

# Victoria Gomerding

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## EDUCATION

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- Yale University** – GPA 3.93/4.0; *magna cum laude* New Haven, CT  
May 2020
- Bachelor of Science in Chemical Engineering, ABET accredited
- Massachusetts Institute of Technology** Cambridge, MA
- Incoming PhD student – Chemical Engineering
  - MIT UCEM Sloan Scholarship recipient

## RESEARCH EXPERIENCE

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**Undergraduate Research Assistant** February 2017 - May 2020  
*Dr. Mark Saltzman Lab, Yale University—Department of Biomedical Engineering (New Haven, CT)*

- Developed polymeric nanoparticles, polyplexes (complexes between nucleic acids and polymers), and thermo-reversible gels for targeted intracellular delivery of nucleic acids.
  - Prepared nanoparticles and polyplexes and formulated the thermo-reversible gels.
    - Analyzed particle size and surface charge using dynamic light scattering.
  - Delivered dye-loaded nanoparticles to HeLa cells and imaged the cells using fluorescent microscopy to evaluate the cellular uptake of the nanoparticles.
  - Delivered polyplexes containing GFP-expressing mRNA or plasmid DNA to HeLa cells and performed flow cytometry to characterize the expression of delivered nucleic acid.
  - Intravaginally delivered thermo-reversible poloxamer gels containing nanoparticles to mice and characterized uptake of the particles using fluorescent microscopy and IVIS (*in vivo* imaging system) to determine bio-compatibility and biodistribution.
- Systemically delivered (via retro-orbital injection) dye-loaded nanoparticles to mice and characterized biodistribution using IVIS.

**Undergraduate Research Assistant** Summer 2019  
*Dr. Brandon DeKosky Lab, University of Kansas—Department of Pharmaceutical Chemistry (Lawrence, KS)*

- Optimized a PCR-based site-directed mutagenesis method for rapidly and effectively mutating antibody sequences.
  - Designed mutagenic primers and introduced site-directed mutations into antibody encoding sequences of double-stranded plasmid vectors.
    - Introduced deletions of 120+ amino acids, insertions of 10+ amino acids, and substitutions of single amino acids.
  - Validated sequences of 13 of the site-directed mutations using Sanger sequencing

**Summer Scholar—Research Assistant**

Summer 2018

*Dr. Robb Krumlauf Lab, Stowers Institute for Medical Research (Kansas City, MO)*

- Visualized Hoxb1 protein localization throughout live mouse embryonic hindbrains over multiple hours using confocal microscopy to further understand the spatial and temporal changes in Hoxb1 protein localization and its role in hindbrain development.
  - Dissected the hindbrains of genetically modified mouse embryos expressing CRISPR-mediated fluorescently tag Hoxb1 protein.
  - Tested methods for preparing the hindbrain tissue samples to preserve the living tissue and improve image quality.
  - Imaged the hindbrains over extended periods of time using a confocal microscope.

**ACTIVITIES and LEADERSHIP EXPERIENCE**

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<b>Yale Precision Marching Band</b> – Clarinetist	2016 - 2020
<b>Volunteer at St. Thomas More Catholic Center at Yale University</b>	2016 - 2020
<b>Tau Beta Pi Engineering Honor Society—Yale University Chapter</b>	2018 –2020
<b>Tau Beta Pi Chapter President</b>	2019 – 2020
<ul style="list-style-type: none"> <li>• Planned and coordinated events with other student leaders, faculty advisors, School of Engineering, and TBP Headquarters.</li> <li>• Engaged chapter members and Yale community via social, networking, and professional events.</li> <li>• Completed reports required by TBP Headquarters and Yale University.</li> </ul>	

**SKILLS and LANGUAGES**

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**Computer:** Microsoft Office Suite, SolidWorks, Matlab, ImageJ**Lab equipment:** Confocal microscopy, fluorescence microscopy, nanodrop, plate reader, centrifuge, sonicator, flow cytometer, IVIS imaging system**Animal Care (mice):** Handle and restraint, administer IP injections, dissection, retro-orbital injection**Histology:** embed tissue samples, cryostat sectioning**Microbiology/Molecular biology:** PCR, agarose gel electrophoresis, use of restriction enzymes, *E.coli* transformation—heat shock and electroporation, DNA isolation from *E.coli* cells**Other relevant lab experience:** Mammalian cell culture, cloning, site-directed mutagenesis, primer design, Sanger sequencing, data and image analysis**Languages:** Spanish (Intermediate proficiency)**HONORS and SCHOLARSHIPS**

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Tau Beta Pi Engineering Honor Society	Inducted 2018
Phi Beta Kappa Honor Society	Inducted 2020
Engineer’s Club of Kansas City Scholarship	2017, 2018, 2019
Tau Beta Pi Scholarship	2019