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# ROBIN AGUILAR

3720 15th Ave NE ◊ Seattle, WA 98105, USA

(760) · 269 · 6858 ◊ eaguil@uw.edu ◊ [Linkedin](#) ◊ [Github](#) ◊ [Portfolio](#)

## EDUCATION

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### University of Washington Seattle

*September 2018 - Present*

Ph.D. in Genome Sciences

National Science Foundation Graduate Research Program Fellow

### DePauw University

*May 2018*

B.S. in Biochemistry

Minors in Computer Science and Spanish

Magna Cum Laude · Science Research Fellow · Bonner Civic Engagement Scholar · Phi Beta Kappa

## RESEARCH EXPERIENCE

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### Doctoral Student

June 2019 - Present

*Department of Genome Sciences*

*Seattle, WA*

Advisors: Dr. Brian J. Beliveau and Dr. William Stafford Noble

Developing software tools to design oligonucleotide probes to visualize satellite DNA using fluorescence *in situ* hybridization techniques and advanced microscopy. These tools will be used to uncover the organizational role of satellite DNA in human and model organism genomes to better understand their role in human health and disease.

### Rotation Student

September 2018 - December 2018

*Department of Genome Sciences*

*Seattle, WA*

Advisor: Dr. Kelley Harris

Conducted analyses to uncover selection against archaic DNA in human regulatory regions. It was demonstrated that Neanderthal and Denisovan alleles likely dysregulated gene expression in specific human tissues, causing systematic depletion of archaic introgression from enhancer regions annotated by the ENCODE project.

### Undergraduate Research Assistant

April 2015 - May 2018

*DePauw University*

*Greencastle, IN*

Advisor: Dr. Daniel Gurnon

Developed bioinformatics pipelines to identify novel protein variants and crystal structures in collaboration with the Rare Genomics Institute. Implemented bioinformatic workflows to identify causal variants from exomic data in patients with rare genetic diseases.

### Undergraduate Summer Intern

June 2017 - August 2017

*Department of Genome Sciences*

*Seattle, WA*

Advisor: Dr. Jay Shendure

Implemented computational approaches to study homolog pairing and 3D genome organization in diploid hybrid yeast.

### Visiting Undergraduate Research Student

September 2016 - December 2016

*University of Geneva*

*Geneva, Switzerland*

Advisor: Dr. Marie Cohen

Investigated cell signaling pathways mediated by GRP78 and additional tumor growth factors using molecular biology techniques (PCR, western blot, southern blot, FISH) and performed computational protein modeling on GRP78.

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**Undergraduate Summer Intern***Stanford University*

June 2016 - August 2016

*Palo Alto, CA*

Advisor: Dr. Michele Calos

Investigated a novel gene therapy treatment method for Duchenne Muscular Dystrophy using intravenous plasmid DNA administration in a disease mouse model. Performed molecular biology techniques including PCR, western blot, IHC, and tissue culture.

**Undergraduate Research Assistant***DePauw University*

June 2015 - December 2015

*Greencastle, IN*

Advisor: Dr. Melissa Petreaca

Studied the effects of LIGHT/TNFSF14 gene on the activation of reactive oxygen species and the formation of neutrophil extracellular traps. Utilized assay techniques such as PCR and immunofluorescence to quantify and analyze cell survival.

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**PUBLICATIONS**

Telis, N., **Aguilar, R.**, Harris, K. (2019). Selection against archaic DNA in human regulatory regions. *Nature Ecology and Evolution*, 708230.

Bastida-Ruiz, D., **Aguilar, E.**, Ditisheim, A., Yart, L., Cohen, M. (2017). Endoplasmic reticulum stress responses in placentation-A true balancing act. *Placenta*, 57, 163-169.

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**SELECTED SEMINAR PRESENTATIONS**

**T2T / HPRC Towards a Complete Reference of Human Genome Diversity** September 2020  
*T2T/HPRC* *Remote*

- Tigerfish: A tool for designing oligo probes against satellite DNA genome wide

**Coming Together Weekend** November 2019  
*DePauw University* *Greencastle, IN*

- On becoming a scientist and activist in graduate school: Opportunities and stories of resilience.

**SACNAS National Conference** October 2019  
*Hawaii Convention Center* *Honolulu, HI*

- Computational approaches for oligonucleotide probe design and visualizing satellite DNA

**Pairing Meeting** October 2019  
*Cleveland Clinic Cancer Center* *Cleveland, OH*

- Visualizing Repetitive DNA with Oligonucleotides

**EuroScholars Research Symposium** November 2016  
*University of Helsinki* *Helsinki, Finland*

- Endoplasmic reticulum stress response in placentation

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**SELECTED POSTER PRESENTATIONS**

**T2T / HPRC Towards a Complete Reference of Human Genome Diversity** September 2020  
*T2T/HPRC* *Remote*

**Robin Aguilar\***, Brian J. Beliveau, William Stafford Noble, "Tigerfish: A tool for designing oligo probes against satellite DNA genome wide"

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**International Conference on Intelligent Systems for Molecular Biology**  
*ISMB*

July 2020  
*Remote*

**Robin Aguilar\***, Brian J. Beliveau, William Stafford Noble, “Tigerfish: A tool for designing oligo probes against satellite DNA genome wide” **Awarded Best Poster in Computational Biology Division**

**American Society for Human Genetics Conference**  
*Houston Convention Center*

October 2019  
*Houston, TX*

**Robin Aguilar\***, Dr. Brian J. Beliveau, Dr. William Stafford Noble, “Tigerfish: A tool for designing oligo probes against satellite DNA genome wide”, ASHG National Conference.

**Genome Sciences Summer Research Symposium**  
*Department of Genome Sciences*

August 2017  
*Seattle, WA*

**Robin Aguilar\***, Seungsoo Kim, and Dr. Jay Shendure, “Computational Analysis of Diploid Yeast Genome Organization”, University of Washington Summer Undergraduate Research Symposium.

**Stanford Summer Research Symposium**  
*Stanford University*

August 2016  
*Palo Alto, CA*

**Robin Aguilar**, Mital Bhakta, and Dr. Michele Calos, “Delivery of Naked Plasmid DNA as a Gene Therapy Approach in a Murine Muscular Dystrophy Model”, Stanford Summer Research Program.

**Experimental Biology Conference**  
*San Diego Convention Center*

April 2016  
*San Diego, CA*

Brady Tucker, **Robin Aguilar**, and Dr. Daniel Gurnon, “Non-Profit Patient Research Services Enable Insight into Rare Diseases and Cloud Collaboration”, Experimental Biology Conference.

**Indiana Physiology Society**  
*DePauw University*

February 2016  
*Greencastle, IN*

**Robin Aguilar**, Brady Tucker, and Dr. Daniel Gurnon, “Utilization of Bioinformatic Pipelines to Provide Personalized Treatment to Rare Genetic Disease Patients”, Indiana Physiological Society Meeting.

**Science Research Fellows Symposium**  
*DePauw University*

July 2015  
*Greencastle, IN*

**Robin Aguilar**, Brady Tucker, and Dr. Daniel Gurnon, “Discovering Causative Variants of Rare Diseases using DNA Sequencing and Big Data Analysis”, Science Research Fellows Symposium, DePauw University.

## OUTREACH

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### **President and Founder of GSAIMS**

January 2019 - Present  
*Seattle, WA*

*Genome Sciences Association for the Inclusion of Minority Students (GSAIMS)*

- Organize events open to all department members that center identity and inclusive programming (ex. book clubs, underrepresented minorities (URM) in STEM seminar series) while managing a departmental budget for event planning.
- Host and organize inclusive department-wide community events.
- Recruit and support URM students at national conferences (SACNAS and ABRCMS 2019) and support incoming first-year recruitment efforts.
- Facilitate and organize first-year student orientation and first-year mentorship programs.
- Collaborate with University of Washington student organizations including SACNAS and GO-MAP to organize events for URM scholars.
- Network with URM alumni to serve as a resource for current students.

- Lead GSAIMS meetings and manage organization leadership structure.
- Successfully was awarded a Seed Grant in 2019 by the UW Graduate School to host a seminar series featuring the narratives of diverse professionals in genomics and STEM careers.

**Diversity, Equity, and Inclusion Committee Student Representative** June 2020 - Present  
*Department of Genome Sciences* *Seattle, WA*

- Developed content to build a Diversity, Inclusion, and Equity homepage on the Genome Sciences web page.
- Contributed toward curriculum development to include topics intersecting with anti-racism, diversity, and equity that could be implemented in specialized courses and department wide for seminars and retreats.
- Organized resources to develop and implement department wide climate survey.
- Created guidelines toward improving inclusive practices and climate at student-led research reports and seminars.
- Successfully implemented strategies at department-wide events to ensure that gender-affirming pronoun usage is required for all department members.

**Mentorship Program Coordinator** August 2019 - June 2020  
*Department of Genome Sciences* *Seattle, WA*

- Partnered incoming first-year graduate students and faculty with diverse graduate students from diverse backgrounds to assist with mentorship and the transition into graduate school (forty participants total).
- Created mentor profiles and provide training to student mentors.
- Organized quarterly check-in events and socials.

**Genome Hackers Facilitator** August 2019  
*Department of Genome Sciences* *Seattle, WA*

- Facilitate lesson plans to teach a classroom of fifteen participants with different levels of coding experience for a summer in genomics immersion experience

**Website Developer and Social Media Specialist** September 2017 - May 2018  
*Putnam Pride Initiative* *Greencastle, IN*

- Developer of local non-profit website that contains LGBTQ+ advocacy resources which provides a medium for communication between executive team members and individuals in Putnam County
- Promoted events and obtained sponsors from local donors to support LGBTQ+ youth
- Liason for co-sponsorship events in collaboration with DePauw LGBTQ+ organizations

**Co-Chair and Leadership Coordinator** September 2017 - May 2018  
*Association for Women in Computing* *Greencastle, IN*

- Host bi-monthly meetings with professors in computer science to plan events for women in computer science at DePauw University
- Coordinate student leadership projects and created mentorship network for underclassmen
- Host panels to aid students in scholarship process for Grace Hopper Conference

**Bonner Scholar Senior Intern** September 2017 - May 2018  
*Bonner Scholars Program, DePauw University* *Greencastle, IN*

- Plan Senior Symposium, aid with Bonner admissions process, and help senior students prepare presentations for senior symposium

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**Reflections Leader***DePauw University Winter Term in Service*

November 2016 - January 2017

*Zacataloza, Nicaragua*

- Led discussions regarding identity, civic engagement, and facilitating community dialogue while residing in homestays in Zacataloza, Nicaragua.
- Coordinator of winter term re-immersion program for incoming students to discuss their experiences abroad
- All student participants continued their service abroad as local philanthropic leaders or volunteers in Greencastle or through the Hartman House

**Youth Mentor***Live Out*

September 2016 - December 2016

*Geneva, Switzerland*

- Aid LGBTQ+ youth through mentorship (homework help, interpersonal dialogue) and support outside of their home. Participate in weekly meetings with other mentors to plan programming and youth for mentees.

**STEM Middle School Mentor***Greencastle Middle School*

September 2015 - December 2017

*Greencastle, IN*

- Assisted with an after-school tutoring program to aid students needing guidance in STEM areas. Mentored over five students and improved their grades from B's to A's. Assisted with teaching student labs, helped prepare students for science lessons, and provided mentorship to students in the classroom

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**TEACHING EXPERIENCE****Advanced Bioinformatics and Genomics***DePauw University*

January 2018 - May 2018

*Greencastle, IN*

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**FELLOWSHIPS****NSF GRFP Fellow***DePauw University*

May 2018 - Present

*Greencastle, IN***Fulbright Research Fellow Semi-Finalist***DePauw University*

January 2018

*Greencastle, IN***Goldwater Scholar***DePauw University*

March 2017

*Greencastle, IN*

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**AWARDS AND HONORS****Phi Beta Kappa***DePauw University*

2018

*Greencastle, IN***Sigma Delta Pi***DePauw University*

2018

*Greencastle, IN*

National collegiate Hispanic honor society

**Elizabeth Sue Kerr Memorial Scholar***DePauw University*

2017

*Greencastle, IN*

Given to students who have participated in Winter Term in Service or have demonstrated a significant commitment to community service.

**Martha Weddell Nicholson Endowed Scholarship***DePauw University*

2017

*Greencastle, IN*

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Given to a student pursuing biomedical research who has demonstrated academic excellence, integrity, and has shown leadership commitment.

**Grace Hopper Scholar**

*DePauw University*

2016

*Greencastle, IN*

Given to outstanding women making an impact in computer science research and are invited to the three day Grace Hopper Celebration in Orlando, Florida.

**Howard C. and Mary Ellen Black Scholar**

*DePauw University*

2016

*Greencastle, IN*

Provides scholarship support for highly gifted students enrolled in any one of the honors programs who are majoring in chemistry or biochemistry.

**Goldwater Scholar - Honorable Mention**

*DePauw University*

2016

*Greencastle, IN*

Demonstrates academic excellence, commitment, and contribution to research as an undergraduate student desiring to pursue a Ph.D. in the sciences

**Percy Lavon Julian Scholar Award**

*DePauw University*

2015

*Greencastle, IN*

An award presented by the biochemistry department to one student who has demonstrated a desire to pursue research, academic achievement, and commitment to civic engagement

**American Chemical Society Scholar**

*DePauw University*

2014

*Greencastle, IN*

Awarded to students considered to be underrepresented in the sciences who have demonstrated excellence in science, leadership, and service

**Presidential Scholar for Academic Excellence**

*DePauw University*

2014

*Greencastle, IN*

The highest academic scholarship awarded to incoming students at DePauw University.

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**PROFESSIONAL MEMBERSHIPS**

**Society for the Advancement of Chicanos and Native Americans in STEM**

*University of Washington*

2019 - Present

*Seattle, WA*

**American Society for Human Genetics**

*University of Washington*

2019 - Present

*Seattle, WA*

**American Chemical Society**

*DePauw University*

2014 - 2018

*Greencastle, IN*

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**COMPUTATIONAL SKILLS**

**Computer Languages**

Python, C/C++, R, Java, Jupyter

**Protocols & APIs**

XML, JSON

**Databases**

MySQL, PostgreSQL, Microsoft SQL

**Tools**

SVN, Vim, Emacs

**Illustration**

Adobe Suites, Clip Studio Paint