

Amy Si-Ying Lee, Ph.D.

Assistant Professor
Dana-Farber Cancer Institute
Harvard Medical School

450 Brookline Ave, SM520A, Boston, MA 02215
617.632.4105 • amysy_lee@dfci.harvard.edu
<http://leelab.hms.harvard.edu>

Education

2007–2012 **Harvard University**, Ph.D. in the Division of Medical Sciences, Program of Virology
Thesis: Ribosome-mediated specificity in vesicular stomatitis virus mRNA translation defines a new role for rpl40 during initiation

2002–2006 **Massachusetts Institute of Technology**, Bachelor of Science in Biology
Senior research: The role of urease in the pathogenesis of *Helicobacter hepaticus*

Positions

2021– **Assistant Professor**
Dana-Farber Cancer Institute, Immunology & Virology
Harvard Medical School, Department of Cell Biology

2016–2020 **Assistant Professor**
Brandeis University, Department of Biology

2012–2016 **Postdoctoral researcher, University of California, Berkeley**
2007–2012 **Graduate Student, Harvard University**

Honors and Awards

2022 Kavli Frontiers of Science Fellow, National Academy of Sciences
2021 V Scholar, V Foundation
2018 Pew Biomedical Scholar, The Pew Charitable Trusts
2017 Rita Allen Foundation Scholar, with Milton E. Cassel distinction
Top award distinction for awardees, declined to accept the Searle Scholar award
2017 Searle Scholar, Searle Scholars Program
2017 Sloan Research Fellowship, Alfred P. Sloan Foundation
2017 Charles H. Hood Foundation Child Health Research Awards Program Fellow
2014 American Cancer Society Postdoctoral Fellowship
2014 FASEB Machines on Genes Conference Junior Trainee Award
2012 American Society of Virology Conference Travel Grant
2011 ASM Conference on Viral Genome Replication Conference Travel Grant
2009 National Science Foundation Graduate Research Fellowship
2009 Department of Defense Graduate Research Fellowship
2008 MERCK Ph.D. Fellowship
2008 National Science Foundation Graduate Research Honorable Mention

Publications

1. Richmond-Buccola D, Hobbs SJ, Garcia JM, Toyoda H, Gao J, Shao S, **Lee ASY**, Kranzusch PJ. Convergent mutations in phage virion assembly proteins enable evasion of Type I CBASS immunity. *bioRxiv*. May 22:2023.05.21.541620.
2. Farache D, Antine SP, **Lee ASY**. "Moonlighting translation factors: multifunctionality drives diverse gene regulation." *Trends in Cell Biology*. 2022. 32(9), 762-772.
3. Farache D, Liu L, **Lee ASY**. "Eukaryotic initiation factor 5A2 regulates expression of antiviral genes." *Journal of Molecular Biology*. 2022. 434(10): 167564.
4. Missios P, da Rocha EL, Pearson DS, Philipp J, Aleman MM, Pirouz M, Farache D, Franses JW, Kubaczka C, Tsanov KM, Jha DK, Pepe-Mooney B, Powers JT, Gregory RI, **Lee ASY**, Dominguez D, Ting DT, Daley GQ. "LIN28B alters ribosomal dynamics to promote metastasis in MYCN-driven malignancy." *Journal of Clinical Investigation*. 2021. 131(22): e145142.

5. Slavik KM, Morehouse BR, Ragucci AE, Zhou W, Ai X, Chen Y, Li L, Wei Z, Bähre H, König M, Seifert R, **Lee ASY**, Cai H, Imler J, Kranzusch PJ. "cGAS-like receptors control RNA sensing and 3'-5' cGAMP antiviral signaling in Drosophila." *Nature*. 2021. 597(7874), 109-113.
6. Lamper AM*, Fleming RH*, Ladd KM*, **Lee ASY**. "A phosphorylation-dependent eIF3d translation switch mediates cellular adaptation to metabolic stress." *Science*. 2020 Nov 13; 370(6518): 853-856. (*co-first).
7. Lowey B, Whiteley AT, Keszei AFA, Morehouse BR, Antine SP, Cabrera VJ, Kashin D, Schwede F, Mekalanos JJ, Shao S, **Lee ASY**, Kranzusch PJ. "Bacterial SAVED/CARF-family effectors respond to 3'-5' and 2'-5'-linked nucleotide signals in CBASS antiviral immunity." *Cell*. 2020 July 9; 182(1): 38-49.
8. Weir K, Dupre C, van Giesen L, **Lee ASY**, Bellono NW. "A molecular filter for the cnidarian stinging response." *eLIFE*. 2020 May 26; eLife 2020;9:e57578.
9. Blower TR*, Bandak A*, **Lee ASY**, Austin CA, Nitiss JL, Berger JM. "A complex suite of loci and elements in eukaryotic type II topoisomerases determine selective sensitivity to distinct poisoning agents." *Nucleic Acids Research*. 2019 Sept 05; 47(15): 8163-8179. (*co-first)
10. Pulos-Holmes MC, Srole DN, Juarez MG, **Lee ASY**, McSwiggen DT, Ingolia NT, Cate JH. "Repression of ferritin light chain translation by human eIF3." *eLIFE*. 2019 Aug 15; eLife 2019;8:e48193.
11. de Oliveira Mann CC, Orzalli MH, King DS, Kagan JC, **Lee ASY***, Kranzusch PJ*. (***co-corresponding**) "Modular Architecture of the STING C-Terminal Tail Allows Interferon and NF- κ B Signaling Adaptation." *Cell Reports*. 2019 April 23; 201927, 1-11.
12. Whiteley AT, Eaglesham JB, de Oliveira Mann CC, Morehouse BR, Nieminen EA, King DS, **Lee ASY**, Mekalanos JJ, Kranzusch PJ. "Bacterial cGAS-like enzymes synthesize diverse nucleotide second messengers." *Nature*. 2019 Mar 14; 567(7747): 194-199.
13. **Lee ASY**, Kranzusch PJ, Doudna JA, Cate JH. "eIF3d is an mRNA cap-binding protein required for specialized translation initiation." *Nature*. 2016 Aug 04; 536:96-99.
14. Kranzusch PJ*, Wilson SC*, **Lee ASY**, Berger JM, Doudna JA, Vance RE. "Ancient Origin of cGAS-STING reveals mechanism of universal 2', 3' cGAMP signaling." *Molecular Cell*. 2015 Sept 17; 59(6): 891-903. (*co-first)
15. **Lee ASY**, Kranzusch PJ, Cate JH. "eIF3 targets cell proliferation mRNAs for translational activation or repression." *Nature*. 2015 Jun 04; 522:111-114.
16. Nuñez JK, **Lee ASY**, Engelman A, Doudna JA. "Integrase-mediated spacer acquisition during CRISPR- Cas adaptive immunity." *Nature*. 2015 Mar 12; 519:193-198.
17. Kranzusch PJ, **Lee ASY**, Wilson SC, Solovykh MS, Vance RE, Berger JM, Doudna JA. "Structure-Guided Reprogramming of Human cGAS Dinucleotide Linkage Specificity." *Cell*. 2014 Aug 28; 158(5):1011-1021.
18. **Lee ASY**, Burdeinick-Kerr R, Whelan S.P. "Host factors required for vesicular stomatitis virus infection." *Journal of Virology*. 2014 Aug 1; 88(15): 8355-8360.
19. Kranzusch PJ, **Lee ASY**, Berger JM, Doudna JA. "Structure of human cGAS reveals a conserved family of second-messenger enzymes in innate immunity." *Cell Reports*. 2013 May 23; 3(5): 1362-1368.
20. **Lee ASY**, Burdeinick-Kerr R, Whelan S.P. "A ribosome-specialized translation initiation pathway is required for cap-dependent translation of vesicular stomatitis virus mRNAs." *Proc Natl Acad Sci USA*. 2013 Jan 2; 110(1): 324-9.
21. Brulois K, Chang H, **Lee ASY**, Ensser A, Wong LY, Toth Z, Lee SH, Lee HR, Myoung J, Ganem DE, Oh TK, Kim JF, Gao SG, Jung JU. "Construction and manipulation of a new Kaposi's sarcoma-associated herpesvirus bacterial artificial chromosome clone." *Journal of Virology*. 2012 Sept; 86(18): 9708-9720.
22. Dixit E, Boulant S, Zhang Y, **Lee ASY**, Odendall C, Shum B, Hacohen N, Chen ZJ, Whelan SP, Fransen M, Nibert ML, Superti-Furga G, Kagan JC. "Peroxisomes are signaling platforms for antiviral innate immunity." *Cell*. 2010 May 14; 141(4):668-81.
23. Ge Z, **Lee A**, Whary MT, Rogers AB, Maurer KJ, Taylor NS, Schauer DB, Fox JG. "Helicobacter hepaticus urease is not required for intestinal colonization but promotes hepatic inflammation in male A/JCr mice." *Microbial Pathogenesis*. 2008 Jul; 45(1): 18-24.
24. Radioshitzky S, Kuhn J, Spiropoulos C, Albarino C, Nguyen D, Salazar-Bravo J, Dorfman T, **Lee AS**, Wang E, Ross S, Choe H, Farzan M. "Receptor Determinants of Zoonotic Transmission of New World Hemorrhagic Fever Arenaviruses" *Proc Natl Acad Sci USA*. 2008 Feb 19; 105(7):2664-9.
25. Ge Z, Rogers AB, Feng Y, **Lee A**, Xu S, Taylor NS, Fox JG. "Bacterial cytolethal distending toxin promotes the development of dysplasia in a model of microbially induced hepatocarcinogenesis" *Cell Microbiology*. 2007 Aug; 9(8): 2070-2080.

Patents

Whelan S, **Lee A**. "Compositions and methods for the treatment of viral infections" *WO Patent 2,013,082,237*, 2013.

Lab Members

2016 -

Research Supervisor

Post-doctoral Scholars: Fatima Alghoul (AACR Fellow), Max Fels (Branco Weiss and Moderna Fellow), Shaoni Mukhopadhyay (HGB Fellow), Hsin-Yu Tsai, Hyeongju Kim

Graduate Students: Richard Han (BBS), Jasmine Garcia (BBS, NSF and Ford Fellow), Anna Drabarek (Masters student, Bayer Fellow, TMU)

Technicians: Jing Guo, Jess Tran

Undergraduate Students: Jinrou Li (Peking University)

Alumni (current position):

Mikayla Cantone (*Undergrad, UMass Boston*), Ngan Phan (*PhD student, UC Berkeley*), Maria Amodeo (*PhD student, Harvard BBS*), Christina Liu (*Research Tech, DFCI*), Hunter Noyes, Luo Chen Liu (*PhD student, Harvard Virology*), Dorian Farache (*Scientist, Evotec*), Konstantin Fischer (*Masters student, RKU Heidelberg*), Becca Fleming (*Scientist, Sanofi*), Kate Segar (*PhD student, University of Colorado*), Sadie Antine (*PhD student, Harvard Virology*), Monifa Fahie (*Postdoc, Kardon lab*), Hsiao-Yun Chen (*Senior scientist, New Equilibrium Biosciences*), Kayla Ladd (*PhD student, University of Oregon*), Adrian Ashley (*JD student, BU*), Adam Lamper (*PhD student, Columbia University*), Maia Reyes (*PhD student, UC Berkeley*), Annie Huang (*PhD student, UW-Madison*), Samuel Hildebrand (*PhD student, UMass Medical*), Bradley Bousquet (*DMD student, Harvard SDM*)