David W. McKellar

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EDUCATION:

Cornell University – *Ithaca, NY* **Jul. 2018 - May 2023 (*expected*)**
- PhD in Biomedical Engineering
- Mentors: **Benjamin Cosgrove, PhD** & **Iwijn De Vlaminck, PhD**

Georgia Institute of Technology – *Atlanta, GA* **May 2016**
- Bachelor of Science with Honor in Biomedical Engineering, minor in Biology
- Pacific Program Study Abroad – *New Zealand, Australia, Fiji* **Jan. 2014-May 2014**
- BME Galway Summer Program – *NUI Galway, Galway, Ireland* **May 2015-Jul. 2015**

RESEARCH EXPERIENCE:

PhD Student – *Dept. of Biomedical Engineering, Cornell University; Ithaca, NY* **Jul. 2018-Present**
- PIs: **Benjamin Cosgrove, PhD** & **Iwijn De Vlaminck, PhD**
- Large-scale computational analyses of single-cell RNA sequencing in skeletal muscle
- Analysis of ncRNAs in muscle regeneration using single-cell, spatial, and nascent RNA sequencing

Clinical Research Experience – *Hospital For Special Surgery; New York City, NY* **Jun. 2019-Aug. 2019**
- Mentors: **Laura Donlin PhD & David Fernandez, MD**
- Characterized infiltrating immune populations in rheumatoid arthritis with single-cell RNA sequencing

Postbaccalaureate Fellow – *National Human Genome Research Institute; Bethesda, MD* **Jun. 2016-Jun. 2018**
- PI: **P. Paul Liu, MD/PhD**
- Identified pathogenic mutations in Familial Platelet Disorder (FPD) through analysis of whole exome sequencing
- Established a model of the hematopoietic defects of FPD using directed differentiation of patient-specific iPSCs
- Identified small molecule compounds that enhance the directed differentiation of iPSCs

Undergraduate Research Assistant – *Dept. of Biomedical Engineering, Georgia Tech; Atlanta, GA* **Jan. 2015-May 2016**
- PI: **Manu O. Platt, PhD**
- Synthesis, purification, and molecular analysis of recombinant mutant proteases associated with breast cancer

PREPRINTS & PUBLICATIONS:

Lee, U., Stuelsatz, P., Karaz, S., **McKellar, D. W.**, Russeil, J., Deak, M., de Vlaminck, I., Lepper, C., Deplancke, B., Cosgrove, B. D., & Feige, J. N. (2022). A Tead1-Apelin axis directs paracrine communication from myogenic to endothelial cells in skeletal muscle. *iScience*, 25 (7), 104589. https://doi.org/10.1016/j.isci.2022.104589

McKellar, D. W., Mantri, M., Hinchman, M., Parker, J. S. L., Sethupathy, P., Cosgrove, B. D., Vlaminck, I. de. (2022). In situ polyadenylation enables spatial mapping of the total transcriptome. *BioRxiv*, 2022.04.20.488964. https://doi.org/10.1101/2022.04.20.488964

Mantri, M., Hinchman, M. M., **McKellar, D. W.**, Z Wang, M. F., L Parker, J. S., de Vlaminck, I. (2021). Spatiotemporal transcriptomics reveals pathogenesis of viral myocarditis. *BioRxiv*. https://doi.org/10.1101/2021.12.07.471659

McKellar, D.W., Walter, L.D., Song, L.T. et al. Large-scale integration of single-cell transcriptomic data captures transitional progenitor states in mouse skeletal muscle regeneration. *Commun Biol* 4, 1280 (2021). https://doi.org/10.1038/s42003-021-02810-x

McKellar, DW, Walter, LD, Song, LT, Mantri, M, Wang, MFZ, De Vlaminck, I, Cosgrove, BD (2020) Strength in numbers: Large-scale integration of single-cell transcriptomic data reveals rare, transient muscle progenitor cell states in muscle regeneration. *bioRxiv* 2020.12.01.407460. doi:10.1101/2020.12.01.407460

Wang, MFZ, Mantri M, Chou S-P, Scuderi GJ, **McKellar DW**, Butcher JT, Danko CG, De Vlaminck, I. Uncovering transcriptional dark matter via gene annotation independent single-cell RNA sequencing analysis. *Nat. Commun*. 12, 2158 (2021).

Mantri, M., Scuderi, GJ, Abedini-Nassab, R, Wang, MFZ, **McKellar, DW**, Shi, H, Grodner, B, Butcher, JT, De Vlaminck, I. Spatiotemporal single-cell RNA sequencing of developing chicken hearts identifies interplay between cellular differentiation and morphogenesis. *Nat. Commun*. 12, 1771 (2021).

ORAL PRESENTATIONS:

Gordon Research Conference, Single-Cell Genomics – *Les Diablarets, Switzerland* **May 3, 2022**
- *Strength in Numbers: Exploring Muscle Regeneration Through Single-Cell and Spatial Transcriptomics*

2021 BMES Annual Meeting – *Orlando, FL, USA* **Oct. 7, 2021**
- *Spatiotemporal Muscle Cell Interaction Mapping by Large-scale Single-cell Transcriptomic Integration*

Cornell BMES Symposium – *Ithaca, NY, USA* **Aug. 20, 2021**
- *Strength in numbers: Exploring rare cell states through large-scale integrative single-cell transcriptomics*

Cornell Stem Cell Program, 8th Stem Cell Symposium – *Online* **Jun. 14, 2021**
- *Strength in numbers: Exploring rare cell states through large-scale integrative single-cell transcriptomics*

Cornell Single-Cell Working Group Seminar – *Online* **May 20, 2020**
- *Lessons learned from large-scale integration of single-cell RNA sequencing datasets*

Cornell Stem Cell Program WIP Seminar – *Ithaca, NY, USA* **Nov. 19, 2019**
- *Integrating single-cell and nascent RNA sequencing to identify regulatory factors in myogenesis*

NIH Postbac Seminar Series – *Bethesda, MD, USA* **Oct. 17, 2017**
- *Identification of germline mutations contributing to leukemogenesis in Familial Platelet Disorder*

NHGRI Translational And Functional Genomics Branch Meeting – *Bethesda, MD* **May 26, 2017**
- *Modeling the hematopoietic defects of Familial Platelet Disorder with patient-specific iPSCs*

Georgia Tech InVenture Semi-Finals – *Atlanta, GA, USA* **Feb. 2, 2016**
- *Enabling Meniscal Root Repair*

POSTER PRESENTATIONS:

Gordon Research Conference, Single-Cell Genomics – *Les Diablarets, Switzerland* **May 3, 2022**
- *Strength in Numbers: Exploring Muscle Regeneration Through Single-Cell and Spatial Transcriptomics*

The New York Stem Cell Foundation Conference – *Online* **Oct. 20, 2020**
- *Large-scale integration of single-cell transcriptomic data reveals rare, transient muscle progenitor cell states critical for muscle regeneration*

2019 BMES Annual Meeting – *Philadelphia, PA* **Oct. 18, 2019**
- *Integrating Single-Cell and Nascent RNA Sequencing to Identify Regulatory Factors in Myogenesis*

NIH Postbaccalaureate Poster Day 2018 – *Bethesda, MD* **May 2, 2018**
- *Establishment of RUNX1-reporter hiPSC lines to identify compounds that promote hematopoietic differentiation*

2017 NHGRI Symposium – *Bethesda, MD* **Oct. 26, 2017**
- *Modeling the hematopoietic defects of Familial Platelet Disorder with patient-specific iPSCs*

NIH Research Festival – *Bethesda, MD* **Sep. 15, 2017**
- *Modeling the hematopoietic defects of Familial Platelet Disorder with patient-specific iPSCs*

NIH Postbaccalaureate Poster Day 2017 – *Bethesda, MD* **May 4, 2017**
- *High-throughput drug screening with iPSC differentiation models for the enhancement of hematopoietic stem cell development*

The Georgia Tech Annual Undergraduate Research Spring Symposium – *Atlanta, GA* **Apr. 19, 2016**
- *Synthesis of mutant proteases for the study of feedback mechanisms in cancer metastasis and cardiovascular disease*

Georgia Tech Senior Design Expo – *Atlanta, GA* **Dec. 2, 2016**
- *Cobra Guide for Meniscal Root Repair*

HONORS, AWARDS, & SCHOLARSHIPS:

T32 pre-doctoral training grant –*Immuno-Engineering: Integrated Engineering and Immunology Training* **Aug. 2021-Present**
1st Place, Stem Cell Symposium Virtual Poster Competition –*Cornell Stem Cell Program* **Jun. 14, 2021**
NSF GRFP Honorable Mention –*National Science Foundation* **Apr. 8, 2019**
2018 Postbac Poster Day Award –*National Institutes of Health; Bethesda, MD* **May 2, 2018**
NSF GRFP Honorable Mention –*National Science Foundation* **Apr. 3, 2018**
2017 NHGRI Symposium Poster Award – *National Human Genome Research Institute; Bethesda, MD* **Oct. 26, 2017**
NIH Postbaccalaureate Intramural Research Training Award – *NHGRI; Bethesda, MD* **Jun. 2016-Jun. 2018**
President's Undergraduate Research Award – *Georgia Institute of Technology; Atlanta, GA* **Jan. 2016-May 2016**
Dean's List – *Georgia Institute of Technology; Atlanta, GA* **Aug. 2012-May 2016**
Zell Miller/HOPE Scholarship – *Georgia Student Finance Commission* **Aug. 2012-May 2016**
Pattillo Scholarship Fund Scholarship – *Community Foundation for Greater Atlanta; Atlanta, GA* **Aug. 2012-May 2016**

TEACHING EXPERIENCE:

Guest Lecturer – *Dept. of Biomedical Engineering, Cornell University* **Oct. 2019**
- **"**Stem Cell Bioengineering" (*BME 6110*); lead by Benjamin Cosgrove, PhD

Teaching Assistant – *Dept. of Biomedical Engineering, Georgia Institute Of Technology* **Jan. 2015-May 2015**
- "Problems in Biomedical Engineering" (*BME 1300*); lead by Kathleen McNeeley Myers, PhD and Barbara Fasse, PhD

LEADERSHIP ACTIVITIES:

Member, College Of Engineering Graduate Student Advisory Board – *Cornell University* **Apr. 2022-Present**
- Developed programming for promoting the professional use of social media platforms in science

Communications Director – *Biomedical Engineering Society; Cornell University* **Dec. 2018-Dec. 2019**
- Developed programming for promoting the professional use of social media platforms in science

Executive Vice President – *Biomedical Research Opportunities Society; Georgia Tech* **Aug. 2012-May 2014**
- Coordinated presentations from Georgia Tech investigators and workshops on how to get involved in research

COMMUNITY SERVICE ACTIVITIES:

New Visions Engineering– *TST BOCES; Ithaca, NY* **Sep. 2018-May 2019**

- Served as a mentor for high school students interested in engineering

Linkages 2 Learning– *EveryMind; Silver Spring, MD* **Sep. 2017-Dec. 2017**

- Provided after school STEM programming/tutoring to local elementary school students

NHGRI Education and Community Involvement Branch – *Bethesda, MD* **May 2017-Jun. 2018**

- Helped provide educational programming on genomics and gene editing to students and the general public

Friends Of Disabled Adults And Children – *Stone Mountain, GA* **Apr. 2016-Dec. 2016**

- Optimized warehouse layout for improved operations efficiency and storage capacity