

Meilyn Sylvestre

mrsi69@uw.edu | 3720 15th Ave NE, Seattle WA 98195 | www.linkedin.com/in/meilyn-sylvestre-2021

EDUCATION

University of Washington (UW), Seattle, WA
Ph.D., Department of Bioengineering

July 2021

Case Western Reserve University (CWRU), Cleveland, OH
B.S. Biomedical Engineering, Polymer Engineering minor (*Cum Laude*)

May 2016

RESEARCH EXPERIENCES

Ph.D. Candidate, Bioengineering, UW

Jan 2017 – Aug 2021

Advisor: Dr. Suzie H. Pun

Thesis: "Engineering pH-responsive biomaterials for cancer immunotherapies"

- Identified a DNA aptamer targeting ligand (cell-SELEX, NGS) specific for human monocytes and characterized binding behavior *in vitro* and *in vivo*
 - Patent application filed
- Designed polymeric drug carriers to cross the blood-brain barrier and developed assays to assess transport, efficacy *in vitro* (transwell) and *in vivo* (brain accumulation, brain tumor reduction)
 - Awarded DOD Horizon Award for glioblastoma research (\$150,000)
- Characterized immune response against polymer-peptide conjugates and designed alternative peptide cargo to improve safety and dosing of PEGylated drug carriers
 - Patent application filed
- Evaluated ability of polymer-peptide conjugates to induce immunogenic cell death *in vitro* and assessed efficacy (tumor reduction, tumor-infiltrating leukocyte activation) *in vivo*

Research Assistant, Department of Biomedical Engineering, CWRU

Sept 2013 – May 2016

Advisor: Dr. Efstathios Karathanasis

- Evaluated *in vivo* efficacy, biodistribution of dual-ligand dual-drug liposomes to deliver chemotherapeutics to metastatic breast cancer

WORK EXPERIENCES

Senior Design Researcher, CWRU

Aug 2015 – May 2016

Advisor: Dr. Colin Drummond, Biomedical Engineering

- Designed, manufactured, and validated a cooling vest for pregnant women using various polymer combinations, working with an interdisciplinary team of polymer and biomedical engineers

Reliability Engineer, Philips Healthcare

Jan – Aug 2015

- Tracked system performance and identified failure modes for CT/AMI scanner and executed Computer System Validation of biomedical device software systems for FDA review and approval
- Developed automated call categorization system using regular expression coding to reduce weekly employee labor from > 50 hours to < 2 hours

LABORATORY SKILLS

In vitro:

- Cell culture (primary murine, human)
- Multi-color flow cytometry & FlowJo analysis
- ELISA/bioluminescent/colorimetric assays
- Fluorescent microscopy (confocal)
- Immune cell characterization *in vitro*, *ex vivo* (tumor infiltrating leukocyte isolation)
- PCR (qPCR, droplet digital PCR) and Next Generation Sequencing & analysis

In vivo:

- Injections (IP, ROI, tail vein), sample collection
- Tumor inoculation, efficacy & survival studies
- Live-animal imaging
- IACUC protocol writing, management

PUBLICATIONS

*equally contributing authors

1. *Lv, S., ***Sylvestre, M.**, and Pun, S.H. (2021), Development of D-melittin polymeric nanoparticles for anti-cancer treatment. *Biomaterials*, accepted.
2. ***Sylvestre, M.**, *Lv, S., Yang, L.F., Luera, N., Peeler, D.J., Chen, B-M., Roffler, S., and Pun, S.H. (2021), 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*, 331: 142-153. DOI: [10.1016/j.jconrel.2021.01.015](https://doi.org/10.1016/j.jconrel.2021.01.015)
3. Lv, S., **Sylvestre, M.**, Prossnitz, A., Yang, L.F., and Pun, S.H. (2021), Design of polymeric carriers for intracellular peptide delivery in oncology applications. *Chemical Reviews*. DOI: [10.1021/acs.chemrev.0c00963](https://doi.org/10.1021/acs.chemrev.0c00963)
4. **Sylvestre, M.**, Saxby, C., Kacherovsky, N., Gustafson, H.H., Salipante, S., and Pun, S.H. (2020), Identification of a DNA aptamer that binds to human monocytes and macrophages. *Bioconjugate Chemistry*, 31(8): 1899-1907. DOI: [10.1021/acs.bioconjchem.0c00247](https://doi.org/10.1021/acs.bioconjchem.0c00247)
5. **Sylvestre, M.**, Crane, C., and Pun, S.H. (2020), Progress on Modulating Tumor-Associated Macrophage with Biomaterials. *Advanced Materials*, 1902007. DOI: [10.1002/adma.201902007](https://doi.org/10.1002/adma.201902007)
6. Gustafson, H.H., Olshefsky, A., **Sylvestre, M.**, Pun, S.H. (2018), Current state of in-vivo panning technologies: designing specificity and affinity into the future of drug targeting. *Advanced Drug Delivery Reviews*, 130: 39-49. DOI: [10.1016/j.addr.2018.06.015](https://doi.org/10.1016/j.addr.2018.06.015)
7. *Ngambenjwong, C., **Sylvestre, M.**, Gustafson, H.H., Pineda, J., and Pun, S.H. (2018), Reversibly switchable, pH-dependent peptide ligand binding via 3, 5-diiodotyrosine substitutions. *ACS Chemical Biology*, 13(4): 995-1002. DOI: [10.1021/acschembio.8b00171](https://doi.org/10.1021/acschembio.8b00171)
8. Yen, A., Cheng, Y., **Sylvestre, M.**, Gustafson, H.H., Puri, S., Pun, S.H. (2018), Serum Nuclease Susceptibility of mRNA Cargo in Condensed Polyplexes. *ACS Molecular Pharmaceutics*, 15(6): 2268-2276. DOI: [10.1021/acs.molpharmaceut.8b00134](https://doi.org/10.1021/acs.molpharmaceut.8b00134)
9. Ngambenjwong, C., Gustafson, H.H., **Sylvestre, M.** and Pun, S.H. (2017), A facile cyclization method improves peptide serum stability and confers intrinsic fluorescence. *ChemBioChem*, 18(24): 2395-2398. DOI: [10.1002/cbic.201700446](https://doi.org/10.1002/cbic.201700446)
10. Peiris, P.M., Deb, P., Doolittle, E., Doron, G., Goldberg, A., Govender, P., Shah, S., Rao, S., Carbone, S., Cotey, T., **Sylvestre, M.**, Singh, S., Schiemann, W.P., Lee, Z., and Karathanasis, E. (2015), Vascular Targeting of a Gold Nanoparticle to Breast Cancer Metastasis. *Journal of Pharmaceutical Sciences*, 104(8): 2600-2610. DOI: [10.1002/jps.24518](https://doi.org/10.1002/jps.24518)
11. Doolittle, E., Peiris, P.M., Doron, G., Goldberg, A., Tucci, S., Rao, S., Shah, S., **Sylvestre, M.**, Govender, P., Turan, O., Lee, Z., Schiemann, W., Karathanasis, E. (2015), Spatiotemporal Targeting of a Dual-Ligand Nanoparticle to Cancer Metastasis. *ACS Nano*, 9(8): 8012-8021. DOI: [10.1021/acs.nano.5b01552](https://doi.org/10.1021/acs.nano.5b01552)

PATENTS

1. Sylvestre, M., Pun, S.H., and Lyu, S. "D-melittin-derived peptides as cytotoxic agents." *Patent application filed*.
2. Sylvestre, M., Pun, S.H., Kacherovsky, N., Cheng, E., Cardle, I., and Saxby, C. "Monocyte and Macrophage Binding Aptamers and their Application." *Patent application filed*.

PRESENTATIONS

1. **Sylvestre, M.**, Saxby, C., Gustafson, H., Kacherovsky, N., Salipante, S., and Pun, S. (2018), Discovering human tumor-associated macrophage ligands using a cell-SELEX strategy. *International Nanomedicine & Drug Delivery Symposium*. (Poster, **Outstanding Poster Presentation Award**).
2. **Sylvestre, M.**, Saxby, C., Gustafson, H., Kacherovsky, N., Salipante, S., and Pun, S. (2018), Discovering human apTAMers: selecting for targeting ligands against tumor associated macrophages. *Bioengineering Department Retreat*. (Invited Talk).
3. Yen, A., **Sylvestre, M.**, Cheng, Y., Gustafson, H., Puri, S., and Pun, S. (2017), In vitro and in vivo mRNA delivery using cationic polymers. *Nanomedicine and Drug Delivery Symposium*. (Poster).

TEACHING EXPERIENCE

Graduate Student Mentor to Undergraduate Volunteer, UW

Sept 2019-July 2021

Introduction to Bioengineering Problem Solving, UW

Sept – Dec 2018

- Bioengineering Department Award for Excellence in Teaching

Biophysics-Physiology I & II, CWRU

Aug 2015 – May 2016

Introduction to Programming, CWRU

Aug – Dec 2014

Introduction to Engineering, CWRU

Jan – May 2014

LEADERSHIP EXPERIENCE

Student Advisory Board Graduate Student Lead, Bioengineering Department, UW	Sept 2016 – July 2021
Graduate Student Representative, Bioengineering Department, UW	Oct 2016 – Apr 2018
Leadership Nominating Committee, Pi Beta Phi Women's Fraternity, CWRU	Jan 2014 – Jan 2016
Academic Dispensation Committee, Gamma Sigma Alpha, CWRU	March 2015 – May 2016
News Layout Editor, The Observer, CWRU	Aug 2012 – Dec 2013

EDUCATIONAL EXPERIENCES

Making Connections Program, UW	Feb 2020-Feb 2021
Women in Science & Engineering (WiSE) 29 th Annual Conference Presentation, UW	Feb 2020
Career Planning & Leadership Program, UW	Oct 2017 – June 2018
Advertising Board, Case Engineers Council, CWRU	Dec 2012 – Dec 2015

HONORS AND AWARDS

2021	Baxter Young Investigator Award
2020	DOD Peer Reviewed Cancer Research Program Horizon Award (\$150,000)
2019	Bioengineering Department Award for Excellence in Teaching
2018	Outstanding Poster Presentation Award, Nanomedicine & Drug Delivery Symposium
2017	NSF Graduate Research Program Fellowship Honorary Mention
2016	Cum Laude Honors
2015	Reliability Engineering Department Employee of the Month, Philips Healthcare
2013	National Society of Collegiate Scholars
2012 – 2016	Dean's Honors
2012 – 2016	University Scholarship, CWRU (\$160,000)