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# ROBIN AGUILAR

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## EDUCATION

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### University of Washington Seattle

September 2018 - Present

Ph.D. in Genome Sciences

National Science Foundation Graduate Research Program Fellow and HHMI Gilliam 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**

**Aguilar, R.**, et al. "Tigerfish designs oligonucleotide-based in situ hybridization probes targeting intervals of highly repetitive DNA at the scale of genomes." *bioRxiv* (2023).

**Aguilar, R.**, From Canvases to Microscopes: Building Uplifting Community and Research Spaces Within and Beyond Genomics. *ACS Chemical Biology* 10.1021 (2022).

**Aguilar, R.**, Breaking the binary by coming out as a trans scientist. *Nature* 591.7849 (2021): 334-335.

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****Guest Speaker***MIT Whitehead Institute*

May 2023

*Cambridge, MA*

- Invited guest speaker on diversity and equity specific to Trans and LGBTQ+ aspirations in STEM.

**Keynote Speaker***SUPERB Scholarship Program*

August 2022

*Counce, TN*

- Keynote and panelist on diversity and equity in STEM.

**Gender Diversity in STEM Panel***Australasian Conference of Undergraduate Research*

September 2021

*Remote*

- Gender Diversity in STEM Panelist

**Reclaiming STEM Meeting***Reclaiming STEM*

August 2021

*Remote*

- Curating Your Narrative: Navigating Mindful Storytelling Within and Beyond Academic Spaces

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

September 2020

*Remote*

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

**Coming Together Weekend***DePauw University*

November 2019

*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

## SELECTED POSTER PRESENTATIONS

**Deconstructing the Genome** May 2022  
*HHMI* *Remote*

**Robin Aguilar\***, Brian J. Beliveau, William Stafford Noble, “Tigerfish—An efficient workflow for the design of oligonucleotide in situ hybridization probes to visualize satellite DNA”

**Biology of Genomes** May 2021  
*CSHL* *Remote*

**Robin Aguilar\***, Brian J. Beliveau, William Stafford Noble, “Tigerfish—An efficient workflow for the design of oligonucleotide in situ hybridization probes to visualize satellite DNA”

**Biological Data Science Meeting - Cold Spring Harbor Labs** November 2020  
*CSHL* *Remote*

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

**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”

**International Conference on Intelligent Systems for Molecular Biology** July 2020  
*ISMB* *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** October 2019  
*Houston Convention Center* *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** August 2017  
*Department of Genome Sciences* *Seattle, WA*

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

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**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.

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**OUTREACH****Founder and Lead Editor***Transcriptions Art Zine*

January 2021 - Present

*Seattle, WA*

- Organize and edit Transcriptions Art Zine - A zine centered on featuring the voices of transgender and gender nonconforming scientists internationally.

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

January 2019 - Present

*Seattle, WA*

- 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.

**Mentorship Program Coordinator***Department of Genome Sciences*

August 2019 - June 2020

*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**

*Department of Genome Sciences*

August 2019

*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**

*Putnam Pride Initiative*

September 2017 - May 2018

*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**

*Association for Women in Computing*

September 2017 - May 2018

*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**

*Bonner Scholars Program, DePauw University*

September 2017 - May 2018

*Greencastle, IN*

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

### **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

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<b>Intro to Python Programming</b> <i>University of Washington Department of Genome Sciences</i>	January 2021 - March 2021 <i>Seattle, WA</i>
<b>Introductory Genetics</b> <i>University of Washington Department of Genome Sciences</i>	January 2021 - March 2021 <i>Seattle, WA</i>
<b>Advanced Bioinformatics and Genomics</b> <i>DePauw University</i>	January 2018 - May 2018 <i>Greencastle, IN</i>

## FELLOWSHIPS

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<b>HHMI Gilliam Fellow</b> <i>University of Washington</i>	July 2021 - Present <i>Seattle, WA</i>
<b>NSF GRFP Fellow</b> <i>DePauw University</i>	May 2018 - Present <i>Greencastle, IN</i>
<b>Fulbright Research Fellow Semi-Finalist</b> <i>DePauw University</i>	January 2018 <i>Greencastle, IN</i>
<b>Goldwater Scholar</b> <i>DePauw University</i>	March 2017 <i>Greencastle, IN</i>

## AWARDS AND HONORS

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<b>Phi Beta Kappa</b> <i>DePauw University</i>	2018 <i>Greencastle, IN</i>
<b>Sigma Delta Pi</b> <i>DePauw University</i>	2018 <i>Greencastle, IN</i>
National collegiate Hispanic honor society	
<b>Elizabeth Sue Kerr Memorial Scholar</b> <i>DePauw University</i>	2017 <i>Greencastle, IN</i>
Given to students who have participated in Winter Term in Service or have demonstrated a significant commitment to community service.	
<b>Martha Weddell Nicholson Endowed Scholarship</b> <i>DePauw University</i>	2017 <i>Greencastle, IN</i>
Given to a student pursuing biomedical research who has demonstrated academic excellence, integrity, and has shown leadership commitment.	
<b>Grace Hopper Scholar</b> <i>DePauw University</i>	2016 <i>Greencastle, IN</i>
Given to outstanding women making an impact in computer science research and are invited to the three day Grace Hopper Celebration in Orlando, Florida.	
<b>Howard C. and Mary Ellen Black Scholar</b> <i>DePauw University</i>	2016 <i>Greencastle, IN</i>
Provides scholarship support for highly gifted students enrolled in any one of the honors programs who are majoring in chemistry or biochemistry.	

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**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*

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**COMPUTATIONAL SKILLS**

<b>Computer Languages</b>	Python, C/C++, R, Java, Jupyter
<b>Protocols &amp; APIs</b>	XML, JSON
<b>Databases</b>	MySQL, PostgreSQL, Microsoft SQL
<b>Tools</b>	SVN, Vim, Emacs
<b>Illustration</b>	Adobe Suites, Clip Studio Paint, Procreate