, A Ogirala, D Veach, **DA Heller**, J Grimm*. "A pan-cancer dye for solid-tumour screening, resection and wound monitoring via short-wave and near-infrared fluorescence imaging." *Nature Biomedical Engineering* 8 (2024) 1092–1108.
- (104) S Yamaguchi, R Sedaka, C Kapadia, J Huang, J-S Hsu, TF Berryhill, L Wilson, S Barnes, C Lovelady, Y Oduk, RM Williams, EA Jaimes, **DA Heller**, T Saigusa*. "Rapamycin-Encapsulated Nanoparticle Delivery in Polycystic Kidney Disease Mice." *Scientific Reports* 14 (2024) 15140.
- (103) KR Keshari*, **DA Heller***, R Boltyanskiy, H Hricak, T Magaldi, M Overholtzer*. "Engineering focusing on cancer." *Cancer Cell* 42 (2024) 1138-1141.
- (102) M Kim, JJ McCann, J Fortner, E Randall, C Chen, Y Chen, Z Yaari, Y Wang, RL Koder, **DA Heller***. "Quantum defect sensitization via phase-changing supercharged antibody fragments." *Journal of the American Chemical Society* 146 (2024) 12454-12462.
- (101) TY Sia, Z Yaari, R Feiner, E Smith, A Da Cruz Paula, P Selenica, S Doddi, DS Chi, NR Abu-Rustum, DA Levine, B Weigelt, M Fleisher, LV Ramanathan, **DA Heller**, K Long Roche*. "Uterine washings as a novel method for early detection of ovarian cancer: Trials and tribulations." *Gynecologic Oncology Reports* 51 (2024) 101330.
- (100) M Kim, D Goerzen, PV Jena, JE Zeng, M Pasquali, RA Meidl, **DA Heller***. "Human and Environmental Safety of Carbon Nanotubes Across their Life Cycle." *Nature Reviews Materials* 9 (2024) 63-81.
- (99) C Chen, Y Wu, S-T Wang, N Berisha, MT Manzari, K Vogt, O Gang, **DA Heller***. "Fragment-Based Drug Nanoaggregation Reveals Drivers of Self-Assembly." *Nature Communications* 14 (2023) 8340.
- (98) M Antman-Passig, Z Yaari, D Goerzen, R Parikh, S Chatman, LE Komer, C Chen, E Grabarnik, M Mathieu, A Haimovitz-Friedman, **DA Heller***. "Nanoreporter identifies lysosomal storage disease lipid accumulation intracranially." *Nano Letters* 23 (2023) 10687-10695.
- (97) BE McLarney, M Kim, S Roberts, M Skubal, H-T Hsu, A Ogirala, E Pratt, N Pillarsetty, **DA Heller**, JS Lewis, J Grimm*. "Ambient Light-Resistant Shortwave Infrared Fluorescence Imaging for Preclinical Tumor Delineation via pH Low-Insertion Peptide Conjugated to Indocyanine Green." *Journal of Nuclear Medicine* 64 (2023) 1647-1653.
- (96) J Islam, P Conroy, C Fercher, M Kim, Z Yaari, M Jones, TDM Bell, T Caradoc-Davies, R Law, J Whisstock, **D Heller**, S Mahler, S Corrie*. "Design of Polarity-Dependent Immunosensors Based on the Structural Analysis of Engineered Antibodies." *ACS Chemical Biology* 18 (2023) 1863-1871.
- (95) M Kim, M Panagiotakopoulou, C Chen, S Ruiz, K Ganesh, T Tammela, **DA Heller***. "Micro-Engineering and Nano- Engineering Approaches to Investigate Tumour Ecosystems." *Nature Reviews Cancer* 23 (2023) 581-599.
- (94) M Kim, C Chen, ZA Yaari, R Frederiksen, E Randall, J Wollowitz, C Cupo, X Wu, J Shah, DW. Worroll, RE Langenbacher, D Goerzen, Y-M Li, H An, Y Wang, **DA Heller***. "Nanosensor-Based Monitoring of Autophagy-Associated Lysosomal Acidification In Vivo." *Nature Chemical Biology* (2023). <https://doi.org/10.1038/s41589-023-01364-9>

- (93) RE Langenbacher, CP Horoszko, M Kim, **DA Heller***. "Hematoxylin Nuclear Stain Reports Oxidative Stress Via Near-Infrared Emission." *ACS Chemical Biology* 19 (2023) 1237-1245. PMID: PMC10289833
- (92) D Tylawsky, H Kiguchi, J Vaynshteyn, J Gerwin, J Shah, T Islam, M Snuderl, M Greenblatt, D Boué, Y Shamay, P Raju*, **DA Heller***. "P-selectin-targeted nanocarriers induce active crossing of the blood-brain barrier via caveolin-1-dependent transcytosis." *Nature Materials* 22 (2023) 391-399.
- (91) JM Kubala, KB Laursen, R Schreiner, RM Williams, JC van der Mij, MJ Crowley, NP Mongan, DM Nanus, **DA Heller**, LJ Gudas*. "NDUFA4L2 reduces mitochondrial function resulting in defective lysosomal trafficking in clear cell renal cell carcinoma." *Cancer Biology & Therapy* 24 (2022) 2170669.
- (90) R Feiner, E Jones, M Antman-Passig, T Irie, N Berisha, H Oved, D Khan, L Witek, RM White, **DA Heller***. "Drug-Eluting Rubber Bands for Tissue Ligation." *ACS Applied Materials & Interfaces* 14 (2022) 27675-27685.
- (89) M Antman-Passig, E Wong, GR Frost, C Cupo, J Shah, A Agustinus, Z Chen, C Mancinelli, M Kamel, T Li, LA Jonas, Y-M Li, **DA Heller***. "Optical Nanosensor for Intracellular and Intracranial Detection of Amyloid-beta." *ACS Nano* 16 (2022) 7269-7283.
- (88) LN Benson, Y Liu, X Wang, Y Xiong, SW Rhee, Y Guo, KS Deck, CJ Mora, L-X Li, L Huang, JT Andrews, Z Qin, RS Hoover, B Ko, RM Williams, **DA Heller**, EA Jaimes, S Mu*. "The IFN γ -PDL1 Pathway Enhances CD8T-DCT Interaction to Promote Hypertension" *Circulation Research* 130 (2022) 1550-1564.
- (87) M Kim, C Chen, P Wang, JJ Mulvey, Y Yang, C Wun, M Antman-Passig, H-B Luo, S Cho, K Long-Roche, LV Ramanathan, A Jagota, M Zheng, Y Wang, **DA Heller***. "Detection of ovarian cancer via the spectral fingerprinting of quantum-defect-modified carbon nanotubes in serum by machine learning." *Nature Biomedical Engineering* 6 (2022) 267-275.
- (86) C Chen, Z Yaari, E Apfelbaum, P Grodzinski, Y Shamay, **DA Heller***. "Merging Data Curation and Machine Learning to Improve Nanomedicines." *Advanced Drug Delivery Reviews* (2022) 114172.
- (85) PV Jena, M Gravely, CC Cupo, MM Safaee, D Roxbury*, **DA Heller***. "Hyperspectral Counting of Multiplexed Nanoparticle Emitters in Single Cells and Organelles." *ACS Nano* 16 (2022) 3092-3104.
- (84) X Guo, L Xu, H Velazquez, T-M Chen, R Williams, **D Heller**, B Burtness, R Safirstein, G Desir*. Kidney-Targeted Renalase Agonist Prevents Cisplatin-Induced Chronic Kidney Disease by Inhibiting Regulated Necrosis and Inflammation. *Journal of the American Society of Nephrology* 33 (2022) 342-356.
- (83) RM Williams, J Shah, E Mercer, HS Tian, V Thompson, JM Cheung, M Dorso, JM Kubala, LJ Gudas, E de Stanchina, EA Jaimes*, **DA Heller***. "Kidney-Targeted Redox Scavenger Therapy Prevents Cisplatin-Induced Acute Kidney Injury." *Frontiers in Pharmacology* 12 (2021).
- (82) Z Yaari, Y Yang, E Apfelbaum, C Cupo, A Settle, Q Cullen, W Cai, K Long Roche, DA Levine, M Fleisher, L Ramanathan, M Zheng, A Jagota, **DA Heller***. "A Perception-Based Machine-Perception Nanosensor Platform to Detect Cancer Biomarkers." *Science Advances* 7 (2021) eabj0852.
- (81) CP Horoszko, PJ Schnatz, J Budhathoki-Uprety, RV Rao-Pothuraju, RL Koder, **DA Heller***. "Non-Covalent Coatings on Carbon Nanotubes Mediate Photosensitizer Interactions." *ACS Applied Materials & Interfaces* 13 (2021) 51343–51350.
- (80) R Langenbacher, J Budhathoki-Uprety, PV Jena, D Roxbury, J Streit, M Zheng, **DA Heller***. "Single-Chirality Near-Infrared Carbon Nanotube Sub-Cellular Imaging and FRET Probes." *Nano Letters* 21 (2021) 6441-6448.
- (79) B Podlesny, B Olszewska, Z Yaari, PV Jena, G Ghahramani, R Feiner, **DA Heller***, D Janas*. "En route to single-step, two-phase purification of carbon nanotubes facilitated by high-throughput spectroscopy." *Scientific Reports* 11 (2021) 10618.
- (78) MT Manzari, Y Shamay, H Kiguchi, M Scaltriti, N Rosen, **DA Heller***. "Targeted Drug Delivery Strategies for Precision Medicines" *Nature Reviews Materials* 6 (2021) 351–370.
- (77) RM Williams, S Chen, RE Langenbacher, TV Galassi, JD Harvey, PV Jena, J Budhathoki-Uprety*, M Luo*, **DA Heller***. "Harnessing Nanotechnology to Expand the Toolbox of Chemical Biology" *Nature Chemical Biology* 17 (2021) 129-137.
- (76) Z Yaari, JM Cheung, HA Baker, RS Frederiksen, PV Jena, F Jiao, S Scheuring, M Luo, **DA Heller***. "Nanoreporter of an Enzymatic Suicide Inactivation Pathway" *Nano Letters* 20 (2020) 7819-7829.
- (75) NB Tannan, MT Manzari, LM Herviou, M Da Silva Ferreira, C Hagen, H Kiguchi, Z Asgari, K Manova-Todorova, V Seshan, E de Stanchina, **DA Heller**, A Younes*. "Dual Inhibition of MCL1 and BCL2 in Lymphoma Using Tumor Targeted Nanoparticles for Drug Delivery" *Blood* (2020) blood.2020008017.
- (74) RM Williams, JD Harvey, J Budhathoki-Uprety, **DA Heller***. "A Glutathione-S-transferase Fusion Protein Nanosensor." *Nano Letters* 20 (2020) 7287–7295.

- (73) SJ Han, RM Williams, M Kim, **DA Heller**, V D'Agati, M Schmidt-Supprian, and HT Lee*. "Renal proximal tubular NEMO plays a critical role in ischemic acute kidney injury" *JCI Insight* 5 (2020) e139246.
- (72) TV Galassi, M Antman-Passig, Z Yaari, J Jessurun, RE Schwartz, **DA Heller***. "Long-Term In Vivo Biocompatibility of Single-Walled Carbon Nanotubes." *PLoS One* 15 (2020) e0226791.
- (71) M Ruscetti, JP Morris, R Mezzadra, J Russell, J Leibold, PB Romesser, J Simon, A Kulick, Y-j Ho, M Fennell, J Li, RJ Norgard, JE Wilkinson, D Alonso-Curbelo, R Sridharan, **DA Heller**, E de Stanchina, BZ Stanger, CJ Sherr, SW Lowe*. "Senescence-Induced Vascular Remodeling Creates Therapeutic Vulnerabilities in Pancreas Cancer." *Cell* 181 (2020) 424-441.
- (70) SJ Han, RM Williams, V D'Agati, EA Jaimes, **DA Heller**, HT Lee*. "Selective Nanoparticle-Mediated Targeting of Renal Tubular Toll-Like Receptor 9 Attenuates Ischemic Acute Kidney Injury." *Kidney International* 98 (2020) 76-87.
- (69) CP Horoszko, PV Jena, D Roxbury, SV. Rotkin, **DA Heller***. "Optical Voltammetry of Polymer-Encapsulated Single-Walled Carbon Nanotubes." *Journal of Physical Chemistry C* 123 (2019) 24200-24208.
- (68) MA Lee, CM Duarte, VM Eguiluz, **DA Heller**, R Langer, MG Meekan, HD Sikes, M Srivastava, MS Strano*, RP Wilson. "Can Fish and Cell Phones Teach Us About Our Health?" *ACS Sensors* 4 (2019) 2566-2570.
- (67) J Budhathoki-Uprety, J Shah, JA Korsen, AE Wayne, TV Galassi, JR Cohen, JD Harvey, PV Jena, LV Ramanathan, EA Jaimes, **DA Heller***. "Synthetic Molecular Recognition Nanosensor Paint for Microalbuminuria." *Nature Communications* 10 (2019) 3605.
- (66) H Kodama, Y Shamay, Y Kimura, J Shah, SB Solomon, **D Heller**, G Srimathveeravalli*. "Electroporation-induced changes in tumor vasculature and microenvironment can promote the delivery and increase the efficacy of sorafenib nanoparticles." *Bioelectrochemistry* 130 (2019) 107328.
- (65) JD Harvey, RM Williams, KM. Tully, HA Baker, Y Shamay, **DA Heller***. "An in Vivo Nanosensor Measures Compartmental Doxorubicin Exposure." *Nano Letters* 19 (2019) 4343-4354.
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- (63) TV Galassi, PV Jena, J Shah, G Ao, E Molitor, Y Bram, A Frankel, J Park, J Jessurun, DS Ory, A Haimovitz-Friedman, D Roxbury, J Mittal, M Zheng, R E Schwartz, **DA Heller***. "An Optical Nanoreporter of Endolysosomal Lipid Accumulation Reveals Enduring Effects of Diet on Hepatic Macrophages In Vivo." *Science Translational Medicine* 10 (2018) eaar2680.
- (62) RM Williams, C Lee, **DA Heller***. "A Fluorescent Carbon Nanotube Sensor Detects the Metastatic Prostate Cancer Biomarker uPA." *ACS Sensors* 3 (2018) 1838-1845.
- (61) JD Harvey, GH Zerze, KM Tully, J Mittal, **DA Heller***. "Electrostatic Screening Modulates Analyte Binding and Emission of Carbon Nanotubes." *Journal of Physical Chemistry C* 19 (2018) 10592-10599.
- (60) RM Williams, C Lee, TV Galassi, JD Harvey, R Leicher, M Sirenko, M Dorso, J Shah, N Olvera, F Dao, DA Levine, **DA Heller***. "Non-Invasive Ovarian Cancer Biomarker Detection via an Optical Nanosensor Implant." *Science Advances* 4 (2018) eaaq1090.
- (59) Y Shamay, J Shah, DF Tschaharganeh, D Roxbury, J Budhathoki-Uprety, M Işık, A Mizrahi, K Nawaly, JL Sugarman, E Baut, MR Neiman, DC Johnson, R Sridharan, KL Chu, VK Rajasekhar, JD Chodera, SW Lowe, **DA Heller***, "Quantitative Self-Assembly Prediction Yields Targeted Nanomedicines" *Nature Materials* 17 (2018) 361-368.
- (58) RM Williams, J Shah, HS Tian, Xi Chen, F Geissman, EA Jaimes, **DA Heller***, "Selective Nanoparticle Targeting of the Renal Tubules." *Hypertension* 71 (2018) 87-94. [Highlighted in *Hypertension Perspective*, Yap, et. al., 2018]
- (57) JD Harvey, HA. Baker, E Mercer, J Budhathoki-Uprety, **DA Heller***, "Control of carbon nanotube solvatochromic response to chemotherapeutic agents." *ACS Applied Materials & Interfaces* 9 (2017) 37947-37953.
- (56) CM Sims*, SK Hanna, **DA Heller**, CP Horoszko, ME Johnson, AR Montoro Bustos, V Reipa, KR Riley, BC Nelson*, "Redox-Active Nanomaterials for Nanomedicine Applications." *Nanoscale* 9 (2017) 15226-15251.
- (55) PV Jena, D Roxbury, TV Galassi, L Akkari, CP Horoszko, DB laea, J Budhathoki-Uprety, NH Pipalia, AS. Haka, JD Harvey, J Mittal, FR Maxfield, JA Joyce, **DA Heller***: "A Carbon Nanotube Optical Reporter Maps Endolysosomal Lipid Flux." *ACS Nano* 11 (2017) 3875-3882. [Highlighted in *ACS Nano Perspective*, Farrera, et.al., 2017]
- (54) J Budhathoki-Uprety, JD Harvey, E Isaac, RM Williams, TV Galassi, RE Langenbacher, **DA Heller***: "Polymer Cloaking Modulates the Carbon Nanotube Protein Corona and Delivery into Cancer Cells." *Journal of Materials Chemistry B* 5 (2017) 6637-6644.

- (53) PV Jena, MM Safaee, **DA Heller**, D Roxbury*: "DNA-Carbon Nanotube Complexation Affinity and Photoluminescence Modulation are Independent." *ACS Applied Materials & Interfaces* 9 (2017) 21397-21405.
- (52) J Budhathoki-Uprety, RE Langenbacher, PV Jena, D Roxbury, **DA Heller***: "A Carbon Nanotube Optical Sensor Reports Nuclear Entry via a Noncanonical Pathway." *ACS Nano* 11 (2017) 3875-3882.
- (51) JD Harvey, PV Jena, HA Baker, GH Zerze, RM Williams, TV Galassi, D Roxbury, J Mittal, **DA Heller***: "A Carbon Nanotube Reporter of miRNA Hybridization Events In Vivo." *Nature Biomedical Engineering* 1 (2017) 0041.
- (50) A Mizrahi, Y Shamay, J Shah, S Brook, J Soong, V Rajasekhar, J Humm, J Healey, S Powell, J Baselga, **DA Heller***, A Haimovitz-Friedman*, M Scaltriti*: "Tumor-specific PI3K inhibition via nanoparticle delivery in head and neck squamous cell carcinoma." *Nature Communications* 8 (2017) 14292.
- (49) DA Scheinberg*, J Grimm, **DA Heller**, EP Stater, M Bradbury, MR McDevitt: "Advances in the clinical translation of nanotechnology." *Current Opinion in Biotechnology* 46 (2017) 66-73.
- (48) PV Jena, TV Galassi, D Roxbury, **DA Heller***: "Review—Progress toward Applications of Carbon Nanotube Photoluminescence." *ECS Journal of Solid State Science and Technology* 6 (2017) M3075-M3077.
- (47) TV Galassi, PV Jena, D Roxbury, **DA Heller***: "Single nanotube spectral imaging to determine molar concentrations of isolated carbon nanotube species." *Analytical Chemistry* 89 (2017) 1073-1077.
- (46) Y Shamay, M Elkabets, H Li, J Shah, S Brook, F Wang, K Adler, E Baut, M Scaltriti, PV Jena, EE Gardner, JT Poirier, CM Rudin, J Baselga, A Haimovitz-Friedman, **DA Heller***: "P-selectin is a Nanotherapeutic Delivery Target to the Tumor Microenvironment." *Science Translational Medicine* 8 (2016) 345ra87. [Highlighted in *Science Translational Medicine* 8 (2016) 374fs11, *Nature Reviews Clinical Oncology* (2016), and *Cancer Discovery* (2016).]
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- (3) **DA Heller**, PW Barone, JP Swanson, RM Mayrhofer, MS Strano*: "Using Raman spectroscopy to elucidate the aggregation state of single-walled carbon nanotubes." *Journal of Physical Chemistry B* 108 (2004) 6905-6909.
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- (7) Z Yaari, E Keblish, M Antman-Passig, D Gwynne, D Goerzen, M Kim, **DA Heller***. "Carbon Nanotubes in Biomedicine: Properties, Methods, and Instrumentation" in *Handbook of Carbon Nanomaterials* (World Scientific, 2025).
- (6) Z Yaari, CP Horoszko, M Antman-Passig, M Kim, FT Nguyen, **DA Heller***. "Emerging Technologies in Cancer Detection" in *Cancer Biomarkers: Clinical Aspects and Laboratory Determination* (Elsevier, 2022.)
- (5) RM Williams, C Kapadia, EA Jaimes, **DA Heller***. "Nanotargeting to the Kidney" in *Regenerative Nephrology* (Academic Press, 2022.)
- (4) PV Jena, C Cupo, **DA Heller***: "Near Infrared Spectral Imaging of Carbon Nanotubes for Biomedicine" in *Near-Infrared-Emitting Nanoparticles for Biomedical Applications* (Springer Nature Switzerland AG, 2019.)

- (3) PW Barone, ES Jeng, **DA Heller**, MS Strano: "Biosensors based on single-walled carbon nanotube fluorescence." in *Handbook of Biosensors and Biochips* (Chichester: John Wiley & Sons, 2007.)
- (2) SK Doorn, **DA Heller**, ML Usrey, PW Barone, MS Strano: "Raman Spectroscopy of Single-Walled Carbon Nanotubes: Probing Electronic and Chemical Behavior." in *Carbon Nanotubes: Properties and Applications* (Boca Raton: Taylor & Francis Group, 2006.)
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PATENTS, STARTUPS, AND SCIENTIFIC ADVISING

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- (2) MS Strano, DA Heller, GW Pratt, J Zhang: Divisional US patent of "Optical Nanosensors Comprising Photoluminescent Nanostructures" #10,012,657 issued July 2, 2018.
- (3) MS Strano, DA Heller, GW Pratt, J Zhang: "Systems and Methods Related to Optical Nanosensors Comprising Photoluminescent Nanostructures." US patent #8,460,608 issued June 11, 2013.
- (4) MS Strano, DA Heller, GW Pratt, J Zhang: Divisional US patent of "Systems and Methods Related to Optical Nanosensors Comprising Photoluminescent Nanostructures" #10,338,051 issued July 2, 2019.
- (5) MS Strano, J Zhang, PW Barone, DA Heller, J-H Kim: "Polymer-Nanostructure Composition for Selective Molecular Recognition." US patent #9,664,677 issued May 30, 2017.
- (6) MS Strano, DA Heller: "Spectral Imaging of Photoluminescent Materials." Patent Application PCT/US10/59897, US20110204258 filed December 10, 2010.
- (7) RS Langer, A Jaklenec, DA Heller, DG Anderson, MS Strano: "Degradable Polymer Nanostructure Materials." US Patent Application 20110280912 filed December 15, 2010.
- (8) DA Heller, J Budhathoki-Uprety: "Helical Polycarbodiimide Polymers and Associated Imaging, Diagnostic, and Therapeutic Methods." Patent appl. US20160067362A1 filed March 10, 2016.
- (9) DA Heller, PV Jena, D Roxbury: "Compositions and methods for monitoring lipid." US patent #10,401,295, issued September 3, 2019.
- (10) DA Heller, Y Shamay: "Fucoidan nanogels and methods of their use and manufacture." US patent #9,737,614 issued July 7, 2016
- (11) DA Heller, Y Shamay: "Dye-Stabilized Nanoparticles and Methods of their Manufacture and Therapeutic Use." Patent application 20200237670 filed November 27, 2019.
- (12) DA Heller, RM Williams: "Mesoscale Nanoparticles for Selective Targeting to the Kidney and Methods of their Therapeutic Use." Patent application PCT/US16/22879 filed March 17, 2016.
- (13) DA Heller, J Massague, L Norton, S Solomon, Y Shamay, G Srimathveeravalli, R Frederiksen: "Capture Device for Detection of Malignant Cells in Blood and Methods Thereof." Patent application PCT/US2016/050916 filed September 9, 2016.
- (14) DA Heller, J Harvey, PV Jena: "Sensors for Nucleic Acid Biomarkers." Patent application PCT/US2017/026592 filed April 7, 2017.
- (15) DA Heller, RM Williams: "SWCNT-DNA-Antibody Conjugates, Related Compositions, and Systems, Methods and Devices for their Use." Patent application PCT/US2017/026563 filed April 7, 2017.
- (16) JD Wolchok, T Merghoub, DA Heller, Y Shamay, DN Khalil: "Bi-Specific Activators for Tumor Therapy" Patent application PCT/US2017/060064 filed April 11, 2017
- (17) M Fushimi, M Scaltriti, DA Heller, et al.: "PI3K Inhibitors and Uses Thereof." Patent application PCT/US2019/054679 filed April 10, 2019.
- (18) DA Heller, CP Horoszkowicz: "Methods Useful in Treating Cancers Harboring a KRAS or HRAS Mutation or Amplification." PCT patent application 62/874,474 filed July 15, 2019.
- (19) DA Heller, RM Williams: "Compositions Comprising Nanoparticles and Methods Thereof." Patent application PCT/US2021/016368 filed March 2, 2021.
- (20) DA Heller, T Irie, R Feiner: "Drug-Eluting Elastic Bands and Ligation." Patent application PCT/US2021/048203 filed September 4, 2021.

- (21) DA Heller, M Kim, M Zheng, A Jagota, Y Wang: "Machine Perception Nanosensor Arrays and Computational Models for Identification of Spectral Response Signatures." Patent application PCT/US2022/013190 filed January 20, 2021.
- (22) V Barthet, C Hinterleitner, DA Heller, S Lowe: "Nanoparticle-based theranostic platform for diagnosis and treatment of senescence-related pathologies." Patent application PCT/US2024/027510 filed May 2, 2024.
- (23) DA Heller, Magdalini Panagiotakopoulos, E Grabarnik: "Galectin-3-targeted and P-selectin-targeted nanotherapies." Patent application PCT/US2024/036162 filed June 28, 2024.
- (24) S Piletsky, DA Heller: "Sensor array for fluorescence diagnostics." Patent application PCT/US2024/039849 filed July 27, 2024.
- (25) BE McLarney, J Grimm, DA Heller, SE Hellmann: "Handheld shortwave infrared imaging system." Patent application PCT/US2025/019720 filed March 13, 2025.
- (26) S Piletsky, DA Heller, E Keblish, A Goffin: "Methods for Covalently Functionalizing Semiconducting Single Walled Carbon Nanotubes and Uses Thereof." Patent application PCT/US2025/054656 filed November 7, 2025.
- (27) D Goerzen, DA Heller, M Kim, J Wollowitz: "Machine Perception Liquid Biopsy Identifies Brain Tumors Via Systemic Immune and Tumor Microenvironment Signature." Patent application PCT/US2026/018147 filed March 6, 2026.

Spinout Companies

<i>Co-Founder with Equity Interest:</i> Block Code Protected Limited	(2025-present)
<i>Co-Founder, CSO, and Board Member with Equity Interest,</i> SAB: Nine Diagnostics, Inc.	(2023-present)
<i>Co-Founder with Equity Interest,</i> SAB: Selectin Therapeutics, Inc.	(2022-present)
<i>Co-Founder with Equity Interest,</i> SAB: Lime Therapeutics, Inc. (formerly Lipidsense)	(2020-present)
<i>Co-Founder with Equity Interest,</i> SAB: Resident Diagnostics, Inc.	(2019-2023)
<i>Co-Founder with Equity Interest,</i> SAB: Goldilocks Therapeutics, Inc.	(2018-2022)

Scientific Advising

<i>Consultant:</i> Metis Therapeutics, Inc.	(2024-present)
<i>Scientific Advisory Board:</i> Celine Therapeutics, Inc.	(2023-present)
<i>Scientific Advisory Board:</i> Mediphage Bioceuticals, Inc.	(2021-present)
<i>Scientific Advisory Board:</i> Nanorobotics, Inc.	(2019-present)
<i>Scientific Advisory Board:</i> Concarlo Therapeutics, Inc. (formerly Concarlo Holdings, LLC)	(2019-present)
<i>Scientific Advisory Board:</i> Oncorus, Inc.	(2018-2019)

ACADEMIC SERVICE, LEADERSHIP, TEACHING, MENTORING, OUTREACH, AND ADVOCACY

Program Leadership

<i>Lead,</i> Research Education Core, CCNY-MSKCC U54 Partnership	(2025-present)
<i>Co-Director,</i> The Pat and Ian Cook Doctoral Program in Cancer Engineering, MSKCC	(2022-present)
<i>Advisor,</i> Tri-Institutional Minority Society Summer Scholars Research Program	(2022-2023)
<i>Co-Founder/Co-Director,</i> Engineering and Imaging Summer Program (formerly Engineering Summer Program), MSKCC/WCM	(2017-present)

External Service

<i>Member,</i> Drug Discovery and Development, Chemistry Subcommittee, 2027 AACR Annual Meeting	(2026-2027)
<i>Chair,</i> Gordon Research Conference in Cancer Nanotechnology	(2023-2025)
<i>Symposium Organizer,</i> Carbon Nanostructures: From Fundamental Studies to Applications and Devices, ECS PRiME Meeting	(2024)
<i>Organizer,</i> Workshop: The Application of AI to Drug Delivery and Controlled Release, Controlled Release Society 2024 Annual Meeting	(2024)
<i>Scientific Advisory Committee Member,</i> Singapore-MIT Alliance for Research and Technology Disruptive & Sustainable Technologies for Agricultural Precision	(2023-present)
<i>Abstract Category Chair for Bioengineering,</i> Kidney Week 2023, American Society of Nephrology	(2023)
<i>Vice Chair,</i> Gordon Research Conference in Cancer Nanotechnology	(2019-2023)
<i>Advisory Board Member,</i> International Conference on the Science and Application of Nanotubes and Low Dimensional Materials	(2022-present)
<i>Chair,</i> Advances in Diagnostics and Therapeutics Session: "Advances in Drug Delivery", American Association of Cancer Research	(2021)
<i>Local Organizer – 21st</i> International Conference on the Science and Application of	(2020-2021)

Nanotubes and Low-Dimensional Materials

<i>Lead Organizer</i> , Symposium on Carbon Nanomaterials Biology, Medicine & Toxicology,	(2020-present)
International Conference on the Science and Application of Nanotubes and Low Dimensional Materials	
<i>Chair</i> , Preclinical Radiotherapeutics Section, Annual Meeting Program Committee,	(2020)
American Association of Cancer Research	
<i>Organizer and Chair</i> , Educational Session:	(2020)
“Engineering and Physical Sciences Approaches in Cancer Research, Diagnosis, and Therapy”,	
American Association of Cancer Research	
<i>Annual Meeting Education Committee</i> , American Association of Cancer Research	(2020-2021)
<i>Session Chair</i> , Drug Delivery, MRS Fall Meeting	(2019)
<i>Chair</i> - 2019 APS Interface of Mathematical Models and Experimental Biology:	(2019)
Role of the Microvasculature Conference	
<i>Lead Organizer</i> , “Nanoinformatics” Session, Colloids Division, American Chemical Society	(2019)
Fall 2019 National Meeting	
<i>Organizer</i> , 10th Symposium on Carbon Nanomaterials Biology, Medicine & Toxicology	(2019)
<i>Co-Lead Organizer</i> , In Vivo Biosensing Network Meeting, MSKCC	(2019)
<i>Co-Founder</i> , In Vivo Biosensing Network (Network of Excellence Grant, Monash University)	(2019-2021)
<i>Session Co-Chair</i> , Biomedical Engineering Society Annual Meeting	(2017)
<i>Member</i> , NIH NCIP Nanomedicine Data Reporting Working Group	(2017-present)
<i>Participant</i> , NCI Strategic Workshop on Emerging Technologies and Interdisciplinary Team Formation	(2017)
<i>Lead Organizer</i> , Carbon Nanostructures in Medicine and Biology Symposium,	(2017-2023)
Nanocarbons Division, The Electrochemical Society	
<i>Advisory Board Member</i> , International Conference on the Science and Application	(2016-2019)
of Nanotubes and Low Dimensional Materials	
<i>Organizing Committee</i> , Bio Nano Med Symposium, City University of New York	(2016)
<i>Board of Directors</i> , Rice Alumni in Medicine, Rice University	(2015-2020)
<i>Executive Committee</i> , Nanocarbons Division, The Electrochemical Society	(2015-present)
<i>Symposium Organizer</i> , Carbon Nanostructures in Medicine and Biology Symposium,	(2013-present)
Nanocarbons Division, The Electrochemical Society	

Internal Service (MSKCC & WCM)

<i>Chair</i> , Laboratory Research Oversight Committee, MSKCC	(2025-present)
<i>Chair</i> , Curriculum Committee, The Pat and Ian Cook Doctoral Program in Cancer Engineering	(2024-present)
<i>Member</i> , Sloan Kettering Institute Committee on Appointments and Promotions	(2024-present)
<i>Member</i> , Executive Committee, Molecular Pharmacology Program, MSKCC	(2022-present)
<i>Member</i> , Executive Committee, Cancer Engineering Research Initiative, MSKCC	(2021-present)
<i>Member</i> , Laboratory Research Oversight Committee, MSKCC	(2020-2024)
<i>Member</i> , Physiology Biophysics & Systems Biology Department Executive Committee, WCM	(2019-present)
<i>Member</i> , Weill Cornell Graduate School Awards Committee, WCM	(2019-2024)
<i>Member</i> , Junior Faculty Search Committee, MSKCC	(2017-present)
<i>Co-Founder and Executive Committee Member</i> , Technology and Engineering Group, MSKCC	(2017-2020)
<i>Member</i> , Innovation and Technology Team, Department of Surgery, MSKCC	(2016-2018)
<i>Pharmacology Task Force Member</i> , Research Strategic Vision and Planning, MSKCC	(2017)
<i>Faculty Organizer</i> , Tri-Institutional Chemical Biology Graduate Program Symposium	(2016-2023)
<i>Member</i> , Junior Faculty Emerging Leaders Program, MSKCC	(2016)
<i>Member</i> , Faculty Advisory Council, BioVenture Entrepreneurship Laboratory, WCM	(2016-present)
<i>Member</i> , Department of Pharmacology Graduate Retreat Committee, WCM	(2015-2016)
<i>Member</i> , Physiology, Biophysics, and Systems Biology Graduate Program Retreat Committee, WCM	(2015-2016)
<i>Member</i> , Oversight Committee, Molecular Cytology Core Facility, MSKCC	(2015-present)
<i>Executive Committee Member</i> , Center for Molecular Imaging & Nanotechnology	(2014-present)
(now Center for Molecular Imaging and Bioengineering), MSKCC	
<i>Member</i> , Junior Faculty Council, MSKCC	(2013-2016)
<i>Facilitator</i> , Responsible Conduct of Research Course, MSKCC	(2013-present)

Course Leadership

Founder/Instructor, “Foundations in Cancer Engineering”, Gerstner Sloan Kettering Graduate Program (2024-present)
An introductory course for students in The Pat and Ian Cook Doctoral Program in Cancer Engineering which covers major concepts including pharmacology, drug development, nanotechnology, biomarkers, and laboratory diagnostics.

Co-Founder/Co-Director, “Drug Development from Molecule to Prescription”, Weill Cornell Medicine (2017-present)
 A Department of Pharmacology course in collaboration with Roche to provide a foundation of integrated knowledge of the multi-disciplined process of drug development.

Co-Founder/Co-Director/Advisor, “Accelerating BioVenture Innovation”, Weill Cornell Medicine (2014-present)
 Formerly “From Bench to Bedside: Business Fundamentals for Entrepreneurial Scientists.” Founded hands-on course administered through the Department of Pharmacology to teach the basic principles of entrepreneurship to trainees in biomedical research and medicine. The course has resulted in 10+ funded startup companies to date.

Course Lecturer

Lecturer, “Foundations in Cancer Engineering”, Gerstner Sloan Kettering Graduate School (2024-present)
Lecturer, “CCNY/MSK Partnership Cancer Biology Course”, The City College of New York (2019)
Lecturer, “Next-Generation Methods for Neuroscience and Pharmacology”, Weill Cornell Medicine (2016-present)
Lecturer, “Essential Principles in Pharmacology and Drug Development”, Weill Cornell Medicine (2015-present)
Lecturer, “Pharmacology I: Chemical Biology,” Weill Cornell Medical College (2012-2020)
Lecturer, “Molecular Pharmacology of Cancer,” Weill Cornell Medical College (2012-present)

Host Laboratory/Mentor: Undergraduate and Medical Students, Training Programs

Mentor, Engineering and Imaging Summer Program, MSKCC (2025-present)
Mentor, CCNY-MSK Partnership for Cancer Research, Training, and Community Outreach (2021-present)
Mentor, Tri-Institutional Minority Society Summer Scholars Research Program (2019-2023)
Mentor, Gateways to the Laboratory Program, Weill Cornell Medicine (2019-present)
Mentor, Engineering Summer Program, MSKCC/WCM (2018-2024)
Mentor, ACCESS Summer Internship Program, Weill Cornell Medicine (2017-present)
Mentor, Molecular Imaging Summer Program, MSKCC (2017-2024)
Mentor, Summer Medical Student Research Fellowship Program, MSKCC (2016-present)
Mentor, Undergraduate and high school students, MSKCC (2013-present)
Mentor, Summer Undergraduate Research Program students, MSKCC (2012-present)
Mentor, Undergraduate Research Opportunities Program Scholars, MIT (2008-2012)
Mentor, Intel/Lockheed Martin Undergraduate Research Scholar, University of Illinois (2005-2006)
Mentor, Undergraduate researchers, University of Illinois (2003-2006)

Outreach and Advocacy

Policy Brief, Balancing Safety and Innovation: Shaping Responsible Carbon Nanotube Policy, Baker Institute for Public Policy. <https://doi.org/10.25613/PV4W-V980> (2024)
Art Exhibits, Joseph Cohen/Heller Lab Collaborations, Memorial Sloan Kettering Cancer Center (2020-present)
Advocacy, “Banning Carbon Nanotubes Would be Scientifically Unjustified and Damaging to Innovation,” *Nature Nanotechnology* correspondence. <https://doi.org/10.1038/s41565-020-0656-y> (2020)
Panelist, Academic Job Search Bootcamp, Office of Career and Professional Development, MSKCC (2020-2021)
Outreach, Making Strides Against Breast Cancer Walk, American Cancer Society (2019-present)
Presenter, “Nanocarbons Through the Artist’s Lens” Stage Talk at 2019 Materials Research Society (2019)
Panelist, “Material Collaborations in Arts & Science” Rice University and Methodist Research Institute (2018)
Guest Lecturer, “Science on Stage: Science & Solo Performance” The New School, NY (2017)
Panelist, “City of Science, Can Nanotechnology Revolutionize Medicine?” City University of NY (2017)
Outreach, Hands-on Activities and Discussion, NYC DOE Career Day (2017)
Outreach, Hands-on and Career Development Activities at the Math, Engineering, and Science Academy (MESA), Brooklyn (2016-present)
Faculty Discussion Leader, ACCESS Summer Program Journal Club, WCM (2016-2019)
Panelist, “Panel on Interviewing for Faculty Jobs”, Office of Career Services, MSKCC (2016)
Artist Residency Host Lab, “Nano-Paint”, Joseph Cohen, Visual Artist (2015-present)
Artist Residency Host Lab, “Well Plate Utopias”, Matej Vakula, Mixed Media Artist (2015-2017)
Consultant, Panelist, “Science Fair: An Opera with Experiments”, Hai-Ting Chinn, Mezzo-Soprano (2015)
Panelist, “How to Choose a Postdoc,” Office of Career Services, MSKCC (2015)
Artist Residency Host Lab, “Art of Science”, Ligo Project (2014)
Lecturer, “Major Trends in Modern Cancer Research”, MSKCC (2014)
Curator, Welch Chemistry Hall, Houston Museum of Natural Science, Houston, TX (2012-2014)
Guest Lecturer, Museum of Science, Boston, MA (2011-2012)
Board of Exhibits, Orpheum Children’s Science Museum, Urbana, IL (2005-2006)
Board of Directors, Wizard, Illinois Renaissance Festival, Danville, IL (2004-2012)

Mentorship: Current and Former Lab Trainees

Current Laboratory Members: 4 postdocs, 10 PhD students (incl. 5 co-advised), 2 clinical investigators, 1 technician, 2 high school students

Former Trainees: 11 postdocs, 10 PhD students including one MD-PhD student, 1 clinical fellow, 1 postbaccalaureate Bridge Fellow

Mentorship: PhD Thesis, Candidacy, and Scholarly Oversight Committees

Served on over 20 thesis committees, 30 doctoral candidacy exam committees, and one medical research scholarly oversight committee.

PROFESSIONAL ORGANIZATIONS

<i>Interdisciplinary Science and Technology Subcommittee</i> , The Electrochemical Society	(2025-present)
<i>Smalley/Haddon Awards Committee</i> , The Electrochemical Society	(2025-present)
<i>Clinical Cancer Research Awards Committee</i> , American Association of Cancer Research	(2023-present)
<i>Steering Committee</i> , Nanocarbons Division, The Electrochemical Society	(2020-present)
<i>Education Committee</i> , American Association of Cancer Research	(2019-2021)
<i>Editorial Board Member</i> , Chemistry in Cancer Research, American Association of Cancer Research	(2017-2021)
<i>Member at Large</i> , Nanocarbons Division, The Electrochemical Society	(2015-present)
<i>Member</i> , Controlled Release Society	(2019-present)
<i>Member</i> , American Society of Nephrology	(2019-present)
<i>Member</i> , American Association of Cancer Research	(2012-present)
<i>Member</i> , Biomedical Engineering Society	(2017-present)
<i>Member</i> , Materials Research Society	(2009-present)
<i>Member</i> , The Electrochemical Society	(2013-present)
<i>Member</i> , American Chemical Society	(2002-present)

GRANT REVIEWER

NIH Special Emphasis Panel/Scientific Review Group ZRG1 BBBT-T (87) S, Special Topics in Biomaterials, Nanoscience, and Gene and Drug Delivery	(2026)
Natural Sciences and Engineering Research Council of Canada (NSERC)	(2025)
American Cancer Society Cancer Progression and Detection Award Committee	(2025)
Yosemite-American Cancer Society Award Committee	(2025)
NSF Biosensing Panel, CBET Division, Directorate of Engineering	(2023)
NSF Nanoscale Interactions Panel, CBET Division, Engineering Directorate	(2023)
NIH Study Section: Gene and Drug Delivery (GDD) Ad Hoc Reviewer	(2021)
NIH Director's New Innovator Award (DP2) Review Panel	(2020, 2021)
FY20 Breast Cancer Research Program, Department of Defense Congressionally Directed Medical Research Programs (CDMRP)	(2020)
Swiss National Science Foundation	(2019-present)
NIH NIGMS Collaborative Program Grant for Multidisciplinary Teams (RM1)	(2018, 2020)
Israel Science Foundation	(2018-present)
<i>Standing Member</i> , Venture Philanthropy Fund Review Committee, Crohn's & Colitis Foundation	(2018-2021)
NIDDK Review Panels, Developmental Centers in Benign Urology (P20)	(2017-2019)
NIDDK ZDK1 GRB-3 O2, ZDK1 GRB-M O5, ZDK1 GRB-M (O3)	
NIH Study Section: Enabling Bioanalytical and Imaging Technologies (EBIT), Ad Hoc Reviewer	(2016)
NCI Special Emphasis Panel, U54 Centers of Cancer Nanotechnology Excellence (CCNE)	(2015)

JOURNALS – EDITOR/PEER REVIEWER

Editorial Board Member, Precision Nanomedicine, European Foundation for Clinical Nanomedicine (2021-)
Peer reviewer for the following journals: ACS Applied Materials & Interfaces, ACS Nano, ACS Sensors, Advanced Biosystems, Advanced Functional Materials, Advanced Healthcare Materials, Advanced Materials, Advanced Materials Interfaces, Advanced Science, Analytical Chemistry, Cancer Research, Carbon, Chemical Physics Letters, Colloids and Surfaces B: Biointerfaces, eLife, Environmental Science & Technology, JACS, Journal of Biological Physics, Journal of Clinical Investigation, JCI Insight, Journal of Controlled Release, Journal of Materials Chemistry B, Journal of Nuclear Medicine, Journal of Physical Chemistry, Langmuir, Light: Science & Applications, Nano Letters, Nanoscale, Nature Communications, Nature Materials, Nature Nanotechnology, Nature Protocols, Nature Reviews Materials, PLoS One, PNAS, Small, Science Advances, Science Translational Medicine

PRESENTATIONS

Invited Talks – Seminars

Department of Chemical and Biomolecular Engineering, Columbia University	(11/2025)
Bioengineering Seminar, Georgia Institute of Technology	(1/2025)
Icahn Genomics Institute Seminar, Icahn School of Medicine at Mount Sinai	(2/2024)
Bioengineering Seminar, Lehigh University, Bethlehem, PA	(9/2023)
Center for Cancer Research, National Institutes of Health, Frederick, MD	(7/2023)
Physical Sciences in Oncology Center, University of Pennsylvania	(5/2022)
Center for Research on Reproduction and Women's Health Seminar, University of Pennsylvania	(4/2022)
In-vivo Cellular Molecular Imaging Center, Johns Hopkins University	(3/2022)
Department of Chemical and Biomolecular Engineering, NYU	(9/2021)
Institute of Biosciences and Bioengineering, Rice University	(7/2021)
Tisch Cancer Institute, Icahn School of Medicine at Mount Sinai	(7/2021)
Seminars in Vascular Biology, Harvard Medical School	(5/2021)
BioMedical Engineering and Imaging Institute Seminar, Icahn School of Medicine at Mount Sinai	(4/2021)
University of Florida Health Cancer Center Oncology Grand Rounds	(2/2021)
College of Pharmacy, St. John's University	(10/2020)
Bioengineering Colloquium, Rice University	(9/2020)
Department of Biochemistry, Albert Einstein College of Medicine	(1/2020)
Department of Industrial and Physical Pharmacy Seminar, Purdue University	(10/2019)
Department of Chemistry, University College Dublin	(10/2019)
John A Paulson School of Engineering and Applied Sciences, Harvard University	(10/2019)
Physics Department Colloquium, University of Rhode Island	(9/2019)
Rutgers Center for Lipid Research Seminar, Rutgers University	(9/2019)
DeWitt Goodman Seminar Series, New York Obesity Nutrition Research Center, Columbia University	(4/2019)
New York University Nanoscience Discussion Group, NYU Chemistry Department	(3/2019)
Meinig School of Biomedical Engineering, Cornell University	(11/2018)
BUNano Symposium, Boston University	(11/2018)
Vienna BioCenter PhD symposium, Vienna, Austria	(11/2018)
Department of Pharmacological Sciences, Icahn School of Medicine at Mount Sinai	(11/2018)
Distinguished Scientist Lecture Series, Institute for Research in Immunology and Cancer, University of Montréal	(9/2018)
Modern Optics Seminar, Massachusetts Institute of Technology	(4/2018)
Nanoscale Science Seminar, Dept. of Chemistry, University of North Carolina, Charlotte	(3/2018)
Department of Biomedical Engineering, New Jersey Institute of Technology	(3/2018)
Department of Biomedical Engineering, City College of New York	(2/2018)
Orthopaedic Soft Tissue Research Program, Hospital for Special Surgery	(2/2018)
Molecular Engineering & Sciences Institute, University of Washington	(1/2018)
Department of Biochemistry, University of Vermont Larner College of Medicine	(12/2017)
Biodesign Institute, Arizona State University	(10/2017)
Cellular Biology and Anatomy Seminar Series, Georgia Health Sciences University	(8/2017)
Biomedical Engineering Department, Carnegie Mellon University	(8/2017)
Tissue Microenvironment Seminar Series, University of Illinois at Urbana-Champaign	(5/2017)
Polymer Program Seminar, Institute of Materials Science, University of Connecticut	(2/2017)
Radiation Oncology Department, Columbia University College of Physicians and Surgeons	(12/2016)
Department of Chemistry, Clemson University	(2/2016)
Institute of Chemical Sciences and Engineering, Ecole Polytechnique Federale de Lausanne	(10/2015)
Chemistry Department Seminar, Fort Lewis College	(10/2015)
National Institute of Nutrition, Hyderabad	(5/2015)
Bombay College of Pharmacy, Mumbai	(4/2015)
Department of Chemistry and Biochemistry, Queens College, City University of New York	(3/2015)
Department of Chemical and Biomolecular Engineering, Lehigh University	(9/2014)
Department of Physics, Universidad de los Andes, Bogota	(9/2014)
Integrated Cancer Research Seminar Series, Georgia Institute of Technology	(4/2013)
ICB Seminar Series, Institute for Chemical and Biological Engineering, ETH Zurich	(11/2011)
Fassberg Seminar Series, Max Planck Institute for Biophysical Chemistry, Göttingen	(11/2011)

Institut für Physikalische u. Theoretische Chemie, Universität Würzburg	(11/2011)
Advanced Technology Institute, University of Surrey	(7/2011)
Universidad Nacional de Colombia, Bogota	(8/2008)
Universidad de Los Andes, Bogota	(8/2008)
Indian Institute of Technology Bombay	(12/2007)
Semmelweis University, Budapest	(6/2006)

Invited Talks - Meetings and Conferences

Lorentz workshop: AI-driven Nanoparticle Design for Drug Delivery (Keynote)	(2/2026)
Pacificchem Conference	(12/2025)
FASEB Meeting on Hematologic Malignancies	(7/2025)
Controlled Release Society Meeting, Philadelphia, PA	(7/2025)
Electrochemical Society Meeting	(5/2025)
Gordon Research Conference in Supramolecular Chemistry and Self Assembly	(5/2025)
Northeast Bioengineering Conference, NYU (Keynote)	(4/2025)
Cancer Engineering Summit, Moffitt Cancer Center	(2/2025)
Keystone Symposia on Tumor Microenvironment: Metastasis and the Host	(1/2025)
AACR Special Conference in Cancer Research: Ovarian Cancer (Plenary)	(10/2023)
Controlled Release Society 2023 Annual Meeting	(7/2023)
University of New Hampshire Bioengineering Symposium	(5/2023)
Carbon Hub Annual Meeting, Rice University	(5/2023)
American Association of Cancer Research 2023 Annual Meeting	(3/2023)
Monash Future Sensing Conference, Monash University (Plenary)	(11/2022)
A Celebration in Honor of Bruce Zetter, PhD, 50 Years in Cancer Research	(11/2022)
Workshop on Nanotube Optics and Nanospectroscopy	(7/2022)
American Association of Cancer Research Annual Meeting	(4/2022)
New York Cancer Genomics Research Network Meeting, New York Genome Center	(2/2022)
American Association of Pharmaceutical Scientists 2021 PharmSci 360	(10/2021)
CRUK The Early Detection of Cancer Conference	(10/2021)
Israel Chapter of the Controlled Release Society ICRS-PAT 2021 Joint Workshop	(10/2021)
E-MRS 2021 Fall Meeting	(9/2021)
Molecular Foundry Annual User Meeting, Lawrence Berkeley National Laboratory	(8/2021)
Materials Research Society Spring Virtual Meeting	(4/2021)
Keystone eSymposia on Fatty Liver Disease and Multi-System Complications	(3/2021)
<i>Keynote Address</i> , Symposia on the Application of Nanotechnology in the field of Benign Urologic Disease, Society of Pelvic Research Annual Meeting	(12/2020)
American Institute of Chemical Engineers Annual Meeting	(11/2020)
ACORN Summer School and Thematic Workshop	(10/2020)
American Association of Cancer Research 2020 Annual Meeting	(6/2020)
Parseghian Scientific Conference for Niemann-Pick Type C Research	(6/2020)
American Institute of Chemical Engineers 2019 Annual Meeting	(11/2019)
2019 Controlled Release Society Annual Meeting	(7/2019)
Gordon Research Conference in Cancer Nanotechnology	(6/2019)
Parseghian Scientific Conference for Niemann-Pick Type C Research	(6/2019)
235th Electrochemical Society Meeting	(5/2019)
11th AACR-JCA Joint Conference on Breakthroughs in Cancer Research	(2/2019)
American Institute of Chemical Engineers 2018 Annual Meeting	(10/2018)
Bob Langer 70th Birthday Symposium, Cambridge, MA	(9/2018)
Nanomedicine Symposium, 256th American Chemical Society National Meeting	(8/2018)
7th Workshop on Nanotube Optics and Nanospectroscopy, Hakone, Japan	(7/2018)
9th Symposium on Carbon Nanomaterials Biology, Medicine & Toxicology, Beijing, China	(7/2018)
15th US-Korea Nanoforum, Seoul, Korea	(7/2018)
233rd Electrochemical Society Meeting	(5/2018)
National Science Foundation (NSF) - Funding Opportunities for Nano-Biosensing and Early Career Investigators, The Pittsburgh Conference	(3/2018)
<i>Plenary</i> , The 14th US-Japan Symposium on Drug Delivery Systems	(12/2017)
Helene Ross Bogutz Early Detection Ovarian Cancer Symposium, University of Pennsylvania	(10/2017)
Tri-Institutional Chemical Biology Graduate Program Symposium, faculty invited speaker	(9/2017)
Multimodal Imaging with Colloids Symposium, 254 th American Chemical Society National Meeting	(8/2017)
TSRC Workshop on Defect Chemistry and Physics of Low Dimensional Materials, Telluride	(7/2017)
NYC Life Science Innovation Showcase, Alexandria Center	(6/2017)

Canadian Society of Nephrology, Montreal, Canada	(5/2017)
231 st Electrochemical Society Meeting	(5/2017)
New York Nanoscience Discussion Group, NYU	(2/2017)
Center for Targeted Therapeutics and Translational Nanomedicine (CT ³ N) 2016 Symposium, University of Pennsylvania	(12/2016)
Nanotubes and Related Nanostructures Symposium, 2016 Materials Research Society Fall Meeting	(11/2016)
National Cancer Institute/INCa/Aviesan Next Gen Nano Cancer Symposium, Paris	(11/2016)
Materials Science & Technology 2016 Conference, Salt Lake City	(10/2016)
Seventeenth International Conference on the Science and Applications on Nanotubes and Low-Dimensional Materials, Vienna	(8/2016)
8/2016 - 7 th Symposium on Carbon Nanomaterials Biology, Medicine, & Toxicology, Vienna	(5/2016)
European Materials Research Society, Lille	
NYC Life Science Innovation Showcase, Alexandria Center	(11/2015)
227 th Electrochemical Society Meeting, Chicago	(5/2015)
<i>Plenary speaker</i> , Israel Institute of Chemical Engineers 50 th Anniversary Conf., Tel-Aviv	(2/2015)
Kavli Frontiers of Science Israeli-American Symposium, Jerusalem	(2/2015)
<i>Keynote speaker</i> , Nanoscience NY Symposium, CUNY Advanced Science Research Center	(2/2015)
Materials Research Society Fall Meeting	(12/2014)
International Symposium on Integrated Functionalities, Materials Research Society	(7/2013)
223 rd Electrochemical Society Meeting, Toronto, Canada, May 2013	(5/2013)
Gordon Research Seminar in Bioanalytical Sensors	(6/2012)
Cancer Community at Illinois Symposium, University of Illinois at Urbana-Champaign	(4/2012)
238 th American Chemical Society National Meeting	(8/2009)

Other Meetings/Seminars

The 15th US-Japan Symposium on Drug Delivery Systems	(12/2019)
Materials Research Society Fall Meeting, Boston, MA	(12/2019)
American Society of Nephrology Kidney Week 2019	(11/2019)
American Association of Cancer Research Annual Meeting 2019	(4/2019)
Biomedical Engineering Society 2018 Annual Meeting	(10/2018)
American Association of Cancer Research Annual Meeting 2018	(4/2018)
Materials Research Society Fall Meeting, Boston, MA	(11/2017)
American Institute of Chemical Engineers Annual Meeting, Minneapolis, MN	(10/2017)
Biomedical Engineering Society Annual Meeting, Phoenix, AZ	(10/2017)
Gordon Research Conference in Molecular and Cellular Biology of Lipids, Waterville Valley, NH	(7/2017)
Gordon Research Conference in Cancer Nanotechnology, West Dover, VT	(6/2017)
American Association of Cancer Research, Washington, DC	(4/2017)
Deuel Conference on Lipids, Monterey, CA	(3/2017)
Gordon Research Conference in Drug Carriers in Medicine and Biology, Waterville Valley, NH	(8/2016)
229 th Electrochemical Society Meeting, San Diego	(6/2016)
SPIE Photonics West Conference, San Francisco, CA	(2/2016)
World Molecular Imaging Conference, Honolulu, HI	(9/2015)
Gordon Research Conference in Cancer Nanotechnology, West Dover, VT	(7/2015)
Gordon Research Conference in Drug Carriers in Medicine and Biology, Waterville Valley, NH	(8/2014)
Gordon Research Conference in Bioanalytical Sensors, Newport, RI	(6/2014)
Nanotechnologies in Cancer Diagnosis, Therapy, and Prevention, New York Academy of Sciences	(6/2013)
Gordon Research Conference in Cancer Nanotechnology, Waterville, ME	(7/2011)
Gordon Research Conference in Drug Carriers, Waterville Valley, NH	(8/2010)
American Chemical Society National Meeting, Boston, MA	(8/ 2010)
2 nd Carbon Nanotube Biology, Medicine & Toxicology Satellite Symposium, Tenth International Conference on the Science and Application of Nanotubes, Beijing, China	(6/2009)
American Chemical Society National Meeting, Salt Lake City, UT	(3/2009)
American Chemical Society National Meeting, Philadelphia, PA	(8/2008)
Eighth International Conference on the Science and Application of Nanotubes, Ouro Preto, Brazil	(6/2007)
American Chemical Society National Meeting, San Francisco, CA	(8/2006)
American Chemical Society National Meeting, New Orleans, LA	(3/2003)

Internal

Tri-Institutional PhD Program in Chemical Biology Symposium, student-selected speaker	(9/2017)
Molecular Imaging & Therapy Seminar, Department of Radiology	(3/2016)
Molecular Imaging & Therapy Seminar, Department of Radiology	(11/2014)

RESEARCH SUPPORT

Selected Active Research Support

R01-CA305504	9/1/2026 – 8/31/2030
National Cancer Institute	Role: Principal Investigator (MPI)
Title: P-Selectin-Targeting Nanoparticles to Potentiate Cancer Immunotherapy	
LIGHT Program Award	11/5/2025-10/31/2027
ARPA-H	Roles: TA1 Lead, Product Development Lead
Title: LANTERN: Lymphatic disease Advancements with Nanotechnology, Translational Epigenetics, and Research in Genetics	
R01-NS122987	9/1/2022 - 8/31/2027
National Institute of Neurological Disorders and Stroke	Role: Co-Investigator
Title: Inducing neural maturation in medulloblastoma by targeting EZH2	
R01 EB033651	6/15/2023 – 4/30/2027
National Institute of Biomedical Imaging and Bioengineering	Role: Principal Investigator
Title: Nanosensor Array Platform to Capture Whole Disease Fingerprints	
NSF 2323759	10/1/2023 - 9/30/2027
National Science Foundation	Role: Principal Investigator
DMREF: DNA-Nanocarbon Hybrid Materials for Perception-Based, Analyte-Agnostic Sensing	

Selected Past Research Support

W81XWH2210563	6/15/2022 - 6/14/2025
Congressionally Directed Medical Research Programs	Role: Principal Investigator
Title: Implantable Nanosensor for Early-Stage Ovarian Cancer Detection.	
R01-DK129299	7/1/2021 - 5/31/2025
National Institutes of Health	Role: Co-Investigator
Title: Nanotechnology as a therapeutic approach in arteriovenous fistula maturation	
R01-NS116353	3/15/2020 – 12/31/2024
National Institute of Neurological Disorders and Stroke	Role: Principal Investigator (MPI)
Title: Tumor-Selective Delivery Approaches for Medulloblastoma	
R01-CA215719	12/2017 – 11/2022
National Cancer Institute	Role: Principal Investigator
Title: P selectin Mediated Targeting of PI3K Nanomedicines to the Tumor Microenvironment	
R01 DK119489-01	8/1/2018 - 7/31/2021
National Institutes of Health	Role: Principal Investigator
Title: Renal tubule-specific nanotherapeutics for acute kidney injury	
DP2-HD075698	9/30/2012 - 8/31/2017
National Institutes of Health	Role: Principal Investigator
Title: Transient Metabolite Detection for Single-Cell Metabolomics and Diagnostics	