JAMES ELIA

Yale Experimental Pathology PhD candidate | (508) 243-9061 | james.elia@yale.edu | https://www.linkedin.com/in/jlelia/

EDUCATION

§ Doctorate of Philosophy in Pathology and Molecular Medicine, Yale School of Medicine, *currently enrolled*

§ Bachelor of Science in Biology with Minor in Chemistry, University of Massachusetts Amherst, *Spring 2021*

- Commonwealth Honors College, Departmental Honors in Biology, Phi Beta Kappa - Nu Chapter
- 3.963 GPA, 4.0 major GPA

RESEARCH EXPERIENCE

Graduate Researcher with Dr. Ranjit Bindra **January 2022 to present**

Yale - Department of Experimental Pathology

- Combine synthetic chemistry and cell biology to create therapeutics targeting DNA-repair-deficient cancers
- Design novel DNA-damaging agents to interrogate human DNA repair
- Reduce the toxicity and increase the efficacy of alkylating agents by determining structure activity relationship (SAR)

Undergraduate Researcher with Dr. Vincent Rotello **Sept 2018 to May 2021**

UMass Amherst - Department of Chemistry

- Applied gold-core and polymeric nanomaterials to biological systems
- Co-engineered biologics and nanoparticles for the direct delivery of siRNA, mRNA, and protein
- Optimized delivery of CRISPR/Cas9 ribonucleoprotein (RNP) directly to the nucleus for gene editing

Undergraduate Researcher with Dr. Lynn Adler **Jan 2018 to Sept 2018**

UMass Amherst - Department of Biology

- Characterized disease transmission in the common eastern bumblebee and European honey bee
- Appointed as lab manager in Dr. Adler and Dr. Van Wyk's absences; led a team of eight researchers

UNDERGRADUATE HONORS THESIS

Comparing two delivery systems for efficient *in vitro* human gene editing

The Rotello Research Group specializes in the use of nanomaterials in biological systems. Two nanomaterials that have shown great promise in the delivery of biologics are the arginine-functionalized gold nanoparticle (ArgNP) and the poly(oxanorborneneimide) homopolymer (PONI). I compared the in vitro Cas9-mediated editing efficiency of these two systems by knocking out blue fluorescent protein (BFP) in modified human cells and quantifying the results using flow cytometry. The 60 kDa PONI polymer demonstrated the greatest knockout efficiency, suggesting its preferential use for future Cas9-mediated gene editing.

PUBLICATIONS

E.D. Huseman, A. Lo, O. Fedorova, **J.L. Elia**, S.E. Gueble, K. Lin, R.K. Sundaram, J. Oh, J. Liu, F. Menges, M.G. Rees, M.M. Ronan, J.A. Roth, V.S. Batista, J.M. Crawford, A.M. Pyle, R.S. Bindra*, S.B. Herzon*. **Mechanism of Action of KL-50, a Candidate Imidazotetrazine for the Treatment of Drug-Resistant Brain Cancers**. *Journal of the American Chemical Society*. 30 May 2024.

D.C. Luther, R. Goswami, Y-W. Lee, T. Jeon, R. Huang, **J.L. Elia**, H. Nagaraj, J.J.E. Bijlsma, M. Piest, M.A. Langereis, V.M. Rotello*. **Non-viral vaccination through cationic guanidium polymer-pDNA polyplex mediated gene transfer**. *Nanoscale*. 30 May 2023.

T. Jeon, D.C. Luther, R. Goswami, C. Bell, H, Nagaraj, Y.A. Cicek, R. Huang, J.A. Mas Rosario, **J.L. Elia**, J. Im, Y-W. Lee, Y. Liu, F. Scaletti, M.E. Farkas, J. Mager, V.M. Rotello*. **Engineered Polymer-siRNA Polyplexes Provide Effective Treatment of Lung Inflammation**. *American Chemical Society Nano*. 14 Feb 2023.

D.C. Luther, Y. Lee, H. Nagaraj, V. Clark, T. Jeon, R. Goswami, S. Gopalakrishnan, S. Fedeli, W. Jerome, **J.L. Elia**, and V.M. Rotello*. **Cytosolic Protein Delivery Using Modular Biotin–Streptavidin Assembly of Nanocomposites**. *American Chemical Society Nano*. 18 Apr 2022.

S. Fedeli/J. Im, S. Gopalakrishnan, **J.L. Elia**, A. Gupta, D. Kim, and V.M. Rotello*. **Nanomaterial-based bioorthogonal catalysts in biological environment**. *Chemical Society Reviews*. 15 Nov 2021.

Y. Lee, D.C. Luther, R. Goswami, T. Jeon, V. Clark, **J. Elia**, S. Gopalakrishnan, V.M. Rotello*. **Direct Cytosolic Delivery of Proteins through Coengineering of Proteins and Polymeric Delivery Vehicles**. *Journal of the American Chemical Society*. 12 Feb 2020.

GRANTS

NIH T32 Kirschstein National Research Service Award (NRSA) **Awarded Sept 2022, Sept 2023**

Awarded by Yale Cancer Biology Training Program leadership to fund my graduate research on novel cancer therapeutics

Commonwealth Honors College Research Grant **Awarded Sept 2020**

Awarded by the Commonwealth Honors College leadership via a competitive application to fund my undergraduate research.

TEACHING EXPERIENCE

Teaching Fellow - Biology of Cancer **January 2024 to May 2024**

Yale University

- Taught a course on the molecular fundamentals of cancer biology (PATH 650).

Mentor **December 2022 to present**

Education Equity Mentorship Company

- Volunteer tutoring, SAT/ACT prep, and college essay editing for underserved high school students at no cost.

STEM Tutor **March 2021 to December 2022**

Granite State Tutors / private tutor

- Tutored elementary through college biology, chemistry, physics, math, and writing.

Teaching Assistant - Evolution **September 2019 to May 2021**

UMass Amherst

- Taught courses on introductory (BIOL 109) and advanced (BIOL 280) evolutionary biology.

LEADERSHIP AND OTHER EXPERIENCE

Chief Graduate Student **September 2023 to present**

Yale Pathology Department

- Chosen by faculty to act as a liaison between faculty and graduate students (research analogue of Chief Resident).

Executive Director/Founder **December 2022 to present**

Education Equity Mentorship Company

- Founded a non-profit organization that gives free tutoring and college prep to students facing financial hardship.

Cancer Biology Training Program **September 2022 to present**

Yale School of Medicine

- Certificate program that gives PhD trainees deep academic and clinical experience in cancer biology.

Pathology DICE committee member **Sept 2022 to present**

Yale Pathology Department

- Chosen by faculty to advocate for diversity, inclusivity, culture, and equity (DICE) in the Pathology department.