Ryan Molony, Ph.D.

7 Fieldstone Lane
West Henrietta, NY 14586

rd.molony@gmail.com
(860)-810-6768

EDUCATION

Ph.D.	Yale University Immunobiology	December 2017
M.S.	Yale University Immunobiology	May 2015
M.S.	University of Connecticut Cell Biology	May 2012
B.S.	University of Connecticut Molecular and Cell Biology, *summa cum laude*	May 2011

EDITING EXPERIENCE

Zhengzhou Wenxin Translation Corporation 2016 – Present
Freelance Editor

RESEARCH EXPERIENCE

Novartis Institutes for BioMedical Research 2017 – Present
Postdoctoral Scholar; Advisors: Dr. Hahui Lu and Dr. Sema Kurtulus

- Primary Project: CRISPR-mediated identification of T cell-intrinsic regulators of therapeutic responses to bispecific antibody-mediated activation
- Research Topics: T Cell Biology, Metabolic Signaling, T Cell Expansion/Engineering, Adoptive Transfer, Antitumor Therapy, Biologics Development, Immunomodulation

Project Details:

- Led a collaborative CRISPR/Cas9 screening project and identified novel T cell-intrinsic metabolic determinants of T cell cytotoxicity and memory in response to a novel therapeutic antibody
- Collaborated with CAR-T cell manufacturing teams and gained familiarity with CAR-T cell expansion protocols and determinants of optimal engineered T cell therapy outcomes
- Adoptively transferred expanded, genetically modified human T cells into mice bearing tumor xenografts in order to explore the *in vivo* efficacy of novel biologics

- Developed T cell, monocyte, macrophage, and dendritic cell assay systems to screen and assess immunomodulatory interactions among these cell subsets following antibody therapeutic treatment
- Contributed to three research projects culminating in one patent and one manuscript

Yale University 2012 – 2017

Graduate Researcher; Advisor: Dr. Akiko Iwasaki

- Dissertation: Aging-Dependent Alteration of Innate Antiviral Responses to Influenza in Human Monocytes
- Research Topics: Innate Immunity, Antiviral Immunity, Interferon Signaling, Human Aging, Metabolism, Microbiome

Project Details:

- Managed a research project requiring the collection of human blood from 148 donors for use in eight simultaneous targeted experiments to maximize sample utility and research output, culminating in national conference presentations and manuscript publications
- Created novel systems for the study the genetic and epigenetic basis of how aging affects innate immunity, interferon signaling, inflammation, cellular senescence, and influenza viral infection prognosis in primary human cells and mouse model systems
- Studied the metabolic effects of ketogenic diets on lung immune functionality in the context of bacterial and viral control *in vivo* using mice bearing a range of targeted mutations
- Initiated and facilitated five additional collaborations within and between laboratories and universities

University of Connecticut 2009 - 2012

Undergraduate & Graduate Researcher; Advisor: Dr. Michael Lynes

- Thesis: Surface Plasmon Enhanced Fluorescence-Based Transcription Factor Biosignatures of Metallothionein Gene Dose
- Research Topics: Transcription Factor Biochemistry, Assay Development, Surface Plasmon Resonance, Metalloregulatory Protein Dynamics

Project Details:

- Developed novel protein-based microarray technologies and screens to identify biomarker signatures of stress and disease in human patients, culminating in the publication of a first author publication
- One of 30 students awarded the highly competitive University Scholar award on the basis of outstanding academic achievement and a strong independent research project proposal

RESEARCH INTERESTS

Immuno-oncology, Biotherapeutics, Cell Therapy, Drug Development, Metabolism, Aging, Senescence, Autoimmunity, Antiviral Immunity, Innate Immunity, Infectious Diseases

INDUSTRY AND LEADERSHIP EXPERIENCE

President, Yale Biomedical Careers Committee 2015 – 2017

- Organized and secured over $60,000 in corporate sponsorships for an annual career fair with 20 panelists from 5 lines of biomedical work and over 350 student and postdoctoral attendees
- Managed and coordinated the activities of 15 committee members
- Organized seven career-oriented workshops for Yale students and postdoctoral researchers

Finalist, 2016 Merck KGaA Biopharma Innovation Cup July 2016

- One of 30 finalists from an international applicant pool of 800+ graduate students
- Met with industry leaders to learn and discuss innovative drug design strategies
- Collaborated in a five person team to design a business plan for implementation of a novel drug concept that met with Merck's strategic interests

TEACHING AND MENTORING EXPERIENCE

Student Mentor, Yale University 2014 – 2016

- Mentored two undergraduate students and one junior graduate student
- Taught both technical and conceptual skills to mentees, with a focus on providing them with the experimental and cognitive tools needed to conduct effective and innovative research
- Learned strategies for dealing with interpersonal differences and conflict resolution

Head Immunobiology Teaching Fellow, Yale University 2013 – 2014

- Served as the head teaching fellow for an introductory Immunobiology course attended by ~60 undergraduate and graduate students during two semesters
- Designed course materials, exams, and homework assignments to assess and guide student understanding of fundamental aspects of the immune system
- Independently developed and led weekly small group lectures and discussion sessions with 15 student groups to review specific immunological concepts in depth

PUBLICATIONS

- Chung, W., **Molony, R. D.**, Lee, Y. (2021). Non-stem bladder cancer cell-derived extracellular vesicles promote cancer stem cell survival in response to chemotherapy. *Stem Cell Research & Therapy. In submission.*
- Lu, H., **Molony, R. D.**, Chen, D., … Meyer, M. J. (2020). Development of anti-CD32b antibodies with enhanced Fc function for the treatment of B and plasma cell malignancies. *Molecular Cancer Therapeutics. 19*(10), 2089-2104

- Goldberg, E. L., **Molony, R. D**., Kudo, E., Sidorov, S., Kong, Y., Dixit, V. D., & Iwasaki, A. (2019). Ketogenic diet activates protective γδ T cell responses against influenza virus infection. *Science Immunology*, 4(41).
- **Molony, R. D**., Nguyen, J. T., Kong, Y., Montgomery, R. R., Shaw, A. C., & Iwasaki, A. (2017). Aging impairs both primary and secondary RIG-I signaling for interferon induction in human monocytes. Sci. Signal., 10(509).
- **Molony, R. D.,** Malawista, A., & Montgomery, R. R. (2017). Reduced dynamic range of antiviral innate immune responses in aging. Experimental gerontology.
- Fink, S. L., Jayewickreme, T. R., **Molony, R. D**., Iwawaki, T., Landis, C. S., Lindenbach, B. D., & Iwasaki, A. (2017). IRE1α promotes viral infection by conferring resistance to apoptosis. Sci. Signal., 10(482).
- Goldberg, E. L., Asher, J. L., **Molony, R. D**., Shaw, A. C., Zeiss, C. J., Wang, C., . . . Dixit, V. D. (2017). β-Hydroxybutyrate Deactivates Neutrophil NLRP3 Inflammasome to Relieve Gout Flares. Cell Reports, 18(9), 2077-2087.
- Iwasaki, A., Foxman, E. F., & **Molony, R. D**. (2017). Early local immune defences in the respiratory tract. Nature Reviews Immunology, 17(1), 7-20.
- Pillai, P. S., **Molony, R. D**., Martinod, K., Dong, H., Pang, I. K., Tal, M. C., ... & Homer, R. J. (2016). Mx1 reveals innate pathways to antiviral resistance and lethal influenza disease. Science, 352(6284), 463-466.
- **Molony, R. D**., Rice, J. M., Yuk, J. S., Shetty, V., Dey, D., Lawrence, D. A., & Lynes, M. A. (2012). Mining the Salivary Proteome with Grating-Coupled Surface Plasmon Resonance Imaging and Surface Plasmon Coupled Emission Microarrays. Current protocols in toxicology, 18-16.

PROFESSIONAL PRESENTATIONS

Invited Talks

- **Molony, R. D**. Cigarette Smoke and E-liquid Exposure Drive the Stress-Induced Production of Pro-Oncogenic Extracellular Vesicles by Bladder Cancer Cells. (September 2021). *AUA 2021 Annual Meeting.* Las Vegas, NV.
- **Molony, R. D**. CD8+ T cells require CD4+ T cell help to achieve sustained in vitro target tumor cell killing mediated by a CD3-engaging bispecific antibody. (February 2020). *Keystone Conference – Antibodies as Drugs: From B Cell Biology to New Treatments.* Santa Fe, NM.
- **Molony, R. D**. Targeted blockade of FcγRIIB on dendritic cells and macrophages enhances cellular activation and Fc-dependent immune responses. (November 2018). *AACR Tumor Immunology and Immunotherapy.* Miami, FL.
- **Molony, R.D**. IRF8 Induction Disrupts the Type I Interferon Response to Influenza in Monocytes from Old Individuals. (April 2016). Human & Translational Immunology Retreat, Yale University, New Haven, CT.

- **Molony, R.D**. IRF8 Induction Disrupts the Type I Interferon Response to Influenza in Monocytes from Old Individuals. (December 2015). Robert Shope Student Lecturer, Training in Virology Symposium, Yale University, New Haven, CT.

Poster Presentations

- **Molony, R.D.**, Nguyen, J.T., Kong, Y., Montgomery, R.R., Shaw, A.C., Iwasaki, A. Impaired IRF8 Induction Disrupts the Type I Interferon Response to Influenza in Monocytes from Old Individuals. Keystone Symposia – Viral Immunity: Mechanisms and Consequences. Santa Fe, NM. February 2017.
- **Molony, R.D.**, Nguyen, J.T., Kong, Y., Montgomery, R.R., Shaw, A.C., Iwasaki, A. Impaired IRF8 Induction Disrupts the Type I Interferon Response to Influenza in Monocytes from Old Individuals. Human & Translational Immunology Retreat, Yale University. New Haven, CT. April 2016.
- **Molony, R.D.**, Tal M., Montgomery R.R., Iwasaki A. Aging-dependent Alteration of the Innate Immune Response to Influenza. Yale Immunobiology Departmental Retreat, New Haven, CT. October 2015.
- **Molony, R.D.**, Reinhold, P., Roy-O'Reilly, M., Lynes, M.A. Phenotypic Characterization of Mice with Targeted Disruptions of Transgenic Additions to the Metallothionein Gene Dose. Northeast Society of Toxicology Regional Meeting, Cambridge, MA. October 2011.

FELLOWSHIPS AND AWARDS

- Francis Trudeau Fellowship 2016 – 2017
- Honors Scholar 2007 – 2011
- University Scholar 2010 – 2011
- Dean's List, College of Liberal Arts & Sciences 2008 – 2011
- United Technologies Scholarship 2007 – 2011
- *Summa Cum Laude* 2011
- Applied Genetics & Technology Award 2011
- Life Science Honors Thesis Award 2011
- Paul L. Drotch Memorial Scholarship 2010
- Summer Undergraduate Research Award 2010

RESEARCH SKILLS

- **Experimental Methods**: Primary human cell isolation from whole blood, Human T cell expansion, CRISPR/Cas9 editing of primary cells, T cell expansion, Tumor modeling, Metabolic assays, Adoptive T cell transfer, Cell culture, Murine disease models, Murine tissue collection, *in vitro* cellular assays, qPCR, Western immunoblotting, Immunoprecipitation, ELISAs, Flow cytometry, siRNA transfection in primary cells, Lentiviral transduction of primary cells, RNA-sequencing, Bisulfite sequencing, Microscopy, *in vivo* and *in vitro* bacterial/viral infection

- **Data Analysis**: Microsoft Excel, GraphPad Prism, FlowJo, R

PROFESSIONAL MEMBERSHIPS

- New York Academy of Sciences 2015 – Present
- Phi Beta Kappa 2010 – Present

VOLUNTEER EXPERIENCE

- Odyssey of the Mind – Judge 2017
- New Haven Science Fair – Judge 2014 – 2015
- Alternative Spring Break – Hurricane Katrina Relief 2008, 2009, 2011
- ImagineNation Children's Museum – Volunteer Guide 2005-2006