



# **iGEM 2020**

# **Recruitment**

# Attendance

Fill out this survey so you can be added to our email list:

<https://tinyurl.com/u2sqaom>

# Agenda

- What is iGEM?
  - What is synthetic biology?
  - How does iGEM fit in?
- iGEM Basics
  - Past projects
  - What does the process look like?
- Competition
- Subteams
- Recruitment
- Q & A



attendance:

<https://tinyurl.com/sqlhrym>

# What is iGEM?

iGEM is an **international competition** for synthetic biology. Teams from around the world create, develop, and present projects to a panel of synthetic biology experts.



# Synthetic biology

Synthetic Biology is a novel field of biology that uses genetic engineering to redesign organisms for useful purposes.



# Washington iGEM

This season, our team is prioritizing competitiveness, previous experience, and dedication to our work in our team selection process.



attendance:  
<https://tinyurl.com/sqlhrym>

# iGEM is interdisciplinary!

A variety of majors have participated with us, both intended and declared!

**Biochemistry**

**Physics**

**Bioengineering**

**Business Administration**

**Informatics**

**Disability Studies**

**Computer Science**

**Education**

**Electrical Engineering**

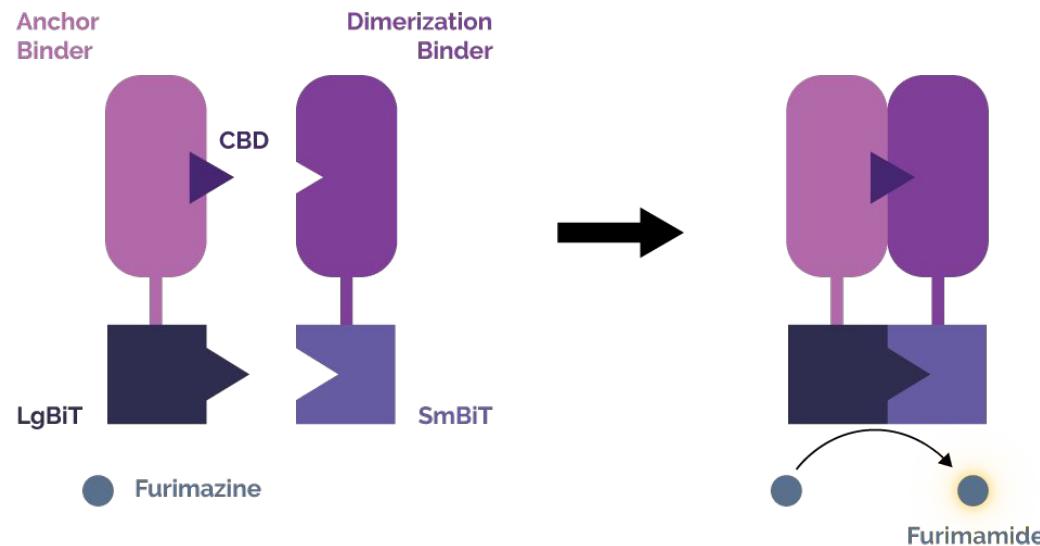
**...and more!**

attendance:

<https://tinyurl.com/sqlhrym>

# Immunosense: Washington 2019

- An antibody-based biosensor for small molecules
- See 2019 wiki for more details



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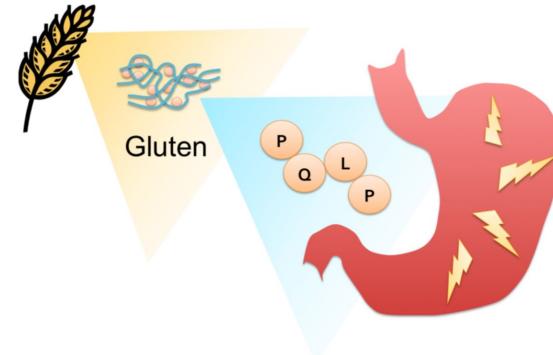
<https://tinyurl.com/sqlhrym>

# Make it or Break it: Washington 2011

- **Break it: Gluten Breakdown**
- Won 2011 iGEM Grand Prize
- Spun-off into company for celiac therapeutic
  - In Phase 1 Clinical Trials with \$35M funding!



PVP BIOLOGICS



attendance:

<https://tinyurl.com/sqlhrym>

# Season progression

**Spring:** project development, team building, training

**Summer:** bulk of research and work

**Fall:** finalizing project, presentation development, and flying to Boston



# Jamboree



- International synthetic biology competition held each year in October
- Usually falls in the **middle of fall quarter** (around midterm season)
  - Professors have been very accommodating in the past
- Present our project to judges as well as other teams
- Opportunity for networking with entrepreneurs in synthetic biology

attendance:

<https://tinyurl.com/sqlhrym>

# Costs



Jamboree Registration: ~\$700

Airfare: ~\$300

Hotel / Airbnb Stay: + ~\$100

**Total Cost:** ~\$1100

*Attending jamboree is **not** mandatory for team members.*

# Financial aid for jamboree



## URP Conference Grant:

Every member is eligible to apply!

Also gives you the chance to present at the Undergraduate Research Symposium

## HUB Travel Grant:

\$1500 that iGEM applies for

**Together: ~\$250-300 of travel grant per person**

attendance:

<https://tinyurl.com/sqlhrym>

# Student responsibilities

## time availability

spring: 5-10 hrs/week

summer: 15-20 hrs/week (wetlab and simulations  
must be in Seattle)

fall: 15-20 hrs/week  
(may differ for web dev subteam)

## ability to work in a fast-paced team environment

contribute your ideas

## willingness to learn and participate

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<https://tinyurl.com/sqlhrym>



# Parts of the team

There are many different subteams that work together in the bigger iGEM team, each focused on a different aspect of the project.

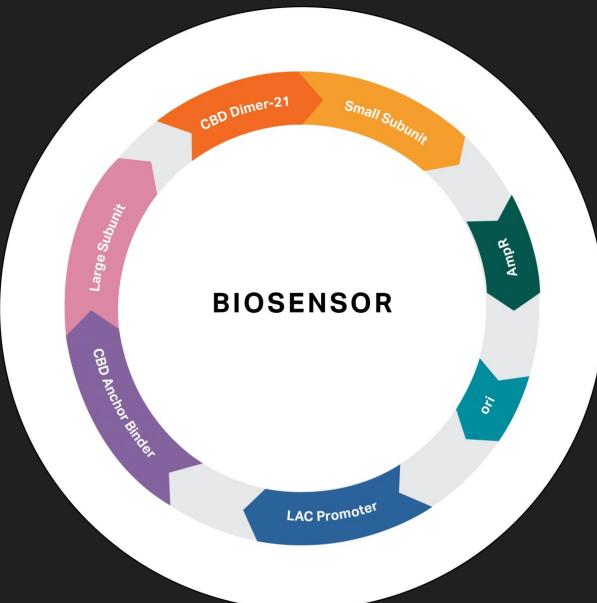
There are opportunities for **anyone** who wants to be a part of the team.

web  
development  
design  
**wetlab**    **fundraising**  
**project**  
**business**    **drylab**  
**collaborations**    **human**  
                            **practices**

# Wetlab



# What do we do?



**change DNA on a molecular level to  
express the proteins we want**

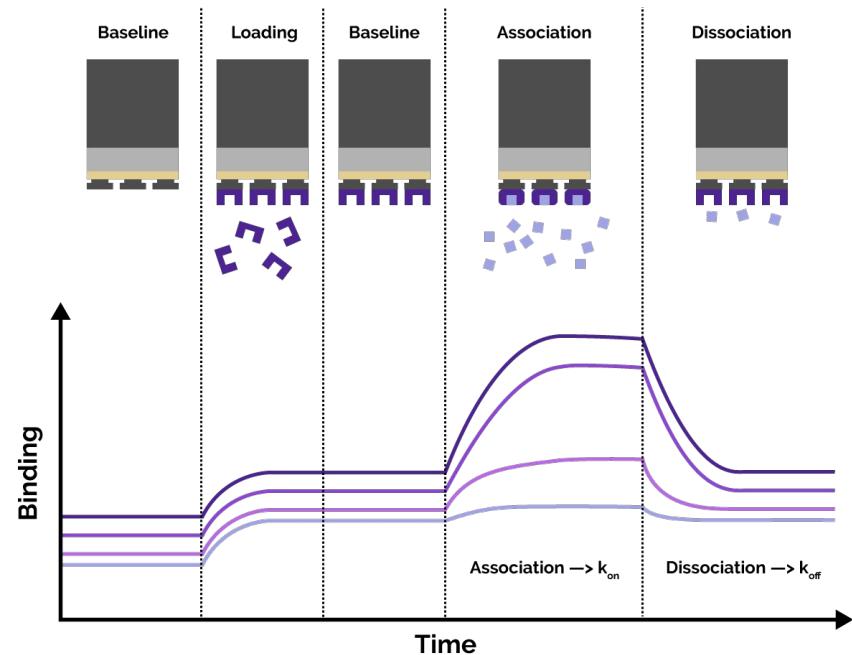
**research outside of lab**

Find relevant papers or new procedures

**molecular biology techniques**

**design and construct BioBricks**

# Who are we looking for?



**experience preferred, but not required**

previous lab experience (research labs, classes, etc)

**time commitment**

**persistence and initiative**

things fail, but there are no successes without failures

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<https://tinyurl.com/sqlhrym>

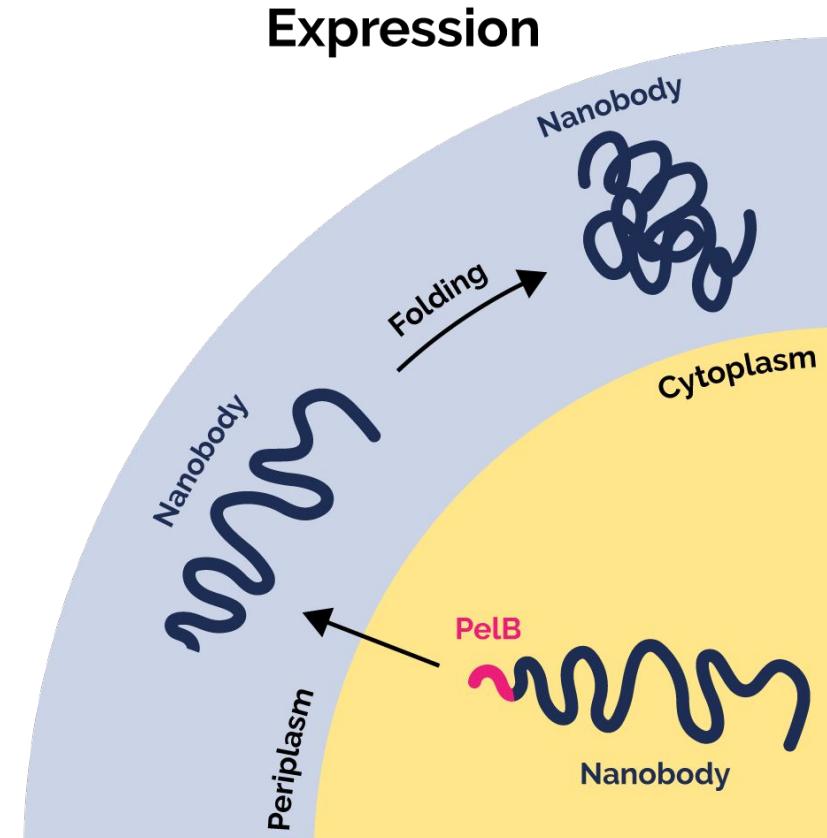
# What can we give you?

**graduate-level lab experience**

**research techniques outside lab**

interpreting data, reading papers, etc

**communication and teamwork skills**



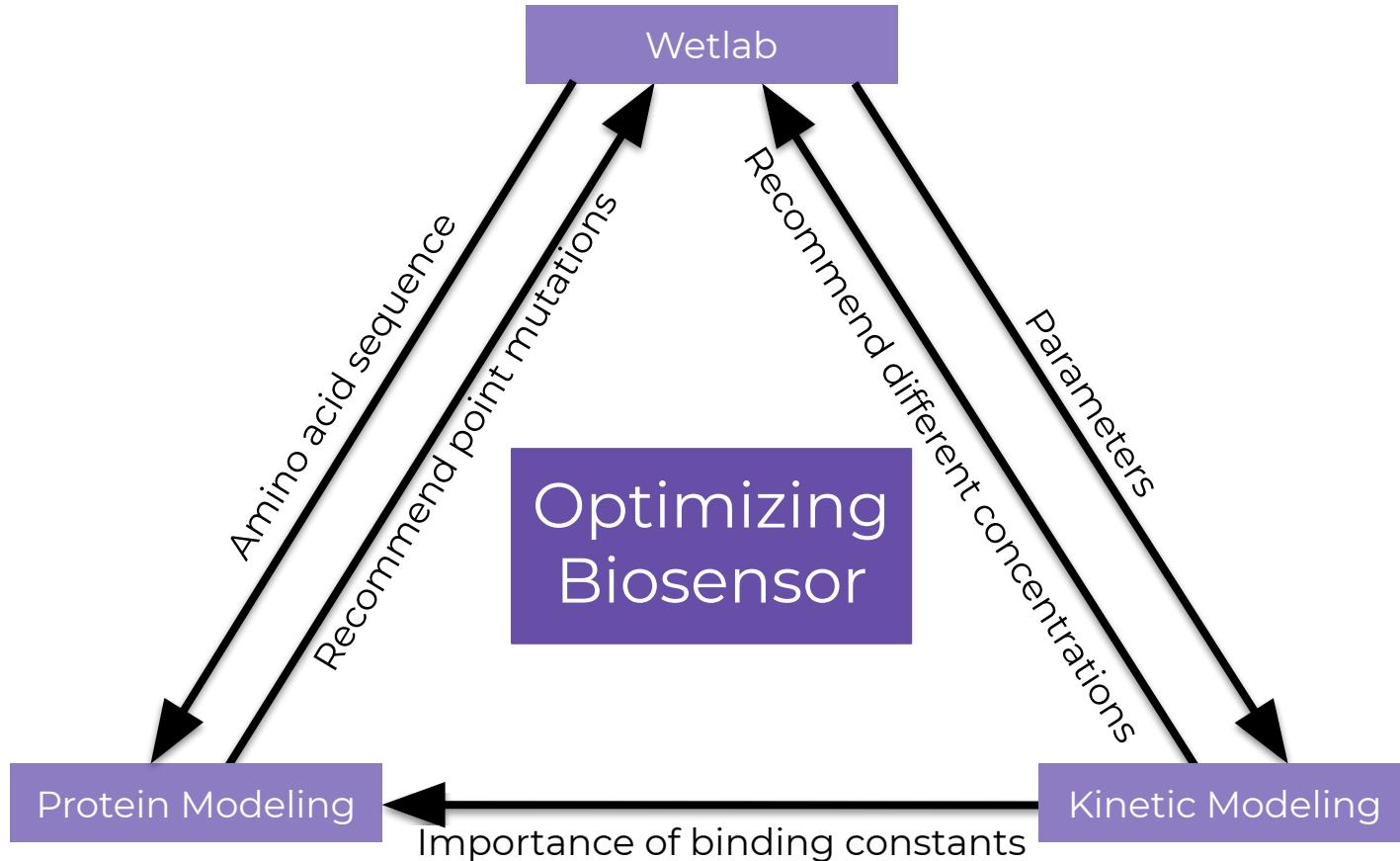
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# Simulations

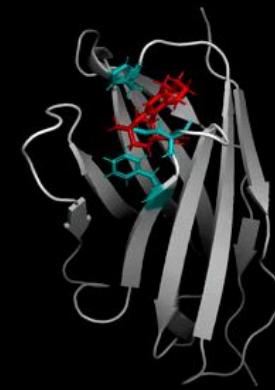
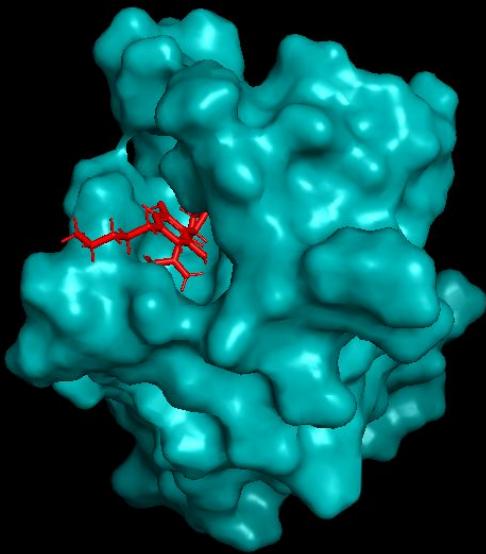
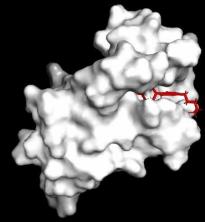


# What do we do?



attendance:

<https://tinyurl.com/sqlhrym>



# What are we looking for?

**experienced preferred, but not required**

programming

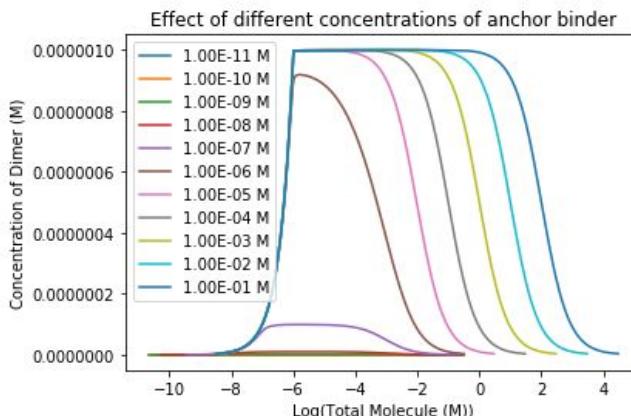
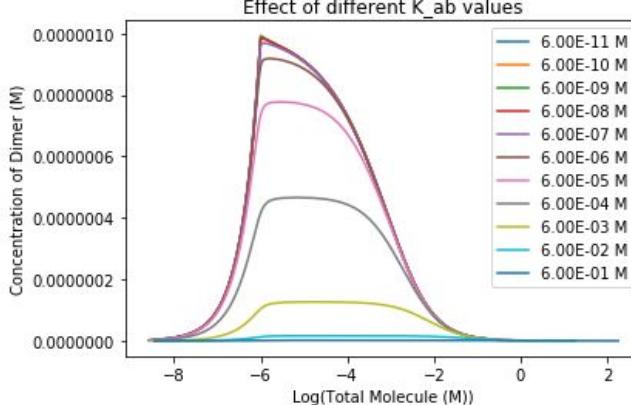
unix/git

**time commitment and motivation to learn**

**participation in other parts of the project**

outreach

other sub-teams



attendance:

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# What can we give you?

## **modeling and programming experience**

Rosetta

Tellurium

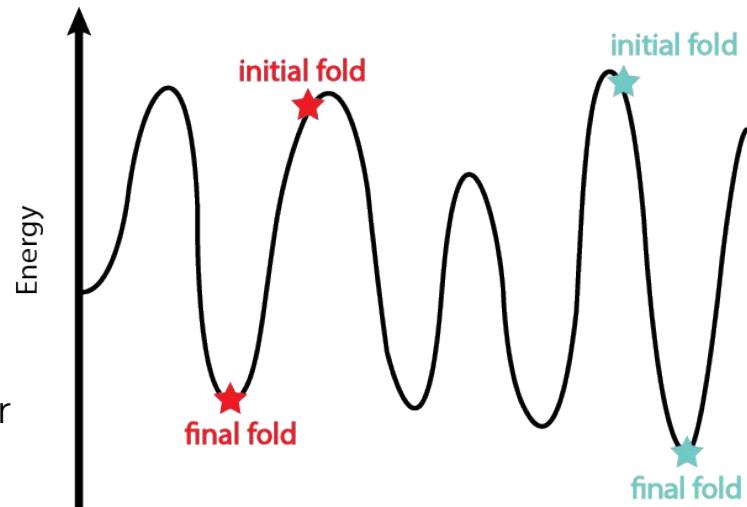
Hardware

## **leadership in UW's only undergrad-directed research**

smaller team requires more individual responsibility for members

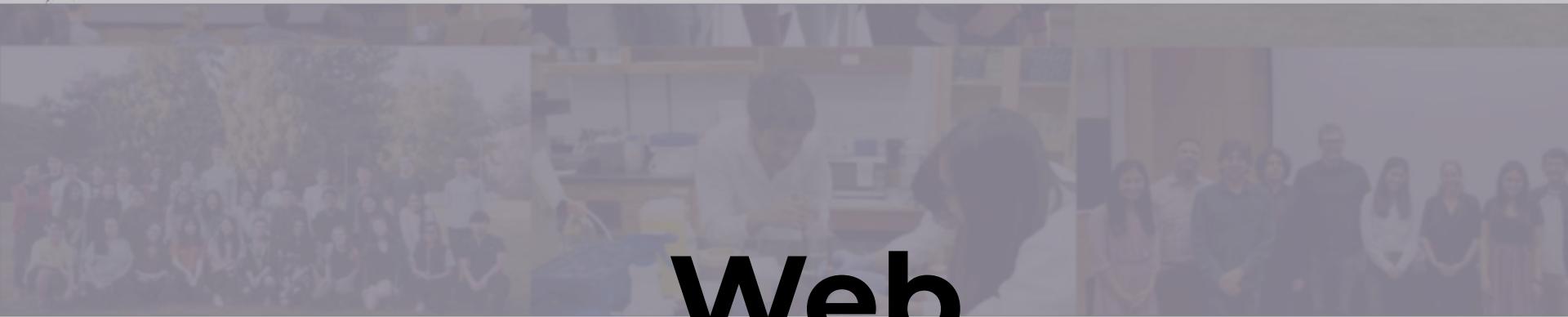
Lower energy, more accurate conformation

Higher energy, less accurate conformation



attendance:

<https://tinyurl.com/sqlhrym>



# Web Development

Detecting small molecules using a chemically-induced dimerization system.

## Welcome to Immunosense

[Project Description >](#)

## Abstract

# What do we do?

## develop project wiki

content management system

## create uwigem.com

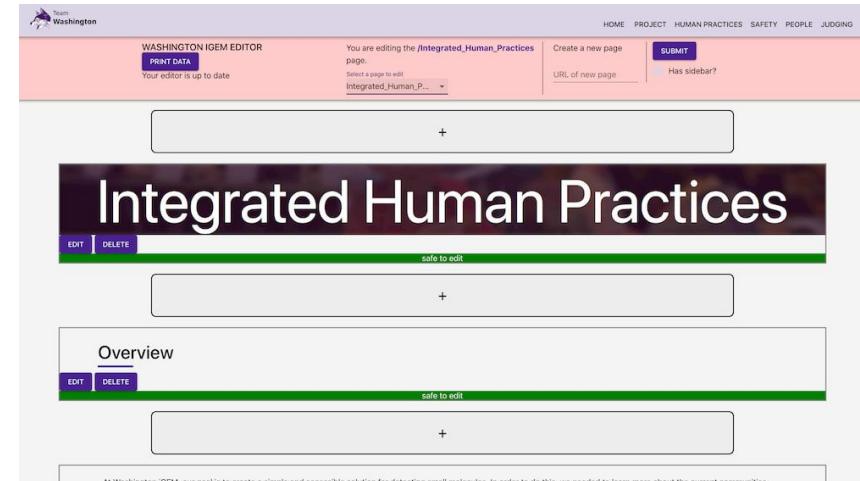
## learn and implement industry best practices

clean, consistent code

code reviews

design and iterate

well-maintained GitHub repository



# Who are we looking for?

## developers

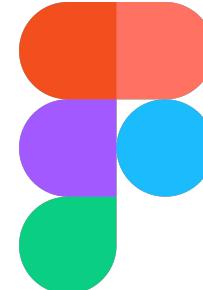
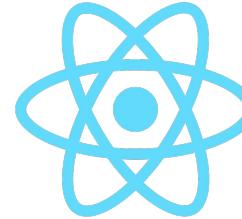
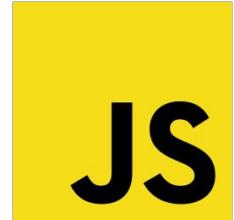
previous web development experience  
(HTML, CSS, JavaScript)

ideally completed INFO 340/ CSE 154 or  
previous experience in React

## ux designers

experience designing in Figma

some experience with HTML and CSS



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# What can we give you?

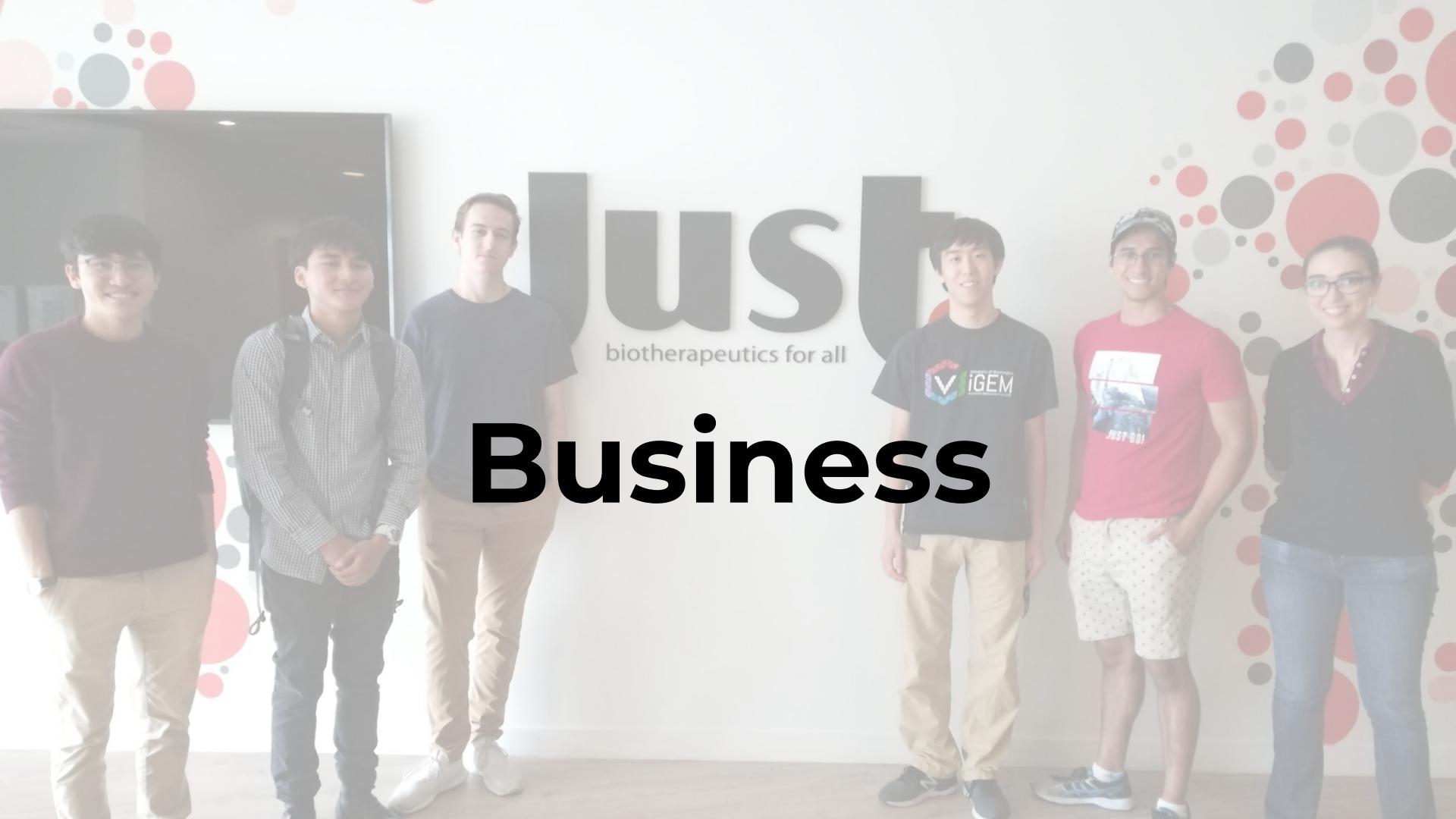


experience in a real team  
development environment (AGILE)

network of diverse  
design/developer alumni

knowledge of the most up to date  
web development technologies

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**Just**  
biotherapeutics for all

# Business

# What do we do?

**We are focused on creating a marketable product.**

- Contacting stakeholders
- Working with companies to find real world applications
  - Researching industry and market
- Helping to find funding for iGEM
- Advertising our project



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# What are we looking for?



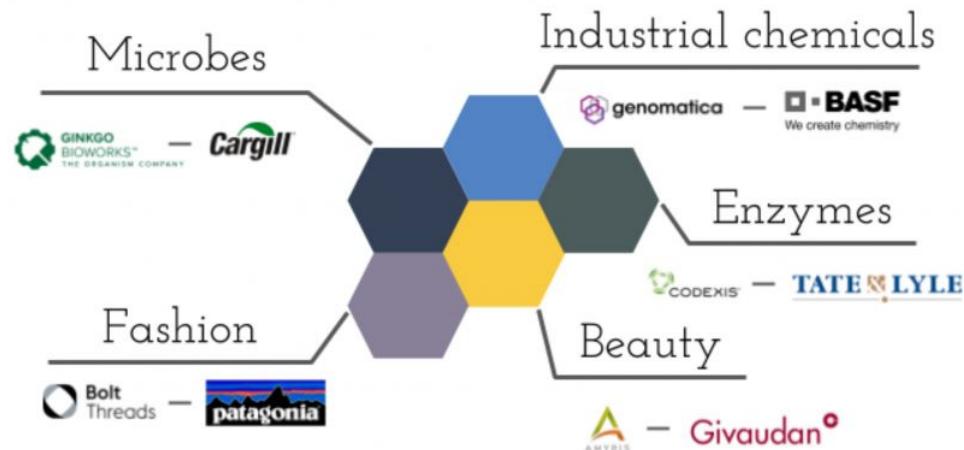
**Synthetic biology as an industry is rapidly growing as the biotech revolution takes off.**

- Help to understand our potential market and customer base
- Help fulfilling iGEM's entrepreneurship award requirements

# What can we give you?

- Experience working in a real-world business setting
- Opportunity to be in contact with large biology, chemistry, and synthetic biology companies
- Direct experience learning to relate with the biotech industry

Companies now focus on high-value products



And are getting traction with larger companies

# Outreach

A photograph of a panel discussion or outreach event. Seven scientists are seated behind a long table covered with a dark blue cloth. Each scientist has a nameplate in front of them. From left to right, the nameplates read:

- James Cech Ph.D.
- Sean Slaght Ph.D.
- Daniel Adriano Manzano S...
- Venya ...

The scientists are dressed in professional attire, including shirts, jackets, and glasses. Microphones are positioned in front of each panelist. A yellow power cord runs across the floor in front of the table. In the foreground, the back of a person's head and shoulders are visible, suggesting they are recording the event. The background shows a plain white wall and a wooden pillar on the left side of the stage.

# **What do we do?**

**create accessibility within the  
synthetic biology field**

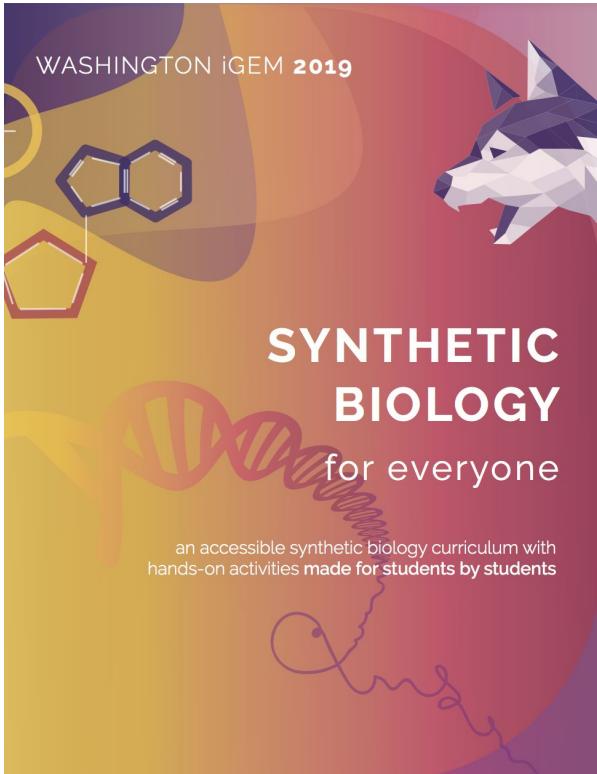
expand education to include typically  
marginalized groups

**work at a variety of events**

includes young students at school visits to  
university hosted fairs



# Accessible curriculum



Chameleon Genetics Activity  
Washington iGEM

## CHAMELEON GENETICS ACTIVITY

- Develop an understanding about how genes are passed down.
- Comprehend the difference between key phrases like heterozygous and homozygous, recessive and dominant alleles, and genotype and phenotype.
- Use Punnett Squares to predict how genes are passed down in different generations.

### LOGISTICS

- Give each student a worksheet and coin.
- Have each student complete the “Time to Make a Chameleon!” activity.
- Younger/less advanced students can stop here, as the next section is about Punnett Squares.
- Then, have students read and learn about Punnett Squares (worksheet provided) and have them pair up with another student.
- One student’s parent chameleon from the first part of the activity will be the female parent and the other will be the male parent.
- Using this information, the students can now complete the Punnett square portion of the activity and create a baby chameleon.
- Finally, as a class, share all the baby chameleon drawings.
- As a class, discuss how the activity is applicable in the real world.

### ADDITIONAL INFORMATION

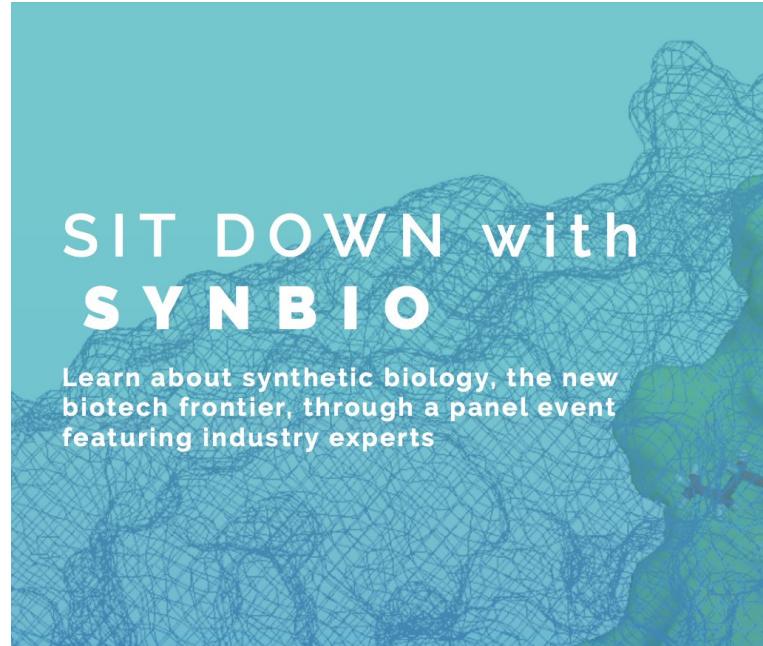
- This is an adapted version of the Dragon Genetics activity from Science Kit & Boreal Laboratories (47794).
  - Washington iGEM's version of the activity has a greater basis on genetics concepts, and all images provided are created by Washington iGEM.

### SUPPLIES/COST

- Worksheet for each student
- Colored pencils or markers
- Coin for each person
- Paper clips for each pair of students



# Public events



attendance:

<https://tinyurl.com/sqlhrym>

# Best Education & Public Engagement Award

## 2019: Washington iGEM

- 200-page accessible curriculum
  - Adapted for the visually impaired
  - Translated into 16 different languages
  - Enacted in 3 continents
- Sit Down with Synbio



# **What are we looking for**

**time commitment**

flexibility for school visits

**creativity to expand and improve  
our program**

**ability or willingness to teach  
students**

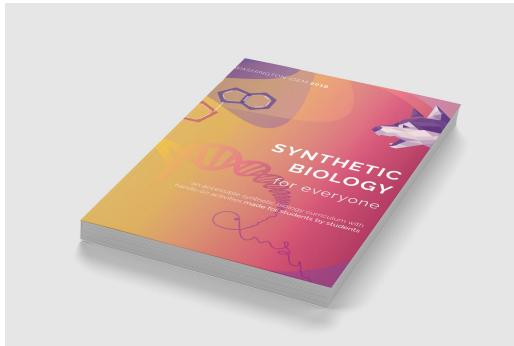


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# Structure of Outreach This Year

- Two different sides to Outreach
  - Completing last year's project
    - Overall Vision: Publish the curriculum, distribute free copies to underserved schools with a grant we have received, finish adapting the curriculum for the blind, compile translations of the entire curriculum, & eventually distribute around the world using a nonprofit model where proceeds from selling the curriculum go towards giving free copies to underserved schools.
    - This will operate as a project not directly affiliated with WA iGEM's 2020 Project.
  - New Idea



# Accessible Curriculum Roles

- All of these roles require a *minimum time commitment* of 5-6 hours/week.
  - **Translations/International Partnerships Head**
    - Will work closely with 2020 iGEM's Collaborations Lead to compile translations & have the curriculum enacted around the world
  - **Visual Impairment Adoption Head**
    - Will work closely with Ishira to adapt the curriculum for the blind & reach out to blind schools around the country. This involves *writing* curriculum.
    - Ideally has biology background & strong writing skills.
  - **External Distribution/Partnerships Head**
    - Advertise to schools across the country to distribute the curriculum
    - Work with Ishira on logistics of publishing the curriculum
  - **Graphic Design Head**
    - SUPER IMPORTANT Role; you will be acknowledged on the *published curriculum*
    - Will create illustrations for the curriculum, help create promotional materials for advertising the curriculum & Outreach events like Sit Down with Synbio
    - Can work with the Design team, but is ultimately responsible for ensuring design work is completed in a timely manner.
    - Qualification: Excellent proficiency in Adobe Illustrator
- Note: We are always looking for volunteers to come to events, so this is another way to be involved!

# 2020 Outreach Roles

- Lead a team of 4-5 people to complete this project by October 2020
  - For the 2020 project, we are looking for someone with the **next NEW amazing idea.**
    - You will be **WA iGEM's 2020 Outreach Lead.**
    - Time Commitment: Variable, but 10+ hours/week during the summer
    - Ideally have at least some biology background as the lead
  - Random Ideas
    - CS Student: Creating an accessibility platform for iGEM teams around the world to collaborate and/or a game to teach the fundamentals of synthetic biology
    - Passing legislature to make interactive science activities mandatory
- These are just quick random ideas that we came up with, but we are looking for a novel idea that has a **huge impact.**
- The 2019 project idea came from a freshman's dream, and it actually became a reality!
  - **ANYONE** can do this with perseverance
    - We will support you & give you guidance!

# Things to Keep in Mind When Thinking of Ideas

- What is iGEM looking for?



## 1. Best Education & Public Engagement

How have you developed new opportunities to include more people in shaping synthetic biology? Innovative educational tools and public engagement activities have the ability to establish a two-way dialogue with new communities by discussing public values and the science behind synthetic biology. Document your approach and what was learned by everyone involved to compete for this award.

- How is your idea novel/unique?
  - Look at teams' Wikis nominated in 2019 & past teams that won the award to make sure that your idea is unique.
- Does your idea have the ability to make a huge impact?

# What we can give you



**experience working in a learning environment**

work alongside a variety of professors, scientists, and organizations

**opportunity to see your ideas become a reality**

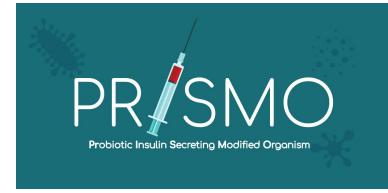
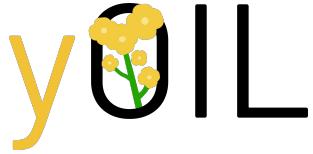
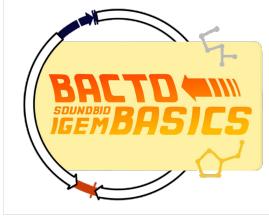
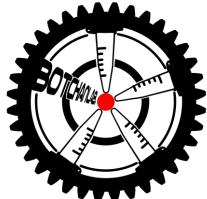
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# Collaborations



# Meaningful connections



# Increasing accessibility



# Local meetups



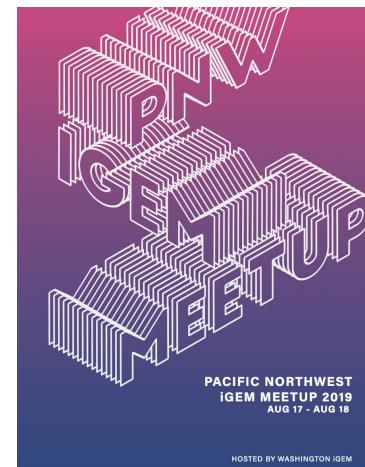
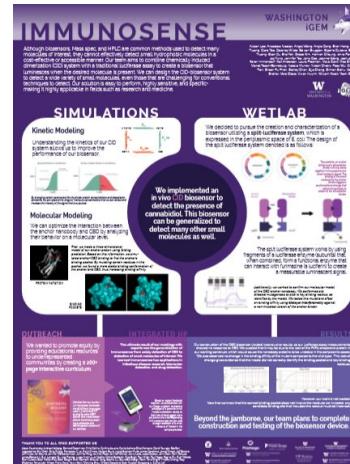
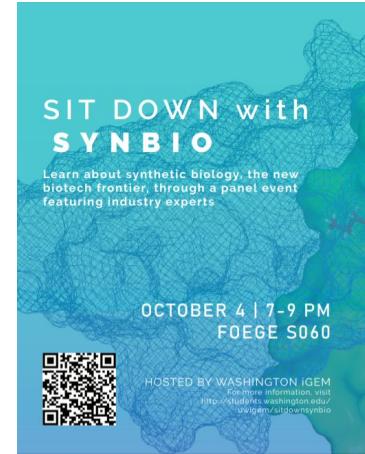
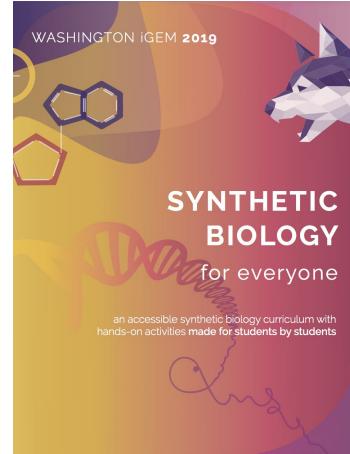
# Design

# What do we do

develop the project storyline and represent the team visually

website, presentation slides, posters, flyers, logos, animations

work collaboratively with other subteams



# What we are looking for

interest and investment

experience helpful, but not necessary

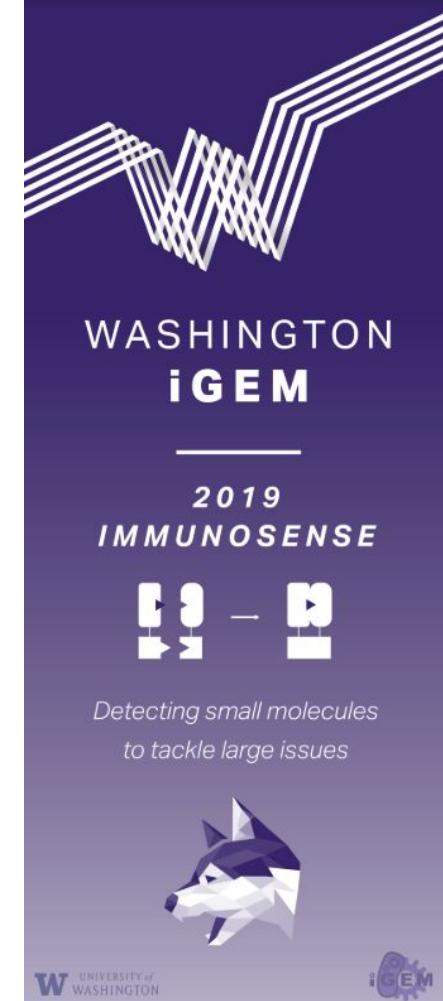
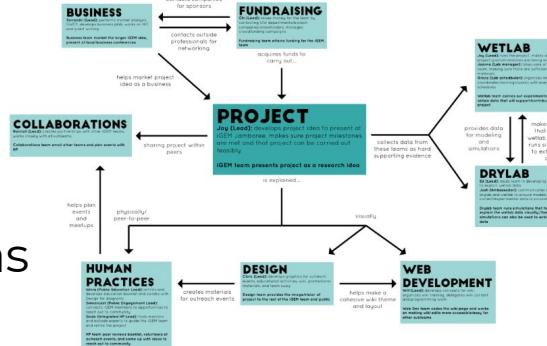


i G E M  
WASHINGTON

# What can we give you

experience with software like  
Adobe Illustrator

leadership skills and an  
opportunity to express your ideas  
and foster your creativity



# Recruitment

## **What do we want from you:**

- Fill out the following survey with some basic information and a copy of your resume
- We will be reading over and filtering your responses, however there **ARE NO** requirements to join iGEM so apply!

## **Next Steps:**

- We will be looking over your applications and hosting interviews



# Questions?

Attendance Link:

<https://tinyurl.com/sqlhrym>

Interest Survey Link:

<https://forms.gle/LPNckRjBRgxAQM5TA>