Devorah Cahn

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EDUCATION

University of Maryland, College Park (UMD) — College Park, MD
PhD in Bioengineering — Expected: August 2024
GPA: 4.0

University of Maryland, Baltimore County (UMBC) — Baltimore, MD
Bachelor of Science in Chemical Engineering — December 2018
Bachelor of Science in Biology — Overall GPA: 3.876

PROFESSIONAL EXPERIENCE

Wolf Lab (National Cancer Institute) — Frederick, MD
NCI-CRTA Fellow — August 2021 – Present

- Decellularized porcine lung, liver, and small intestines to obtain decellularized extracellular matrix (dECM)
- Characterized DNA, glycosaminoglycan (GAG), and collagen content of decellularized tissue using Picogreen dsDNA, sGAG, hydroxyproline, and Sircol assays
- Created dECM hydrogels for use as an ECM model through the rehydration of cryomilled dECM
- Analyzed the bulk rheological properties of dECM hydrogels using a parallel plate rheometer
- Cultured and characterized the size of cell spheroids (A549 cell line)
- Assessed nanoparticle uptake in cell spheroids embedded in dECM hydrogels via fluorescent confocal microscopy

Duncan Lab (University of Maryland) — College Park, MD
Graduate Research Assistant — April 2020 – Present

- Modified the surface chemistry of nanoparticles via PEGylation using NHS-EDC chemistry
- Characterized the size and zeta potential of nanoparticles using dynamic light scattering (DLS)
- Calculated the PEGylation density on the surface of nanoparticles using a PDAM assay
- Analyzed stability of nanoparticles in serum via DLS and protein adsorption through a BCA assay
- Cultured cells (HEK-293T and A549) and analyzed nanoparticle uptake in the cells using fluorescence normalized to cell protein content
- Studied nanoparticle mobility in Matrigel, sputum from patients with cystic fibrosis (CF) lung disease, and in dECM hydrogels using multiple-particle tracking (MPT) via fluorescent confocal microscopy
- Analyzed nanoparticle uptake in cells embedded in dECM hydrogels via confocal microscopy and flow cytometry
- Formulated nanorods from nanospheres via mechanical stretching
- Encapsulated quantum dots in adeno-associated viruses (AAV)
- Fabricated mucin hydrogels and characterized their viscoelastic properties using bulk and micro-rheology
- Evaluated the use of mucin hydrogels as a viable collection material in an air sampler
- Mentored and trained undergraduate and graduate students in the lab

Lavik Lab (University of Maryland Baltimore County) — Catonsville, MD
Undergraduate Research Assistant — June 2017 – August 2019

- Synthesized peptide conjugated nanoparticles to aid in blood clotting for traumatic injury
- Synthesized various polymers including poly(l-lactic acid) (PLLA), poly(d-lactic acid) (PDLA), poly(l-lactic acid)-polyethylene glycol (PLLA-PEG), and poly(lactic-co-glycolic acid)-poly(ethylene glycol) (PLGA-PEG) and characterized their molecular weight using gel permeation chromatography (GPC)
- Created PLGA microspheres containing a HIF-1-alpha inhibitor to be used as a potential treatment for age-related macular degeneration using various single and double emulsion techniques
- Characterized size, loading, and release of microspheres using a plate reader, Coulter counter, and ImageJ
- Cultured cells and tested effects of drug released from microspheres using an MTT assay

SKILLS & ACHIEVMENTS

Publications:

- **Devorah Cahn**, Mayowa Amosu, Katharina Maisel, Gregg Duncan. *Biomaterials for Intranasal and Inhaled Vaccine Delivery*. Nature Reviews Bioengineering; January 2023. https://doi.org/10.1038/s44222-022-00012-6
- **Devorah Cahn**, Gregg Duncan. *High-Density Branched PEGylation for Nanoparticle Drug Delivery*. Cellular and Molecular Bioengineering; July 2022. https://doi.org/10.1007/s12195-022-00727-x
- Daniel Song, **Devorah Cahn**, Gregg Duncan. *Mucin Biopolymers and Their Barrier Function at Airway Surfaces*. Langmuir; October 2020. https://doi.org/10.1021/acs.langmuir.0c02410
- Hannah Aris, Shayan Borhani, **Devorah Cahn**, Colleen O'Donnell, Elizabeth Tan, Peng Xu. *Modeling transcriptional factor cross-talk to understand parabolic kinetics, bimodal gene expression and retroactivity in biosensor design*. Biochemical Engineering Journal Volume 144. 15 April 2019. Pages 209-216. https://doi.org/10.1016/j.bej.2019.02.005
- Co-author on six bacteriophage genome NCBI entries (Accessions: MK620900, MK686068, MK686069, MK686070, MF686071, and MK686072)

Presentations:

Biomedical Engineering Society Conference 2022 October 2022
Biomedical Engineering Society, poster San Antonio, TX

Computers*:*
MATLAB, Aspen Plus, Microsoft Office (Excel, Word, and PowerPoint), GraphPad Prism

Graduate Student Government:
Student Affairs Committee November 2022 – Present

AWARDS

Fellowships: NCI-CRTA Fellow through NCI-UMD Partnership August 2021-Present

Clark Doctoral Fellow Mid-Career Award February 2023-Present

Honors: Tau Beta Pi Engineering Honors Society, President's List, Dean's List

TEACHING EXPERIENCE

ESTEEM/SER-Quest College Park, MD
Mentor July 2021

- Organized laboratory experiments and lessons in engineering for high school students
- Prepared fluid dynamics experiments for fluid viscosity of different liquids
- Helped students design liquids for blood simulation

University of Maryland College Park, MD
Graduate Teaching Assistant, Biology for Engineers Laboratory January 2021 – May 2021

- Led lab sessions and assisted students with completing their lab coursework

University of Maryland College Park, MD
Graduate Teaching Assistant, Modeling Physiological Systems and Lab August 2020 – December 2020

- Prepared and graded laboratory assignments including MATLAB modeling of disease spreading, action potentials, calcium transport in smooth muscle cells, and ECGs
- Led lab sessions to assist students in completing assignments

UMBC Chemistry Tutorial Center Catonsville, MD
Chemistry Tutor January 2017 – December 2018

- Held tutoring sessions for groups of 4 to 6 students in general and organic chemistry

UMBC Catonsville, MD
General Chemistry Learning Assistant January 2017 – May 2017

- Aided students taking a general chemistry course and answered their questions during assignments in class