**Clara Cousins**

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**EDUCATION**

**Harvard University** May 2020, Cambridge

Candidate for A.B. Honors in Molecular & Cellular Biology, Computer Science, GPA 3.962

Thesis: “Multi-task learning of Bayesian networks identifies causal proteins in neurodegenerative diseases”

**Honors:** Abramson Fellowship; Pechet Award; John Harvard Scholar; Detur Prize

**Relevant Coursework:** Life Sciences I & II; Organic Chemistry; Organic Chemistry of Life; Inorganic Chemistry; Biochemistry and Molecular Medicine; Human Energetics; Cell Biology; Intro to Computer Science; Statistics; Data Science; Computer Networks; Intro to Computational Biology & Bioinformatics; Multivariable Calculus; Linear Algebra & Differential Equations; Intro to Quantitative Methods; Mechanics; Electromagnetism and Statistical Physics; Research in Biomechanics & Physiology; Expository Writing I & II; Biochemical Sciences Tutorial

**Lincoln Sudbury Regional High School** May 2015, Sudbury

GPA 4.00, SAT 2370; National Merit Scholar; Arnold Science, Bausch + Lomb Science; Superintendents Awards

**EXPERIENCE**

**Massachusetts Institute of Technology** Jan 2019-Present, Cambridge

**Undergraduate Assistant/ Fraenkel Lab, Dept of Biological Engineering**

* Used multi-task learning of directed acyclic graphs to determine causal protein hubs in neurodegeneration
* Identify differential phosphopeptides in glioblastoma subtypes after dasatinib treatment

**Harvard University**

**Undergraduate Assistant/ Lieberman Lab, Dept of Human Evolutionary Biology** Jan 2019-Present, Cambridge

* Measured and analyzed energetic and biomechanical costs in humans walking with and without heel-strike

**Massachusetts Eye and Ear Infirmary** Jun 2014-Present, Boston

**Study Coordinator and Research Assistant/ Glaucoma Dept**

* Current: Analyze GWAS summary statistics and functional genomic annotations with linkage disequilibrium score regression (coauthored manuscript in *Am J Ophthalmol)*; Use machine learning (TensorFlow) for classification of nailfold capillary images (invited oral presentation at Think Tank); Assess peripheral vasculature in soluble guanylate cyclase knockout mice; Analyze densitometry and geometric profiles in glaucoma disc hemorrhages in collaboration with the Ocular Hypertension Treatment Study
* Past: Recruited and examined over 400 patients and analyzed nailfold capillary imaging for morphological changes between different types of glaucoma subjects and controls; Designed protocol for densitometry and geometric analysis of disc hemorrhage in primary open-angle glaucoma, retinal vein occlusions, and retinal macroaneurysms; Liaison between IRB and research collaborators at other institutions; First authored manuscripts in *Eye* and *Br J Ophthalmol;* Coauthored manuscripts in *IOVS* and *Am J Ophthalmol;* Invited for oral presentations at World Ophthalmology Congress in Barcelona and at Asian-Pacific Academy of Ophthalmologists in Bangkok (based on highest ranked abstract at AGS 2019)

**Research Assistant/ Howe Laboratory** June 2013-Aug 2013, Boston

* Collected baseline and five year follow up data on POAG progression for CDKN2B-AS rs3217992 variant

**Boston University** Jul 2012-Aug 2012; Sep 2015-Oct 2018, Boston

**Clinical Research Assistant/ Alzheimer’s and Traumatic Encephalopathy Center**

* Investigated nailfold capillary abnormalities in Alzheimer’s disease and mild cognitive impairment. Posters and first authored manuscript in *J Alzheimers Dis*.
* Scored written neuropsychology tests; organized data for studies of neurological disease and injury

**SKILLS**

**Lab:** PCR, Western blot, gel electrophoresis, nailfold microscopy, murine retinal dissection, respirometry.

**Other:** Python, TensorFlow, Matlab, Shell scripting, C, HTML, CSS, SQL, ImageJ, Mathematica, R, JMP, StatPlus.

**EXTRACURRICULAR**

Harvard Varsity Skiing (Cross-Country; Co-Captain); Harvard Crimson EMS (EMT-B); Wilderness First Aid; Nordic Coach at Skiku and YES (youth skiing); AMC Trip Leader; STAT115/215 Course Assistant; Ad hoc reviewer for *Alz Dement (Amst)*, *JAND*