

# David Peeler

dj.peeler@gmail.com • 410-952-9594 • linkedin.com/in/djpeeler

## EDUCATION

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- University of Washington, Seattle** Sept 2014  
Department of Bioengineering, Ph.D. Student Dec 2019  
Certificate in Molecular Medicine  
3.87 / 4.00
- University of Maryland, College Park** Sept 2009  
Bachelor of Science, Bioengineering Dec 2013  
University Honors College  
3.72 / 4.00

## RESEARCH EXPERIENCE

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- Graduate Research Assistant**, University of Washington, Seattle, WA Jan 2015  
Laboratory of Professor Suzie Pun Present  
Department of Bioengineering
- Reprogramming neural stem cells *in vivo* through pH-sensitive polymer mediated delivery of transcription factor genes.
  - Developing targeted, pH-sensitive polymers for peptide vaccine applications.
- ORISE Research Fellow**, U. S. Food and Drug Administration, White Oak, MD May 2013  
Laboratory of Dr. Brendan Casey Aug 2014  
CDRH, OSEL, Division of Chemistry and Materials Science
- Evaluated the size-dependent antimicrobial efficacy and biocompatibility of silver nanoparticles in solution and in airspun PLGA/PEG nanofiber meshes.
- Undergraduate Research Assistant**, University of Maryland, College Park, MD Dec 2011  
Laboratory of Professor Silvina Matysiak May 2013  
Department of Bioengineering
- Designed and tested molecular dynamics simulations to elucidate the impact of surface chemistry and solution salinity on norovirus capsid protein adsorption.
- Laboratory Intern**, Johns Hopkins School of Medicine, Baltimore, MD Summer 2011  
Laboratories of Professors Garry Cutting and Pamela Zeitlin  
Institute of Genetic Medicine
- Conducted bioinformatics analysis of differentially-methylated regions in the epigenomes of monozygotic twins with Cystic Fibrosis identified in a GWAS.
  - Established an online database for real-time patient data collection and worked with physicians to initiate its usage in clinical trials of Cystic Fibrosis drugs.

## TECHNICAL SKILLS

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**Laboratory:** Controlled free radical polymer synthesis (RAFT); solid phase peptide synthesis; flow cytometry; confocal microscopy; electron microscopy (transmission, scanning); nanomaterial characterization; chromatography (HPLC); mouse work (breeding, stereotactic injection, blood draw, dissection, cryo-histology, immunohistochemistry); primary neural cell isolation and culture; molecular biology (scRNA-seq; Western blot; cloning); ssDNA aptamer SELEX; peptide phage display.

**Computational:** Python, Graph Pad, FlowJo, Adobe Creative Suite, Microsoft Office

## RESEARCH INTERESTS

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Biologic drug delivery • Bioconjugate and polymer chemistry • Vaccines • Single cell bioinformatics

## PUBLICATIONS

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GW Liu, SL Johnson, R Jain, **DJ Peeler**, S Shankland, SH Pun. "Optimized non-viral gene delivery for primary urinary renal progenitor cells to enhance cell migration" (2019) *Journal of Biomedical Materials Research: Part A* (accepted).

**DJ Peeler**, SN Thai, YL Cheng, PJ Horner, DL Sellers, SH Pun. "pH-sensitive polymer micelles provide selective and potentiated lytic capacity to venom peptides for effective intracellular delivery" (2019) *Biomaterials*, 192: 235-244.

**DJ Peeler**, DL Sellers, SH Pun. "pH-sensitive polymers as dynamic mediators of barriers to nucleic acid delivery" (2019) *Bioconjugate Chemistry*, 30(2): 350-365.

AB Rosenberg, CM Roco, RA Muscat, A Kuchina, P Sample, Z Yao, L Gray, **DJ Peeler**, S Mukherjee, W Chen, SH Pun, DL Sellers, B Tasic, G Seelig. "Single-cell profiling of the developing mouse brain and spinal cord with split-pool barcoding" (2018) *Science*, 360(6385):176-182.

DP Feldmann, YL Cheng, R Kandil, Y Xie, M Mohammadi, H Harz, A Sharma, **DJ Peeler**, A Moszczynska, H Leonhardt, SH Pun, OM Merkela. "In vitro and in vivo delivery of siRNA via VIPER polymer system to lung cells" (2018) *Journal of Controlled Release*, 276:50-58.

YL Cheng, DL Sellers, JY Tan, **DJ Peeler**, PJ Horner, and SH Pun. "An effective way to address the dilemma of stability and cargo release for polycation/DNA complexes in gene delivery" (2017) *Biomaterials*, 127:89-96.

YL Cheng, H Wei, JY Tan, **DJ Peeler**, DO Maris, DL Sellers, PJ Horner, and SH Pun. "Nano-sized sunflower polycations as effective gene transfer vehicles" (2016) *Small*, 12(20):2750-58.

KS Butler, BJ Casey, **DJ Peeler**, BJ Dair, RK Elespuru. "Genotoxicity of Nanomaterials: Probing the Responses of the Bacterial Assays" (2015) *Environmental and Molecular Mutagenesis*, 56:S79.

KS Butler\*, **DJ Peeler**\*, BJ Casey, BJ Dair, RK Elespuru. "Silver Nanoparticles: Correlating NP Size and Cellular Uptake with Genotoxicity." (2015) *Mutagenesis*, 30(4):577-91.

## PRESENTATIONS

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**DJ Peeler**, SN Thai, YL Cheng, PJ Horner, DL Sellers, SH Pun. "Lytic peptide polymer properties that promote endosomal escape of nucleic acid cargo" Oligonucleotide Therapeutics Society 2018 Annual Meeting (talk and poster)

J Lee, T Zhao, **DJ Peeler**, DL Sellers, PJ Horner, SH Pun. "A Self-Assembling Injectable Hydrogel for Spinal Cord Rehabilitation" NanoDDS 2018 (poster)

**DJ Peeler**, SN Thai, DL Sellers, SH Pun. "Venom peptide-polymer conjugates enable enhanced endosomal escape of biomacromolecules" GRS/GRC Drug Carriers in Medicine 2018 (poster)

**DJ Peeler**, YL Cheng, DL Sellers, SH Pun. "Venom peptide-polymer conjugates for enhanced endosomal escape of biomacromolecule cargo" NanoDDS 2017 (poster)

YL Cheng, DL Sellers, JY Tan, **DJ Peeler**, SH Pun. "Benzoic imine bond based pH sensitive polycations as effective gene carriers" Controlled Release Society Annual Meeting 2016 (poster)

**DJ Peeler**, BJ Casey. "Silver Nanoparticles: Correlating NP Size and Cellular Uptake with Genotoxicity" Center for Devices and Radiological Health Research Conference 2013 (poster)

**DJ Peeler**, S Matysiak. "A Molecular Dynamics Investigation of the Physical-Chemical Properties of Calicivirus Capsid Protein Adsorption to Fomites" American Physical Society Spring Meeting 2013 (poster)

**DJ Peeler**, S Matysiak. "A Molecular Dynamics Investigation of the Impact of Surface Chemistry on the Binding of Surrogate Human Norovirus Capsid Proteins" Biomedical Engineering Society Annual Meeting 2012 (poster)

## PATENTS

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## **AWARDS**

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- Holloman Health Innovation Challenge 2<sup>nd</sup> place (\$10k for BWB) 2017
- National Science Foundation Graduate Research Fellowship Honorable Mention 2016
- PATH Health Innovation Portfolio Grant (\$50k for BWB) 2016
- Global WACH & W.H. Coulter Foundation Pilot Grant (\$30k for BWB) 2015
- Oak Ridge Institute for Science and Education (ORISE) Research Fellowship 2013-2014
- Presidential Merit Scholarship, University of Maryland (half tuition) 2009-2013
- Student Speaker for the Clark School of Engineering Graduation Ceremony 2013
- Fischell Department of Bioengineering Outstanding Citizen Award 2013
- Maryland Technology Enterprise Institute ASPIRE Research Award (\$3000 grant) 2013
- Maryland Summer Scholars Award for Undergraduate Research (\$3000 grant) 2012
- BMES Student Travel Award (full registration and \$400 stipend) 2012
- Samuel J. Wendler Memorial Scholarship (\$1000) 2011

## **LEADERSHIP & TEACHING EXPERIENCE**

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- Direct mentor of Undergraduate Research Assistant, Nicholas Luera 2018-pres.
- Direct mentor of Undergraduate Research Assistant, Salina Thai 2016-2018
- Direct mentor of Undergraduate Research Assistant, Armin Rouz 2015-2016
- PHRMRA528: Medical Risk Analysis and Management – Teaching Assistant 2014-2018
- UW Bioengineers Without Borders – Anesthetic Delivery Device Team co-Leader 2014-2018
- UMD Biomedical Engineering Society – President 2011-2013
- UMD Student Government Association – Legislative Representative 2012-2013
- UMD Engineers Without Borders – Bioretention Team Leader 2010-2011

## **OUTREACH ACTIVITIES**

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- Bioengineering Summer Camp – Seattle, WA 2015-2018
- Paws-on Science Days – Seattle, WA 2015, 2016
- Discover Engineering Days – Washington, D.C. and Seattle, WA 2010-2018
- BMES Underclassmen Mentoring Program – College Park, MD 2011-2013
- Alternative Spring Break: Maternal and Children's Health Issues – Columbia, SC 2012
- Terp Service Days: Fighting Homelessness and Hunger – College Park, MD 2011-2013