

Clinton Heinze, PhD

Postdoctoral Researcher
Dept of Bioengineering, University of Washington

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EDUCATION

University of Washington

Doctor of Philosophy in bioengineering, August 2023.

NSF Graduate Research Fellow

PhD advisors: Prof. Suzie Pun & Dr. Michael Jensen

Dissertation: *Enhancing CAR T cell safety with new universal CAR systems and anatomically restricted tumor targeting*

University of Wisconsin - Madison

Bachelor of Science in Biomedical Engineering, 2018 – Graduated with distinction

Specialization: cell/tissue/biomaterial engineering

Cumulative GPA: 3.86 on a 4.0 scale, Biomedical Engineering GPA: 4.0 on a 4.0 scale

- Study Abroad program: Nanyang Technological University (NTU), Singapore (autumn 2016)

RESEARCH & DESIGN EXPERIENCE

Graduate Research Assistant (September 2018 – August 2023)

Department of Bioengineering, University of Washington, Seattle, WA

Seattle Children's Therapeutics, Seattle Children's Research Institute, Seattle, WA

Primary Investigators: Dr. Suzie Pun & Dr. Michael Jensen

- Designed and developed novel hapten-specific universal chimeric antigen receptors (CARs) - *patented*
- Developed a logic gated CAR T cell system to enhance cytolytic specificity using biomaterials and an inducible CAR platform – *provisional patent, paper under revision*
- Optimized small molecules and polymers to enhance *in vitro* and *in vivo* CAR T cell function

Undergraduate Research Assistant (June 2015 – July 2018)

Department of Human Oncology, University of Wisconsin School of Medicine and Public Health, Madison, WI

Primary Investigators: Dr. Zachary Morris & Dr. Paul Sondel

- Evaluated the existence and role of endogenous tumor-specific antibody responses induced by treatments
 - Lead role on project – *1st author abstract, published*
- Assessed the transcriptional upregulation time courses for various immune susceptibility markers induced by radiation therapy - *published*
- Investigated the impact of immune tolerance in metastatic murine models and the use of radiation therapy to counteract its impact on other cancer therapies – *published*
- Development of *in situ* vaccine techniques for cancer immunotherapy through *in vivo* and cell analysis experiments

Capstone Design: “Implantable Light Source for Driving Optogenetic Constructs,” (Jan. 2017 – May 2018)

Department of Biomedical Engineering, University of Wisconsin – Madison, Madison, WI

Advisor: Dr. Jeremy Rogers, Client: Dr. Jay Yang

Role (January 2017 – May 2017): Student representative for department curriculum/outreach committee.

Role (May 2017 – January 2018): Team Leader, project organizer

Role (January 2018 – May 2018): Communicator, project organizer

- Designed, fabricated, and tested a wirelessly controlled implantable device and its paired user interface to administer light stimulation to anion channelrhodopsin (ACR) in the sciatic nerve of experimental rats
- Designed and fabricated a biomaterial casing for the implanted device

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TEACHING EXPERIENCE

Tutor for the Greater University Tutoring Service, University of Wisconsin (September 2015 – May 2017)

- Topics taught: First- and second-year physics, statics, organic chemistry, calculus semesters 1-3, & statistics

Teaching Assistant, University of Washington (January 2023 – March 2023)

- Course taught: Immunoengineering

PUBLICATIONS/PATENTS

1. **Heinze, C. M.**, Pichon, T. J., Baldwin, M., Matthaei, J., Sylvestre, M., Gustafson, J., White, N., Jensen, M. C., Pun, S. H. (*submitted*). Intratumoral Activation of Fluorescein-Specific CAR T Cells Following Administration of a Synthetic Fibrin-homing Polymer.
2. Provisional patents covering next generation CAR T cell technology (2022, 2023).
3. Baniel, C. C., **Heinze, C. M.**, Hoefges, A., Sumiec, E. G., Hank, J. A., Carlson, P., Jin, W., Patel, R. B., Sriramaneni, R. N., Gillies, S. D., Korman, A. J., Erbe, A. K., Schwarz, C. N., Rakhmievich, A. L., Sondel, P. M., Morris, Z. S. (2020) Combination in situ vaccine plus checkpoint blockade induces memory humoral response. *Frontiers in Immunology*. <https://doi.org/10.3389/fimmu.2020.01610>
4. Clark, P. A., Sriramaneni, R. N., Jin, W. J., Jagodinsky, J. C., Bates, A. M., Jaquish, A. A., Anderson, B. R., Le, T., Lubin, J. A., Chakravarty, I., Arthur, I. S., **Heinze, C. M.**, Guy, E. I., Kler, J., Klar, K. A., Carlson, P. M., Kim, K. M., Kuo, J. S., & Morris, Z. S. (2020). In situ vaccination at a peripheral tumor site augments response against melanoma brain metastases. *Journal for immunotherapy of cancer*, 8(2), e000809. <https://doi.org/10.1136/jitc-2020-000809>
5. Morris, Z. S., Guy, E. I., Werner, L. R., Carlson, P. M., **Heinze, C. M.**, Kler, J. S., Busche, S. M., Jaquish, A. A., Sriramaneni, R. N., Carmichael, L. L., Loibner, H., Gillies, S. D., Korman, A. J., Erbe, A. K., Hank, J. A., Rakhmievich, A. L., Harari, P. M., & Sondel, P. M. (2018). Tumor-Specific Inhibition of *In Situ* Vaccination by Distant Untreated Tumor Sites. *Cancer immunology research*, 6(7), 825–834. <https://doi.org/10.1158/2326-6066.CIR-17-0353>
6. Werner, L. R., Kler, J. S., Gressett, M. M., Riegert, M., Werner, L. K., **Heinze, C. M.**, Kern, J. G., Abbariki, M., Erbe, A. K., Patel, R. B., Sriramaneni, R. N., Harari, P. M., & Morris, Z. S. (2017). Transcriptional-mediated effects of radiation on the expression of immune susceptibility markers in melanoma. *Radiotherapy and oncology: journal of the European Society for Therapeutic Radiology and Oncology*, 124(3), 418–426. <https://doi.org/10.1016/j.radonc.2017.08.016>

HONORS/AWARDS

- NSF GRFP – 2020-2023
- ARCS Foundation Fellowship – 2018-2021
- Dean's List (7 semesters) – 2014-2018
- Citizenship Award – 2014-2018
- UW-Madison Biomedical Engineering Design Excellence Award – 2018
- Witkay, Wendel James Scholarship – 2016
- UW College of Engineering Freshman Academic Achievement Award – 2015

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ORAL PRESENTATIONS, & POSTERS

1. **Heinze CM**, Baldwin M, Sellers DL, Horan M, Pun SH, Jensen MC. Universal tumor targeting with CAR T cells specific for conjugated biotin derivatives. Keystone Symposia C2, Poster Presentation. March 2023, Banff, BC.
2. **Heinze CM**, Baniel C, Carlson P, Hank JA, Sriramaneni RN, Guy EI, Kler J, Busche S, Gillies SD, Loibner H, Korman AJ, Rakhmievich AL, Sondel PM, Morris ZS. Combining *in situ* vaccination with checkpoint blockade enhances an endogenous anti-tumor B-cell response resulting in tumor-specific humoral memory. SITC 32nd Annual Meeting, Poster Presentation. Nov. 2017, National Harbor, MD.
 - Abstract featured: Bristol-Myers Squibb in their Best-of-Abstracts Highlights

LABORATORY SKILLS

- *Bench work*: Flow cytometry, Western blotting, gel electrophoresis, IHC, Bradford Assay, cell culture, lentivirus production and titrating, chromium release assays, cytokine release assays, intracellular cytokine staining, cloning, and nucleofection.
- *Mouse work*: mouse handling, facial vein bleeds, intraperitoneal, intra-tumor, retro-orbital, and subcutaneous injections, tumor measuring, shaving, tumor resection, organ harvests, cardiac punctures, perfusions, and tumor irradiation.
- *Imaging*: bright-field microscopy, immunofluorescence imaging, confocal microscopy, IVIS imaging, IncuCyte imaging
- *Software*: Matlab, SolidWorks, ImageJ, FlowJo, Prism, Microsoft Office Suite

VOLUNTEER ACTIVITIES/HOBBIES/EXTRACURRICULARS

Bryant Elementary School Science Mentor (January 2019 – March 2020)

- Leadership role: Experiment designer and 5th grade science mentor

Geneva Campus Church Youth Volunteer (December 2015 – May 2018)

- Leadership role: Mentor for high school students

UW-Madison Ultimate Frisbee & NTU Ultimate Frisbee (September 2015 – May 2017)

Volunteer Trip with MEDLIFE (2015)

- Two-week trip in Tanzania assisting local doctors and setting up pop-up medical clinics

Hobbies: Backpacking, skiing, biking, Ultimate Frisbee, paddle boarding, kayaking, running, photography & travel.