

AUDREY E. OLSHEFSKY

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EDUCATION

University of Washington **Seattle, WA**
PhD Candidate, Department of Bioengineering Expected 2023

Massachusetts Institute of Technology **Cambridge, MA**
Bachelor of Science in Biological Engineering June 2016

Friday Harbor High School **Friday Harbor, WA**
Valedictorian June 2012

RESEARCH EXPERIENCE

University of Washington **Seattle, WA**
Graduate Research Assistant, Department of Bioengineering September 2017 – Present

- Co-advised by Dr. Suzie H. Pun and Dr. Neil P. King.
- Developing a platform for *in vivo* miniprotein library display on synthetic nucleocapsids.
- Modularly re-targeting protein nanoparticles to tumors by displaying known cancer binders on the nanoparticle surface.

Juno Therapeutics **Seattle, WA**
Research Associate, Gene Engineering & Delivery, 1-year contract July 2016 – August 2017

- Designed and constructed chimeric antigen receptor (CAR) T cell plasmids for cancer therapeutic research.
- Optimized and performed an assay that analyzes RNA splicing in primary cells.
- Evaluated several protein tags to detect CARs via flow cytometry.

Massachusetts Institute of Technology **Cambridge, MA**
Undergraduate Researcher, Department of Biological Engineering January 2015 – 2016

- Under the mentorship of Dr. Natalie Kuldell, optimized a synthetic pathway in *E. coli* to produce high-contrast bacterial photographs.

Fred Hutchinson Cancer Research Center **Seattle, WA**
Undergraduate Intern June – August 2015

- Under the mentorship of Dr. Carissa Perez Olsen, designed a targeted RNA interference screen with *C. elegans* to map the genetic regulation of plasmalogens.

Parsons Laboratory for Environmental Science and Engineering **Cambridge, MA**
Undergraduate Researcher January 2013 – May 2015

- Under the mentorship of Dr. Sallie (Penny) Chisholm and Dr. Andres Cubillos-Ruiz at MIT, examined nitrogen assimilation from amino acids in *Prochlorococcus* and *Rhizobium* co-cultures and integrated the results with known metabolic pathways.
- Supported the ongoing development of a genetic system for *Prochlorococcus* by constructing plasmids and carrying out bacterial conjugation experiments.

University of Washington Friday Harbor Laboratories **Friday Harbor, WA**
Research Assistant June - August 2011

- Under the mentorship of the Dr. Kenneth Sebens Lab and Tim Dwyer, studied long-term marine community ecology in Nahant, MA and the San Juan Islands, WA.
- Tracked changes in distribution and abundance of sea urchins by underwater image analysis, comparing current images to images over the prior 3 decades.
- Studied predator impacts on underwater rock walls by analyzing scraped samples.
- Drove research watercraft and served as surface support for scientific diving operations.

PUBLICATIONS

Lv S, Song K, Yen A, Peller DJ, Nguyen DC, **Olshefsky A** et al. Well-Defined Mannosylated Polymer for Peptide Vaccine Delivery with Enhanced Antitumor Immunity. *Adv. Healthcare Materials*. 11(9):2101651.

Olshefsky A, Richardson C, Pun SH, King NP (2022). Engineering self-assembling protein nanoparticles for therapeutic delivery. *Bioconj. Chem.* 33(11):2018-2034.

Ellis D, Lederhofer J, Acton OJ, Tsybovsky Y, Kephart S, Yap C, Gillespie RA, Creanga A, **Olshefsky A** et al (2022). Structure-based design of stabilized recombinant influenza neuraminidase tetramers. *Nature Comm.* 13(1):1825.

Olshefsky A, King NP (2021). Hallmarks of icosahedral virus capsids emerged during laboratory evolution of a bacterial enzyme. *Trends Biochem. Sci.* S0968-0004(21):00168-7.

Lajoie MJ*, Boyken SE*, Salter AI*, Bruffey J, Rajan A, Langan RA, **Olshefsky A**, et al (2020). Designed protein logic to target cells with precise combinations of surface antigens. *Science*, 369(6511):1637-43.

Gustafson HH, **Olshefsky A**, Sellers DL, Sylvestre M, Pun SH (2018). Current state of *in vivo* panning technologies: designing specificity and affinity into the future of drug targeting. *ADDR*, 130:39-49.

Olshefsky A*, Shehata L*, Kuldell N (2016). Site-Directed Mutagenesis to Improve Sensitivity of a Synthetic Two-Component Signaling System. *PLoS ONE* 11(1): e0147494.

*Co-first authors.

PRESENTATIONS

Olshefsky A, et al. Modular reprogramming of designed protein nanoparticles to selectively target solid tumors. Gordon Research Conference, Drug Carriers in Medicine and Biology, Mount Snow, VT, 2022. (Poster)

Olshefsky A, et al. *In vivo* library selection of synthetic nucleocapsids with applications in cancer therapeutic delivery. Deep Mutational Scanning Symposium, Seattle, WA, 2020. (Poster)

Olshefsky A, et al. Design and library selection of synthetic nucleocapsids for targeted therapeutic delivery. Biomedical Engineering Society Research Conference, Philadelphia, PA, 2019. (Poster)

Olshefsky A, et al. Library selection of synthetic nucleocapsids to evolve *in vivo* targeting. RosettaCon, Leavenworth, WA, 2018. (Poster)

Olshefsky A, Butterfield GL, Lajoie MJ, Gustafson HH, Sellers DL, Roy A, Sylvestre M, Cherf GM, Cochran JR, Pun SH, Baker D, King NP. Self-assembling protein nanocages as a vehicle for targeted therapeutic delivery. Cystic Fibrosis Foundation Summer Conference, Jackson, WY, 2018. (Talk)

Olshefsky A, Drechsler R, Chen SW, Perez Olsen C. Targeted RNA interference screen to map the genetic network of plasmalogens in *C. elegans*. Fred Hutch Summer Undergraduate Research Symposium, Seattle, WA, 2015. (Poster)

AWARDS & HONORS

Best Technology, awarded by Deep Mutational Scanning Symposium 2020

Interdisciplinary Training in Cancer Research, NIH training grant 2018-2020

Inskeep Legacy Scholar, awarded by San Juan Island Community Foundation 2012-2016

Bishop-Fleet Foundation Scholar, awarded by Bishop-Fleet Foundation 2012

Valedictorian, Friday Harbor High School 2011

Young Investigator Prize, awarded by UW Friday Harbor Laboratories 2010

Global Leaders Scholar, awarded by AFS-USA for foreign exchange in Argentina 2009

LEADERSHIP & OUTREACH

Pre-College Rosetta Internship Opportunity July 2020 – 2021
Founder and Mentor

- Program materials: <https://kumu.io/awvater/pre-college-rosetta-internship-opportunity-workflow-and-resource-hub#wheel-map>

UW Making Connections September 2017 – 2021
Academic and Career Mentor