

# RACHEL LÉA BALLANTYNE DRAELOS

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firstname [AT] cs.duke.edu

## EDUCATION & AWARDS

**Duke University**, Durham, NC

**Computer Science PhD student** • Jan 2017 – *present*

Lawrence Carin's research group. Interests: machine learning applied to medicine.

**Medical Scientist Training Program** • Aug 2014 – May 2022

with a full NIH scholarship for all M.D. training and two years of graduate school.

Completed the first 2 years of medical school, and the first three medical licensing exams (USMLE Step 1, USMLE Step 2 CS, and USMLE Step 2 CK)

**Cornell University** College of Arts and Sciences, Ithaca, NY • Aug 2010 – May 2013

Bachelor of Arts in Biological Sciences, Concentration in Computational Biology

- Graduated in three years
- Phi Beta Kappa
- Magna Cum Laude with Academic Distinction in All Subjects; GPA 3.95
- Dean's List every semester

Additional: MCAT score 40 (2013; 99<sup>th</sup> percentile), National Merit Scholar (2010)

## RESEARCH

**Computer Science PhD Student in [Lawrence Carin's group](#)** • May 2017 – *present*

Current project: automated interpretation of volumetric computed tomography images

Oral Presentations: Fall 2017 Duke MSTP Retreat, Fall 2018 MSTP Seminar Series

Posters: Spring 2018 MSTP Symposium

Collaborative projects:

Vector representations of words (with Cynthia Rudin, PhD)

Mutation pathogenicity prediction (with Andrew Landstrom, MD, PhD)

**Computational Biology Research Programmer** • July 2013 – July 2014

- Laboratories of Muredach Reilly, MBBCh, MSCE, and Mingyao Li, PhD
- University of Pennsylvania Perelman School of Medicine

Applied computational approaches to study the genetics of human cardiometabolic disease, with a focus on long noncoding RNAs and glycogenes.

Posters: 2014 Keystone conference, 2014 ASBMB/EB conference.

Related Publications:

**Ballantyne RL**, Zhang X, Nunez S, Xue C, Zhao W, Reed E, Salaheen D, Foulkes A, Li M, Reilly MP. "[Genome-wide interrogation reveals hundreds of long intergenic noncoding RNAs that associate with cardiometabolic traits.](#)" *Hum. Mol. Genet.* 2016.

Liu Y, Ferguson JF, Xue C, **Ballantyne RL**, Silverman IM, Gosai SJ, Serfecz J, Morley MP, Gregory BD, Li M, and Reilly MP. "[Tissue-Specific RNA-Seq in Human Evoked Inflammation Identifies Blood and Adipose LincRNA Signatures of Cardiometabolic Diseases.](#)" *ATVB* 2014; 34:902-912.

**Biomedical Researcher (Senior Honors Thesis)** • October 2011 – May 2013

- Laboratory of Alan Nixon, BVSc, MS
- Cornell University Department of Clinical Sciences

Improved the transfection efficiency of equine mesenchymal stem cells from 10% to 54%, thereby enhancing their therapeutic potential.

**Muscle Biology Researcher** • January 2011 – December 2011

- Laboratory of John Hermanson, PhD
- Cornell University Department of Biomedical Sciences

Studied bat evolution, ecology, and anatomy.

**DUKE**

**Graduate GPA:** 4.0

**COURSEWORK**

**Ph.D. Year 3 courses (2019):** Computer Security (*in progress*)

**Ph.D. Year 2 courses (2018):** Bayesian and Modern Statistics (A), Artificial Intelligence (A), Privacy and Fairness in Data Science (A)

**Ph.D. Year 1 courses (2017):** Advanced Computer Architecture (A+), Computational Complexity (A), Numerical Analysis (A)

**M.D. Year 2 clerkships (2015 – 2016):** Medicine, Radiology, Family Medicine, Surgery, Obstetrics/Gynecology, Practice Course II, Clinical Skills, Neurology, Psychiatry, Pediatrics

**M.D. Year 1 courses (2014 – 2015):** Histology, Molecules Cells & Tissues, Anatomy, Physiology, Microanatomy, Brain & Behavior, Body & Disease, Practice Course I

**LEADERSHIP  
& TEACHING**

[Duke +DS Computed Tomography Team Leader](#) (Fall 2018 – *present*)

[Duke School of Medicine Admission Liaison](#) (2017 – *present*)

[Lecturer at the Machine Learning Winter School](#) (Spring 2019)

Teaching Assistant for CS 290 Data Science Competition (Spring 2018)

Brogden Middle School Tech Careers talk (Fall 2017)

[Duke SPLASH Teacher Computational Medicine](#) (Spring 2017)

Lecturer at Duke Computer Science and Law Event (Spring 2017)

**MENTORING**

**Undergraduate Students**

Word embeddings (Cynthia Rudin's research group)

Anna Sun (Jan 2018 - *present*)

Kenny Green (Jan 2019 - *present*)

Jake Shulman (Jan 2019 - *present*)

Divya Koyalagunta (Jan 2018 - Aug 2018)

CT object detection (+DS)

Suchir Bhatt (Sept 2018 - *present*)

Venkat Subramaniam (Jan 2019 - *present*)

Christopher Wolff (Sept 2018 - Dec 2018)

CT multiple instance learning (+DS)

David Henderson (Sept 2018 - *present*)

Daniel Li (Sept 2018 - *present*)

**ACTIVITIES**

**Writing**

Editor-in-Chief, [Glass Box Medicine Blog](#) (2018 - *present*)

Contributor, [Eno Literary Magazine 2018](#)

Contributor, [Duke Voices, Spring 2018](#)

Songwriter, [Duke Med Student Faculty Show 2017 "The Gunner Games"](#)

Contributor, [Duke Voices, Spring 2017](#)

Editor, [Duke Science Review \(Sept 2014 – May 2015\)](#)

**Athletics**

Cycling (2014 - *present*)

Running (2007 - 2015)

**Music**

Piano (1998 - *present*)

Classical piano lessons from Olive Yao and Elena Romanoff (1998 – 2010)

MUSIC 103 (A) & jazz piano lessons from [Ed Paolantonio](#) (May 2017 – Dec 2017)

Lead singer, Duke Med Student Faculty Show 2015 “Into the Wards”

Soprano in Duke Med a cappella group [Major Groove](#) (Aug 2014 – Apr 2017)