

Lucy F. Yang

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3720 15th Ave NE Seattle, WA 98195

EDUCATION

University of Washington (UW)

Doctor of Philosophy candidate, Department of Bioengineering
Advisor: Dr. Suzie H. Pun

09/2018 – expected 01/2023
Seattle, WA

Massachusetts Institute of Technology (MIT)

Bachelor of Science, Biological Engineering

06/2017
Cambridge, MA

RESEARCH

Department of Bioengineering, UW

Suzie H. Pun Lab
Ph.D. Candidate

09/2018 – present
Seattle, WA

- Discovering and characterizing DNA aptamers that bind SARS-CoV-2 spike protein, then applying to therapeutic and diagnostic applications, such as sensitive detection of inactivated SARS-CoV-2 virus
- Led to two patents, NIH funding, and a first-author publication under review at *Angewandte Chemie*
- Screening EMT-inhibiting drugs and designing polymer-drug conjugates to target kidney epithelial cells as a therapeutic for end stage renal disease
- Developed polymeric gene delivery vehicle targeting neural progenitor cells in traumatic brain injury

Koch Institute for Integrative Cancer Research, MIT

Scott R. Manalis Lab
Research Technician

09/2017 – 08/2018
Cambridge, MA

- Performed single-cell analysis of cell biophysical properties for measuring mitotic growth in multiple cell lines and effect of drug inhibition on cell growth, leading to a co-authored publication in *eLife*
- Built a microfluidic platform for sorting cells by morphology and incubating for organoid outgrowth studies
- Measured effect of drug treatments on cancer cell mass accumulation rate using a serial suspended microchannel resonator

Center for iPS Cell Research and Application, Kyoto University

Akitsu Hotta Lab
Visiting Researcher

06 – 08/2017
Kyoto, Japan

- Developed extracellular nanovesicle-based ribonucleoprotein CRISPR-Cas9 delivery platform system for exon skipping in Duchenne muscular dystrophy (DMD) patient induced pluripotent stem cells (iPSC)
- Assessed cleavage efficiency of variants such as multiplexed sgRNA, fluorophore-conjugated SpCas9
- Primarily independent work that culminated in a presentation to all scientists at the CiRA Institute, a co-authored publication in *Nat. Comm.*, and a 3-year grant worth \$600,000 from Japan's AMED

Koch Institute for Integrative Cancer Research, MIT

Scott R. Manalis Lab
Undergraduate Researcher

07/2015 – 06/2017
Cambridge, MA

- Extracted mouse circulating tumor cells (CTCs) through a microfluidic cell sorter to study CTC dynamics
- Optimized single-cell sorter device and protocol to reduce contamination and increase RNAseq quality
- Performed longitudinal animal studies to study CTC kinetics and effect of drug on gene expression
- Led to co-author publication in *PNAS*

Med-X Research Institute, Shanghai Jiao Tong University

Weiliang Xia Lab
Visiting Undergraduate Researcher

06 – 08/2015
Shanghai, China

- Led project on engineering copolymer PEI-PEG-KALA to deliver shRNA to lung carcinoma cells, resulting in presentation to research group and project hand-off to incoming graduate student

Koch Institute for Integrative Cancer Research, MIT

KD Wittrup Lab
Undergraduate Researcher

06/2014 – 05/2015
Cambridge, MA

- Engineered the viral protein p19 as a delivery vehicle for therapeutic siRNA to tumors, leading to co-authorship in a publication in *Nucleic Acids Research*
- Designed yeast surface display studies and plasmid construction

PUBLICATIONS

NK Kacherovsky*, **LF Yang***, HV Dang*, EL Cheng, II Cardle, AC Walls, M McCallum, DL Sellers, F DiMaio, SJ Salipante, D Corti, D Veessler, SH Pun. Discovery and characterization of spike N-terminal domain-binding aptamers for rapid SARS-CoV-2 detection, *Angewandte Chemie* (2021). * indicates authors contributed equally to this work

M Sylvestre, L Shixian, **LF Yang**, N Leura, DJ Peeler, BM Chen, S Roffler, SH Pun. Replacement of L-amino acid peptides with D-amino acid peptides mitigates anti-PEG antibody generation against polymer-peptide conjugates in mice, *Journal of Controlled Release* (2021): 331, 142-153.

L Shixian, M Sylvestre, AN Prossnitz, **LF Yang**, SH Pun. Design of polymeric carriers for intracellular peptide delivery in oncology applications, *Chemical Reviews* (2021).

M Nieves Calvo-Vidal, N Zamponi, J Krumsiek, MA Stockslager, MV Revuelta, JM Phillip, R Marullo, E Tikhonova, N Kotlov, J Patel, SN Yang, **L Yang**, T Taldone, C Thieblemont, J Leonard, P Martin, G Inghirami, G Chiosis, SR Manalis L Cerchietti. Oncogenic HSP90 facilitates metabolic alterations in aggressive B-cell lymphomas, *Cancer Research* (2021).

P Gee, N Sasakawa, T Iguchi, Y Makita, H Hozumi, **LF Yang**, M Lung, M Iwasaki, X Wang, M Waller, N Shirai, Y Abe, Y Fujita, K Watanabe, A Kagita, Y Okuzaki, H Xu, K Iwabuchi, T Noda, J Komano, N Inukai, A Hotta. Extracellular nanovesicles for packaging of CRISPR-Cas9 protein and sgRNA to induce therapeutic exon skipping, *Nature Communications* (2020): 1-18.

TP Miettinen, JH Kang, **LF Yang**, SR Manalis. Mammalian cell growth dynamics in mitosis. *eLife* (2019): e44700.

B Hamza, SR Ng, SM Prakadan, FF Delgado, CR Chin, EM King, **LF Yang**, SM Davidson, KL DeGouveia, N Cermak, AW Navia, PS Winter, T Tammela, CM Li, T Papagiannakopoulos, AJ Gupta, JS Bagnall, SM Knudsen, MG Vander Heiden, SC Wasserman, T Jacks, AK Shalek, SR Manalis. An Optofluidic Real-Time Cell Sorter for Longitudinal CTC Studies in Mouse Models of Cancer, *Proceedings of the National Academy of Sciences* (2019): 201814102.

NJ Yang, MJ Kauke, F Sun, **LF Yang**, KF Maass, MW Traxlmayr, Y Yu, Y Xu, RS Langer, DG Anderson, KD Wittrup. Cytosolic delivery of siRNA by ultra-high affinity dsRNA binding proteins, *Nucleic Acids Res* (2017): 45,7602-7614.

COMMUNITY

Research Mentor Mentor for undergraduate student performing research	05/2021 – present
Judge & Tournament Organizer Pokémon volunteer program for competitive video game and card game events	10/2013 – present
Owner & Designer Handmade crafts business	06/2016 – present
Teaching Assistant Advanced Molecular Engineering	09/2020 – 12/2020
Volunteer Laboratory Technician (for COVID-19 samples) UW Medical Center Specimen Processing Services; UW Virology	03/2020 – 06/2020
Volunteer Teacher (Biology, Design) MIT Splash, MIT High School Summer Program (HSSP)	10/2017, 06 – 08/2018
Founder, President, Tournament Organizer MIT Pokémon League	04/2014 – 09/2018
Biology Tutor MIT Department of Biology	09/2014 – 05/2015

PATENTS & AWARDS

Short Talk Oligonucleotide Therapeutics Society Conference	2021
Co-inventor U.S. Provisional Patents for Spike Protein Binding Aptamers	2021
Co-inventor U.S. Provisional Patent 63/211,907 Truncated Aptamer Systems and Methods of Use	2021
Honorable Mention National Science Foundation Graduate Research Fellowships Program	2017, 2019
Excellence in Poster Display MIT Biological Engineering Symposium	2016
Paul E. Gray UROP Researcher MIT Undergraduate Research Opportunities Program	2016