**Margaret Dugoni**

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**EDUCATION**

**Arizona State University**, Tempe, AZ, August 2023 - Present

Doctor of Philosophy in Biomedical Engineering

* + Arizona State University Fulton School of Engineering Fulton Fellow
  + Fall 2023 Academic Enrichment Award

**Villanova University**, Villanova, PA, June 2023

Bachelor of Science in Chemical Engineering

Minor in Biochemical Engineering

* GPA: 3.63
* Honors:
  + Clare Booth Luce Research Scholar
  + *Project: Improving Gene Therapy Treatments via Inhibition of IRF1* 
    - Winner, 2021 Villanova Research Symposium
    - Big East Poster Competition
    - AIChE Annual Meeting 2022
    - Enabling Technologies Consortium 2022
  + *Project:* *Investigation of Dominant Daily Uptake Factors on Gut Health from Samples in the Database of National Health and Nutrition Examination Survey*
    - ASEE 2022 Participant
* Courses: Bioengineering Lab Techniques, Protein Engineering, Biochemical Data Analysis, Biomaterials, Physiology for Engineers, Cellular Engineering

**Mercy High School**, Burlingame, CA, June 2019

High School Diploma

* GPA: 4.5/4.0, ACT: 33
* Honors:
  + The Spirit of Mercy Memorial Scholarship – Highest award granted to a third-year student for excellence in academics and community service;
  + The President’s Volunteer Service Award – Honors the role of volunteers in America’s strength and national identity whose service positively impacts communities.
  + Excellent participation in the National Chemistry Olympiad Local Competition.
  + Advanced Placement Scholar with Distinction Award
    - AP Chemistry, AP English Language and Composition, AP English Literature and Composition, AP Computer Science, AP Calculus AB

**PUBLICATIONS AND PAPERS**

Isioma Enwerem-Lackland, Eric Warga, **Margaret Dugoni**, Jacob Elmer, & Karmella A. Haynes. Targeted regulation of episomal plasmid DNA expression in eukaryotic cells with a 6meA-binding activator.  *Submitted 9/13/21 to Regenerative Engineering & Translational Medicine.* BioRxiv preprint: url: <https://www.biorxiv.org/content/10.1101/2021.11.01.466616v1>

Warga E, Tucker M, Harris E, Elmer J. Transcriptomic analysis of the innate immune response to plasmid DNA in vitro.  *Submitted to Molecular Therapy - Nucleic Acids; currently undergoing final revisions.*[Collaborator].

**M Dugoni**, N Kaye, Z Huang. Investigation of Dominant Daily Uptake Factors on Gut Health from Samples in the Database of National Health and Nutrition Examination Survey. 2022 ASEE Mid-Atlantic Section Spring Conference. New Jersey Institute of Technology, NJ, 2022. *Selected Peer Reviewed Conference Paper.*

**ENGINEERING EXPERIENCE AND RESEARCH**

**Fulton Fellow,** Tempe, AZ, August 2023 – Present

Immunomodulatory Biomaterials for Osteoporosis

* Developing osteoblast cell line from human mesenchymal stem cells to evaluate the osteogenic effects of metabolite microparticles in hydrogel injections through BMP2-induced and bone particle mediated bone repair.

**Gene Therapy Research Fellow**, Villanova, PA, June 2020 - Present

*Improving Gene Therapy by Inhibiting Cytokine-Stimulated Genes*

* CRISPR/Cas9 and gRNAs to completely isolate gene targets in cell lines.
* Examined efficiency of various potential small molecule drug inhibitors for IRF1/IRF3/IRF9.
* Designed shRNAs for IRF1/IFI16 gene target silencing.
* Generating monoclonal target lines for IRFs
* UV-vis spectroscopy, electroporation, sequencing, primer design, PCR

**Biochemical Data Analytics Research Assistant**, Villanova, PA, January 2022 – June 2022

Project: *Investigation of Dominant Daily Uptake Factors on Gut Health from Samples in the Database of National Health and Nutrition Examination Survey*

* Use R programming to analyze NHANES data for gastrointestinal impacts on various nutritional factors.

**Gene Therapy MATCH Fellow**, Villanova, PA, January 2020 – June 2020

* Present Improving Gene Therapy by Inhibiting Cytokine-Stimulated Genes
* Use CRISPR/Cas9 to completely isolate gene targets in cell lines.
* Developed plasmids that express Cas9 and gRNAs to compare the transfection efficiencies.

**DIY Spectrophotometer Mini Project**, Villanova, PA, October 2019-January 2020

* Collaborated with three classmates to build and program a colorimeter that detects hemoglobin levels within blood samples using LED analysis.

**GRAIL** / **Shadow** June 2018, Menlo Park CA

* Shadowed the Head of Operations of Research and Development.
* Studied models to identify tumor genome data obtained through high-intensity sequencing.

**National Youth Leadership Forum: Medicine** / **Participant** July 2017, University of California at Berkeley, Berkeley, CA

* Awarded a scholarship to attend this challenging program. Participated in an interactive curriculum led by advisors, and physicians. Tested medical knowledge during clinical skills rotations and explored professional opportunities in the fields of medicine and health care.

**EMPLOYMENT**

**Coherus BioSciences, Product Development Intern,** Redwood City, CA, June 2022-August 2023

Workload Management Software and Product Management (August 2022 – August 2023):

* Developed program level dashboards for program manager timeline tracking and key personnel assignments. Identified individual department need and developed over 10 working prototypes for task tracking Smartsheet dashboards for each drug project team.
* Met with key shareholders to evaluate department needs and developed Smartsheet workload management software. Presented prototype ideation and modified dashboards incorporating project team/stakeholder feedback. Worked with cross functional teams including Quality Assurance, Finance, Supply Chain, Device, Inspection Management, and Product Development department team members to develop useful department software and allow for open communication on workloads.
* Used software to develop a communication tool showing workload and resourcing constraints
* Developed a tracking management platform for FDA inspection requests and allowed for automated process flow.
* Coded automatically-generating timeline metrics to assist in future project planning to improve automatic updates.
* Assisted in tracking of authoring and review sections for an investigational new drug (IND) submission to the FDA.

Drug Development Systems and Processes for Product Development (Management) Department (June– August 2022):

* Created and implemented a centralized scientific literature reference manager database platform for company drug development programs.
* Collected and organized over 2,500 technical references by mechanism of action. Worked cross-functionally and independently with minimal supervision. Delivered project on time and exceeded target goals for references. Provided a presentation and training to scientific staff and leadership.
* Supported project teams through delivery of clinical trial reports and scientific literature for existing immuno-oncological drug development programs to support competitive intelligence efforts.

Regulatory Affairs Processes Improvement for Project Delivery (June– August 2022):

* Distributed ‘lessons learned’ surveys to product development teams to gather feedback and determine approaches for process improvement on FDA regulatory submissions. Initiating implementation of potential solutions, including automating processes authoring, reviewing, and approving regulatory documents for FDA submission.
* Assisted in an FDA prior-approval supplement (PAS) submission for an approved drug through a quality assurance process for source documents.

**Villanova University, Teaching Assistant,** Villanova, PA, October 2022-December 2022

* Assisted in the teaching Engineering Interdisciplinary Project: DIY Spectrophotometry
* Instructed in enzyme kinetics and colorimetric reactions to monitor with SolidWorks and 3D printed spectrophotometers, programmed in Arduino.
* Prepped ONPG/NP samples for measurement along with alpha-galactosidase enzyme aliquots.

**The Sandwich Spot, Cashier**, San Carlos, CA, June 2018 - January 2021

* Ran the register, balanced and documented financial transactions, closed the shop, and interacted with customers.

**Serra Sports and Recreation Camp / Lead Summer Camp Counselor** June 2016 - August 2019, San Mateo, CA

* In charge of organizing cooperative games, swim lessons, and communication with parents. Applied basic first aid. Managed junior counselors.

**LEADERSHIP AND ACTIVITIES**

2023 – Present

Society for Biomaterials at Arizona State University, Tempe, AZ

Chemical and Biological Sciences Society, Arizona State Chapter, Tempe, AZ

Chemical Engineering Graduate Student Association, Arizona State Chapter, Tempe, AZ

2019-2023:

*Vice President,* American Institute of Chemical Engineers, Villanova Chapter, Villanova, PA

*Vice President,* National Society of Professional Engineers, Villanova Chapter, Villanova, PA

*Graphics Chair,* Relay for Life, American Cancer Society, Villanova, PA

Society of Women Engineers

Omega Chi Epsilon Chemical Engineering Honor Society

Scientista - Women in Science and Engineering

Society for Biological Engineering

2015-2019:

California Scholarship Federation 2015-2019

*Vice President*, National Honor Society, Mercy Chapter, Burlingame, CA

*President*, Red Cross Club, Mercy High School Chapter, Burlingame CA

Science National Honor Society

Mu Alpha Theta Math Honor Society

Rho Kappa History Honor Society

Tri-M Music Honor Society

Mercy High School Student Ambassador

*President and founder* of the Innovators Club (engineering, robotics, and Girls Who Code)

**SKILLS**

Proficiency in coding in Java, MATLAB, R/RStudio, ASPEN, and Mathcad.

Proficiency in use of Microsoft Word, Excel, PowerPoint, Google Office, Mendeley, EndNote, Smartsheet, RStudio coding.

Proficiency in cell culture, CRISPR/Cas9, PCR, RNAseq, RNAi, small molecule inhibitors, viral gene delivery, flowcytometry, gDNA extraction, qPCR, Mini Prep, and UV Visual spectroscopy.

**VOLUNTEER EXPERIENCE**

Graphics Chair October 2019-2022, Villanova, PA. Relay for Life, American Red Cross.

Designed all the graphics to notify the community of our fundraising events. Volunteered at Hope Lodge, a place for patients receiving cancer treatments and their families to stay that would be closer to hospitals.

Elementary School Tutor Sep 2016 - May 2019, Redwood City, CA. Generations United, Inc. Tutored elementary school children in impoverished areas on reading, writing, and math, when their first language was not English.