2020-2021 Chapter Development Report

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Executive Summary
The UC San Diego chapter of the Biomedical Engineering Society strives for excellence as an accessible resource for the diverse bioengineering community of the university and San Diego at large. Our aims are twofold: to provide students from all backgrounds passionate about bioengineering opportunities within the San Diego community, and to nurture a philosophy of growth where members develop together, both personally and professionally. With our twenty-one-membered Officer Board, we have endeavored to achieve these goals through offering a diverse array of programs encompassing event planning, technical/professional development, community outreach, and mentorship. Our branch eagerly connects undergraduate students hailing from various backgrounds, experiences, and professional aspirations with researchers, industry professionals, professors, department administrators, and more.

Even with the omnipresence of remote learning throughout this academic year, our charismatic and passionate members have exceeded our vision for the organization. While many traditions and potential programs were prohibited due to COVID-19 restrictions, we were able to adapt with cohesive plans and unorthodox ideas for a memorable experience. Our events were meticulously planned to maximize virtual outreach with new activities; our socials were crafted to offer both nostalgia and iconic experiences impossible without this situation. These efforts were successful in creating a supportive space in which our members could grow, have fun, learn, and struggle together, and everyone could ultimately take pride in our collective growth.

We are proud to have upheld our mission to serve the bioengineering community during these unsettling times. UCSD BMES has an unending passion for bioengineering and dedication to service which has been made even clearer by the circumstances in which we worked in, and this motivates our familial community to better serve the community at large.

Website: https://bmes.ucsd.edu/ | Photo Repository: https://tinyurl.com/ucsdbmes21
To the Student Chapter Award Committee Members,

The ever-present air of COVID-19 and the novel environment of remote learning provided the UC San Diego chapter with challenges and opportunities in our work to fulfill our mission: to provide students of all backgrounds who are passionate about bioengineering with opportunities in a supportive community environment to develop personally and professionally. This letter aims to present how the chapter has fulfilled this mission and took advantage of the unique tools of the remote format to extend our reach, both within and outside the UCSD community.

Within the UCSD community, despite the limitations of the remote environment, our large events continued to grow and bring their message to the student body. Lab Expo brought in presenters from numerous departments across campus, fostering a mentality of interdisciplinary collaboration. Translational Medicine Day expanded their efforts to educate students about the “research to recovery” pipeline of translational medicine with the inclusion of local biotechnology-based startups. Bioengineering Day celebrated the accomplishments of students, faculty, and industry and brought together nearly 600 attendees.

Our internal work continued outside of these events through our Professional development events and workshops. With collaborations between our Project Team, New Student Committee, VP External, and other officers, we were able to provide workshops on topics like computer-aided design, experimental design, and resume/interview preparation. We collaborated with other bioengineering organizations and the bioengineering department to provide opportunities to network with local industry members. Finally, we worked to extend our reach within the UCSD undergraduate community through the inclusion of a Transfer Representative on our officer board, ensuring we met the needs of all incoming students to Bioengineering.

One of the biggest successes of the year was our ability to expand our traditional events and broaden our reach beyond the bounds of UCSD using the tools of remote learning. Our Bioengineering Day event was brought to local high school students, as well as university students from Instituto Tecnológico de Sonora. With our Outreach committee, we were able to extend our traditional STEM education events to middle school students outside of San Diego county. We brought bioengineering to a group of over 200 high school students in the Central Valley, and we were able to serve as a resource to high school students from around the state as they began their college careers. These tools were also used to ensure social and personal connections for our members. Our social chairs provided a variety of unique events and competitions for our mentorship program, using various digital platforms. We were also able to collaborate with BMES chapters at other UC campuses for a larger social event.

This year has presented a series of unprecedented challenges and opportunities, but through it all, the UC San Diego chapter of BMES has continued its work to prepare the next class of bioengineers. Our success is due to the hard work and dedication of our officers and members. Their commitment to our organization, their peers, and their own growth is truly what continues to make the UCSD chapter the wonderful community it is, and we hope that the following CDR not only serves as a record of our work, but as an inspiration and guide to other chapters for more ways to diversify their impact and broaden their reach.

Sincerely,

Michael Bennington
Co-President, UCSD BMES Chapter
mbenning@ucsd.edu

Elisabette Magaña Tapia
Co-President, UCSD BMES Chapter
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Dr. John T. Watson
Director/Professor, Bioengineering
Founder, von Liebig Center
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Section I: Administrative Report

In the 2020-2021 academic year, UCSD BMES modified its leadership structure from previous iterations. First, the chapter elected Co-Presidents and three Vice Presidents during the 2019-2020 academic year, yielding a five-membered Executive Board. The newly-elected Executive Board then chose the Officer Board through an application and interview process, which resulted with the traditional sixteen officers. We also expanded Freshman into New Student Engagement by incorporating a Transfer Representative. The selected officers were responsible for various UCSD BMES activities with the Executive Board’s support, including: annual events (Lab Expo/ Translational Medicine Day/ Bioengineering Day); technical/professional development (Project Team/ New Student); community engagement (Outreach); social/mentorship activities (Social); and organization coordination (Publicity/ Webmaster).

Membership to the organization was available to all undergraduate students at UCSD, regardless of major, seniority, or presence in the San Diego area. All our programs outside of Social, Publicity, and Webmaster had committees led by their respective officers. Those weekly committee meetings were open to everyone, giving even new members the opportunity to be involved in the planning process, contribute their ideas, and be impactful in the organization. Furthermore, members could choose to purchase a paid membership to access our mentorship program, faculty-sponsored projects, and other incentives.

I.1: Leadership Team and Administration Structure

The leadership team, administrative structure, and division of labor of the UCSD chapter of BMES can be seen in the organizational diagram below.
Figure 1: The leadership team and administrative structure of BMES at UC San Diego. Five Executive Board members are responsible as liaisons for the sixteen Officer Board members, with the lines indicating division of labor and the number in parentheses indicating the number of people allocated to that position. Some of the officers in turn have a committee they work with, and each officer’s main program(s) are color-coded according to the legend.

I.1.1: Executive Board

Applications to be on the UCSD BMES Executive Board for the 2020-2021 academic year were open to all paid members of the organization who were not graduating prior to June 2021. The application cycle was followed by elections for the new Executive Board members at the end of April 2020, which gave the position to the candidate(s) chosen by a majority vote. The 2020-2021 election cycle saw the first time in UCSD BMES history in which there were both individual and paired candidates running for the position of President, and with the election of the paired Co-Presidents, the new Executive Board consisted of five members. These five members were immediately tasked with identifying their vision for the organization in the upcoming year, along with selecting the new Officer Board from the applicant pool.

- Co-Presidents: Michael Bennington (mbenning@ucsd.edu) & Elisabeth Magana Tapia (emtapia@ucsd.edu)
  - Chief executive officers of the organization. Oversee all organizational operations and programs, maintain regular contact with key Bioengineering Department figures, lead all chapter meetings, communicate with other BMES chapters, and ensure the chapter vision is upheld.

- Vice President Internal: Shuo-Ren (Kevin) Hsu (shh225@ucsd.edu)
  - Logistical engineer and fellowship developer of the organization. Secretarial duties include announcements, program documentation, organizational branding, and tracking membership information. Responsible for board cohesion and communication within BMES.

- Vice President External: Aoife O’Farrell (aeofarre@ucsd.edu)
  - Consultant for professional development and inter-organizational programs. Facilitates member growth through offering industry and research experiences, connections, and opportunities. Represents BMES in Bioengineering Department meetings regarding industry outreach programs.

- Vice President Finance: Parker Hill (pjhill@ucsd.edu)
  - Manager of all chapter funds and monetary accounts. Assists officers seeking funding from the university and/or BMES affiliates, distributes chapter funds across all officers and events, and focuses on tracking chapter expenditures while balancing them with fundraising activities.
Executive Board meetings this year occurred on various weeks at the discretion of the Executive Board members. They were weekly at the start of the academic year due to the flurry of advertising campaigns and new member outreach events during that period, and they were also planned when important events approached, such as our annual professional conferences and the Executive Board Election. During these meetings, the VP Internal would be responsible for taking attendance, tracking the team’s updates and accomplished tasks, and listing important action items to be done prior to the next meeting. The agenda for each meeting would follow updates in the order of individuals in the figure below, which is an example of what the notes for an Executive Board meeting would look like.

![Executive Board Meeting Minutes - 11/14/2020](image)

**Figure 2:** Sample of notes from an Executive Board meeting this year. Note the attendance checks at the top, followed by important action items, with accomplished tasks at the bottom.

### 1.1.2: Officer Board

Officer applications were open to all paid members of the organization provided they were not graduating prior to the June of the upcoming academic year. As per tradition, officers are generally selected through a process comprising of the aforementioned applications, a group interview, and an individual interview handled by the newly elected Executive Board in early May of the previous academic year, and this year was no different.

However, there were three officer positions this year that were not selected following this general timeline: Lab Expo Chairs (2), Freshman Representative (1), and Transfer Representative (1). Lab Expo occurs annually during mid to late January, meaning that early organization of the next committee will be immensely helpful for its success in the subsequent year. As such, Lab Expo Chairs of a given academic year are responsible for selecting two Lab Expo Interns in February or March, which occurs prior to the Executive Board Election. These Interns undergo mentorship of how to plan the event and run their committee by the Lab Expo
Chairs in the months after their selection. They are then appointed to Lab Expo Chair positions for the following year at the discretion of the new Executive Board based on their performance and cohesiveness with the new mission and Officer Board. On the other hand, the Representative positions for Freshman and a (new) Transfer are intended to provide leadership opportunities to new students to work with their fellow new students and peers. Hence, the application cycle for both positions are opened in October of the new academic year so that new students can also join the BMES leadership team. These applications undergo a similar application and interview process, with final decisions announced that November.

Officer Board meetings occurred weekly with additional dates as necessary for upcoming important events. The assembly day would vary each term based on the availability of the officers surveyed at the end of the previous quarter to ensure that most, if not all, of the officers would be able to attend these weekly meetings. Each meeting was structured to last between half an hour to an hour for officers to present their updates to the team. This was when event committees would ask for help from other officers, cross-committee socials were planned, advice was given, and more. The VP Internal is also responsible for dictation during these meetings. Illustrated below is the general agenda for each officer meeting, the day and time for the meeting per term, and an example of the presentation and notes from the weekly meeting.

1. Officers present their weekly updates in a predetermined order
2. Executive Board members review their work over the past week
3. Important additional updates regarding upcoming events (e.g. Annual BMES Meeting logistics, important upcoming annual programs, general body meeting preparations, etc.)

Table 1: Schedule of Weekly Officer Meetings by Term

<table>
<thead>
<tr>
<th>Officer Meetings</th>
<th>Fall Quarter 2020</th>
<th>Winter Quarter 2021</th>
<th>Spring Quarter 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day &amp; Time</td>
<td>Wednesdays, 7 – 8 PM</td>
<td>Wednesdays, 7 – 8 PM</td>
<td>Mondays, 7 – 8 PM</td>
</tr>
</tbody>
</table>

Figure 3: Example of presentation slide and notes from one of the weekly Officer Meetings. The notes format mimics that of the Executive Board Meetings, albeit with more people.
<table>
<thead>
<tr>
<th>Board Position</th>
<th>Officer Name</th>
<th>National Member ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioengineering Day Co-Chair</td>
<td>Skye Edwards</td>
<td>4023143</td>
</tr>
<tr>
<td>Bioengineering Day Co-Chair</td>
<td>Zoe Tcheng</td>
<td>4023123</td>
</tr>
<tr>
<td>Freshman Representative</td>
<td>Capalina Melentyev</td>
<td>N/A</td>
</tr>
<tr>
<td>Lab Expo Co-Chair</td>
<td>Mary Nguyen</td>
<td>4023257</td>
</tr>
<tr>
<td>Lab Expo Co-Chair</td>
<td>Tammy Nguyen</td>
<td>4023158</td>
</tr>
<tr>
<td>Outreach Co-Chair</td>
<td>Carlos Pondevida</td>
<td>4022964</td>
</tr>
<tr>
<td>Outreach Co-Chair</td>
<td>Meagan Rowan</td>
<td>4023195</td>
</tr>
<tr>
<td>Project Team Co-Chair</td>
<td>Bryan Nguyen</td>
<td>4023196</td>
</tr>
<tr>
<td>Project Team Co-Chair</td>
<td>Yifan Lin</td>
<td>4023128</td>
</tr>
<tr>
<td>Publicity Chair</td>
<td>Jadyn Antonio-Valdez</td>
<td>4023111</td>
</tr>
<tr>
<td>Social Co-Chair</td>
<td>Elaine Tran</td>
<td>4023110</td>
</tr>
<tr>
<td>Social Co-Chair</td>
<td>Nipun Talwar</td>
<td>4018390</td>
</tr>
<tr>
<td>Transfer Representative</td>
<td>Alvaro Rivas</td>
<td>N/A</td>
</tr>
<tr>
<td>Translational Medicine Day Co-Chair</td>
<td>Karthik Raj</td>
<td>4023188</td>
</tr>
<tr>
<td>Translational Medicine Day Co-Chair</td>
<td>Rachel Lian</td>
<td>4023171</td>
</tr>
<tr>
<td>Webmaster</td>
<td>Jay Golden</td>
<td>4023159</td>
</tr>
<tr>
<td>Co-President</td>
<td>Elisabette Tapia</td>
<td>4018406</td>
</tr>
<tr>
<td>Co-President</td>
<td>Michael Bennington</td>
<td>4011497</td>
</tr>
<tr>
<td>Vice President Internal</td>
<td>Shuo-Ren (Kevin) Hsu</td>
<td>4022965</td>
</tr>
<tr>
<td>Vice President External</td>
<td>Aoife O'Farrell</td>
<td>4018434</td>
</tr>
<tr>
<td>Vice President Finance</td>
<td>Parker Hill</td>
<td>4018387</td>
</tr>
</tbody>
</table>
I.1.3: Committee Organization

The continuation of the organized committee structure used to plan our programs through the duration of remote learning speaks to its adaptability and sustained success. The committee structure’s goal of bringing general members passionate about a program together to work on meaningful projects while enjoying the company was indubitably valuable during these lonely times of only virtual contact. Thus, a strong, well-connected community evolved from each committee that engaged its members well to improve the quality of our resulting programs.

Committees were open to all general members of UCSD BMES, and their weekly meetings improved member accessibility to attending their choice committees. The division of labor went further into Subcommittee Leads in all committees besides New Student and Outreach, which gave direct authority over certain aspects of a program to motivated individuals within the committee. The number, scope, and holders of Lead positions were balanced by the expert opinions of the responsible officers, so there could be five to fifteen Lead positions, usually held by general members to increase their involvement. For example, in this academic year the Bioengineering Day Chairs distributed their Leads across aspects of the virtual Bioengineering Day event, which led to thirteen Leads holding nine Lead positions listed here: Industry/Grad Demos Lead, Finance Lead, Posters Lead, Media/Marketing Lead, Keynote Speaker Lead, Socials/Networking Lead, Quizbowl Lead, Judges Lead, and Website Lead.

I.2: Membership

General membership to join UCSD BMES was open to all undergraduate students interested in the field of bioengineering, regardless of age, year, or major. The term of a “general member” is given to a student who plans and/or participates in any of our programs, such as attending our general body meetings. As such, the term is undefined with no data on how many we have. However, we offer a paid membership option with additional incentives, which many active members choose to purchase. These members have no obligations or responsibilities to BMES, and their participation in our programs and opportunities is always voluntary.

I.2.1: General Body Meetings (GBMs)

To keep all of our members updated on the status of our programs as they developed, we hosted two GBMs every quarter. These virtual events were our main opportunities to welcome in new members into the BMES community, as officers promoted their committee while giving detailed updates at each GBM. Furthermore, all members would learn of upcoming events and activities they could potentially be interested in, such as professional development events, socials, and more. Due to the online nature of our GBMs this year, we hosted post-GBM socials only a few times. Because none of the events were in-person, all of the GBMs had no associated costs. A representative agenda of our GBM format can be found below, which altogether spanned approximately two hours from 6 – 8 PM.
1. Pre-GBM Meet & Greet (30 minutes)
   a. UCSD BMES Discord Server
   b. Themed voice channels for icebreakers
   c. Members get to meet the Officer Board and ask them questions
2. General Overview of UCSD BMES (10 minutes)
   a. Shift from Discord to provided Zoom link
   b. Mission Statement
   c. Executive Board members’ self-introductions
3. Officer Board Updates (50 minutes)
   a. Officers’ self-introductions
   b. Overview of their key program(s)
   c. Updates on progress and new announcements
   d. Occurs in a specified order of officers
4. Executive Board Updates (15 minutes)
   a. Paid membership logistics
   b. Upcoming organization-wide events
5. Post-GBM Social (occasionally, 30 minutes – 1 hour)

Table 3: Logistics for GBMs for the 2020-2021 Academic Year

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Name</th>
<th>Attendance</th>
<th>Theme</th>
<th>Post-GBM Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/21/2020</td>
<td>Fall GBM #1</td>
<td>63</td>
<td>Cereals</td>
<td>Trivia Night</td>
</tr>
<tr>
<td>12/02/2020</td>
<td>Fall GBM #2</td>
<td>38</td>
<td>Superheroes</td>
<td>N/A</td>
</tr>
<tr>
<td>01/13/2021</td>
<td>Winter GBM #1</td>
<td>44</td>
<td>Breakfast Foods</td>
<td>Mock Quizbowl</td>
</tr>
<tr>
<td>02/24/2021</td>
<td>Winter GBM #2</td>
<td>27</td>
<td>Colors</td>
<td>N/A</td>
</tr>
<tr>
<td>04/07/2021</td>
<td>Spring GBM #1</td>
<td>36</td>
<td>Fruits</td>
<td>N/A</td>
</tr>
<tr>
<td>05/19/2021</td>
<td>Spring GBM #2</td>
<td>30</td>
<td>Holidays</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Figure 4: Two examples of UCSD BMES GBM presentation slides.
I.2.2: Paid Membership

As previously mentioned, UCSD BMES offers a paid membership option. The membership fee was either $25 with our organizational T-shirt newly designed by our Publicity Chair and VP Internal or $15 without the T-shirt during Fall Quarter. These options were decreased to $20 and $10 respectively for both Winter and Spring Quarters. The availability of two types of membership this year reflect the fact that while many of the Officer Board members were still in the San Diego area, which is where the ordered T-shirts were delivered, not every member interested in BMES would be present in San Diego this year due to the choice of staying home to learn remotely. As such, we wanted to give the option of whether paid members would like a shirt or not based on their availability to pick it up from the UCSD area. The proceeds from membership payments were used to fund our social events, annual programs, and technical projects. In return, paid members could participate in our mentorship program, apply for faculty-sponsored technical projects, and apply to become an officer, among other incentives. This year, we ended up with 77 paid members in UCSD BMES.

I.2.3: Diversity Within UCSD BMES

As stated in our mission for this year, UCSD BMES is proud to serve a diverse community of bioengineers from an array of backgrounds, ensuring all undergraduate students feel welcome in our organization regardless of age, major, or identity. We obtained the following information from surveying our paid members, which highlights the diversity within our community.

Figure 5: Year of study for the 77 paid members of UCSD BMES.
Figure 6: Majors of the 77 paid members of UCSD BMES. The left panel represents all majors and features the four main tracks of Bioengineering, with colors shown in the bottom legend except for purple. The purple slice represents non-bioengineering majors, which are split into the categories given in the right panel.

The information provided by our paid members depicted above have reinforced our commitment to acknowledging and addressing the needs of all the diverse students interested in bioengineering, regardless of their background or experience in the field. Whether they be new students, transfer students, non-bioengineering majors, a mix of the above, or none of the above, the increasing diversity of the UCSD BMES community has and will continue to guide our vision of making UCSD BMES more inclusive.

I.2.4: National Membership

All Officers besides the Freshman and Transfer Representatives were registered as National BMES members for the 2020-2021 academic year. A table with their names, positions and National Member IDs can be found in Table 2 in Section I.1.2. Additionally, due to the virtual nature of the Annual BMES Meeting, we advertised the option for general members to purchase their own National BMES membership, for which we offered the National membership cost as a substitute for that of our paid membership. As such, since one of our general members purchased a National BMES membership, twenty of our 77 paid members are National BMES members. Figure 7 below pictorially summarizes our overall membership situation.
Figure 7: Membership types within UCSD BMES. While there are 77 paid members, there is no data regarding the total number of general members. The red circles indicate National BMES members, yielding a total of twenty National BMES members in UCSD BMES.

I.3: Affiliations

Although the UCSD chapter of BMES is operated independently, we are affiliated with a plethora of other on-campus organizations and institutions.

1. The UC San Diego Department of Bioengineering
   We at UCSD BMES are the ambassadors of undergraduate students to the Department of Bioengineering. The Department has entrusted us to host crucial events, including Bioengineering Day (featuring final poster presentations from the Senior Design Project course sequence), the Bioengineering Career Fair, biannual Town Halls, and more. Furthermore, BMES representatives participate in a variety of Departmental meetings regarding student affairs, hold membership in the Industry Relations Board, and are delegated the task of preparing and distribution graduation stoles. Our beneficial collaboration with the Department has continued throughout this year’s remote format.
2. Triton Engineering Student Council (TESC)
Chartered by the UC San Diego Jacobs School of Engineering, TESC is an undergraduate-run student council formed by representatives of various engineering organizations. BMES holds a full membership within TESC, and the Co-Presidents attended bi-quarterly TESC Council Meetings. As a full member, we participate and vote in discussions regarding policies for engineering organization status, Jacobs School student affairs, and resource allocation for the student body.

3. The Associated Students (AS) of UC San Diego
UCSD BMES registers annually following AS guidelines to maintain and protect its student organization status on the UC San Diego campus. Doing so allows the organization’s principal members recognized by AS to apply for student event funding, reserve campus event spaces, and rent facilities and equipment for organizational use.
Section II: Treasury Report

The Vice President of Finance of the UC San Diego chapter of BMES is responsible for monitoring all associated financial accounts and tracking cash flow during the academic year. In addition, the VP Finance serves as a financial consultant for all the committees, especially for those hosting our annual events. Though budgeting is unfamiliar territory for many officers, the VP Finance assists them by optimizing their budgets and applying for more funding sources. Normally, the organization’s income comes partially from other monetary contributors, including the Associated Students (AS) of UC San Diego, the UC San Diego Department of Bioengineering, and other applications of grant money for UCSD BMES and its programs. As a direct result of the COVID-19 pandemic, however, BMES was unable to host any events on campus. With no room reservations, food requirements, or advertising requirements, costs and fundraisers were much lower this year when compared to previous iterations. Most organizational expenses this year took the form of gifts for presenters at our virtual events, and funding for our programs was primarily sourced from UCSD BMES funds. The following is a timeline of cash flow for the UC San Diego chapter of BMES for this fiscal year.

II.1: Financial Summary

Below is a tabulated financial statement with a Balance Sheet broken down by academic term and Profit and Loss Statement of the BMES bank account for the 2020-2021 academic year.

Table 4: UCSD BMES Financial Statement for the 2020-2021 Academic Year

<table>
<thead>
<tr>
<th></th>
<th>Fall Quarter 2020</th>
<th>Winter Quarter 2021</th>
<th>Spring Quarter 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Starting Balance</strong></td>
<td>$6,805.05</td>
<td>$6,449.68</td>
<td>$5,935.94</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td>$1,275.37</td>
<td>$868.74</td>
<td>$1,011.87</td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td>$920.00</td>
<td>$355.00</td>
<td>$3,790.00</td>
</tr>
<tr>
<td><strong>Ending Balance</strong></td>
<td>$6,449.68</td>
<td>$5,935.94</td>
<td>$8,714.07</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Income</strong></td>
<td></td>
<td>$5,065.00</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td></td>
<td>$3,155.98</td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td></td>
<td>+$1,909.02</td>
</tr>
</tbody>
</table>

NOTE: Financial contributors discussed in the abstract are not included in the financial statement calculations shown in Table 4.
In Figure 8, the breakdown of the organization’s $3,155.98 in expenses per committee is made clear. The Executive Board is responsible for the most expenditure due to purchasing UCSD BMES T-shirts and graduation stoles. Afterwards, we have Translational Medicine Day and Lab Expo requiring the most expenditure for preparation of their annual events.

In Figure 9, the three fundraising sources for UCSD BMES during the 2020-2021 academic year are shown, which cumulatively generated $5,065.00 in revenue for the organization. To put it explicitly, reimbursements from officers for pre-paid jackets yielded $750.00, paid memberships yielded $1,315.00, and graduation stoles yielded $3,000.00 in revenue.
II.2: Quarterly Financial Details

II.1.1: Fall Quarter

The first initial cost of the year was the $250 registration fee per officer for the Annual BMES Meeting. Under normal circumstances, we would have registered for the event and volunteered a specified amount of time as a substitute payment for the registration fee. However, due to minimal volunteer slots and the virtual nature of the event, we were unable to use volunteering hours to pay for the event. Thus, we outsourced funding from the Idea Center in the UC San Diego Jacobs School of Engineering as well as the UC San Diego Department of Bioengineering to pay for our attendance at the Annual BMES Meeting. All reimbursements were fully processed by the end of the quarter. One officer did not have the capability pay the registration fee up front, so we used the BMES account to lend the money until they were reimbursed and could in turn reimburse the BMES account. The other major expense from this quarter was for purchasing shirts, which cost approximately $1000. The shirts were sold to members for $5 if they paid the $30 membership fee to become a National BMES Member. The rest of the quarter saw us regain some of the money we used on shirts in the form of membership fees. As for committee expenses, the Social Co-Chairs used $40 of funds to facilitate prizes for their events.

II.1.2: Winter Quarter

During winter quarter, committees began being reimbursed for their event expenditures. Lab Expo only needed reimbursement for gifts, for which they spent approximately $320. The design project team SURGEO, a part of the Project Team Committee, was reimbursed approximately $150 for design prototyping parts. Translational Medicine Day then needed to be reimbursed approximately $400 post-event to pay for presenter gifts and their use of gather.town as the networking platform for the event.

II.1.3: Spring Quarter

Moving into the final quarter of the 2020-2021 academic year, reimbursements were first given to our social committee for prizes given to their event winners. We then fronted the cost for jackets for Officer Board members which will soon be reimbursed by the officers once the jackets physically arrive. Later, Bioengineering Day was reimbursed approximately $200 for presenter gifts, and they also received $1,300 in funding from the Department of Bioengineering for student awards for excellence and their networking platform Remo. The final notable source of revenue will be coming near the end of the quarter, as we are working with the Bioengineering Department to distribute graduation stoles we designed. The department agreed to pay for the stoles, and we will be compensated approximately $3000 provided we distribute the stoles for the department as well.
II.3: Principal Means of Fundraising

II.3.1: UCSD BMES Paid Membership

As previously mentioned in this section and in Section I.2.2, the UC San Diego chapter of BMES offers a paid membership option with dues varying between $25 and $10 depending on the quarter joined and the choice of receiving a UCSD BMES T-shirt or not. Incentives provided to paid members besides the optional T-shirt include: the mentorship program, applications to project cycles, officer applications, Virtual BMES Retreat, Virtual BMES Olympics, and the End of the Year Celebration.

II.3.2: Annual Officer Auction  *(Canceled due to COVID-19)*

For the second year in a row, the Annual Officer Auction was canceled due to difficulties arising from the COVID-19 pandemic. Prior to the COVID-19 pandemic, the officers would participate in this fun annual fundraiser where the board members put out offers of services or products, such as music lessons, dinner with a friend, photo shoots, etc. in a general member auction, sold to the highest bidder(s) who give their donation to the organization. This is an event that we foresee to return with great expectations once in-person events are normalized again.

II.3.3: UCSD Bioengineering Graduation Stoles

The design and sale of Bioengineering graduation stoles is another annual fundraiser for the organization. In collaboration with the UC San Diego Bioengineering Department, while we focused on the designing, pre-ordering logistics, and organized distribution of the stoles, the Department purchased the finalized stoles for us. The sales process has been handled by the VP Finance, and we will ultimately receive a compensation payment of around $3,000 for our work in making the stoles readily available to all interested bioengineering graduates. Speaking of which, congratulations to the class of 2021! They have made it through over a year of remote learning to finally make some last-minute memories with in-person graduation ceremonies, graduation pictures, and visits to friends not done via Zoom. They have done so well to live and succeed during these times, and they deserve all the celebrations that are forthcoming.

II.3.4: Vendor Fair  *(Canceled due to COVID-19)*

This is a UCSD-hosted in-person event that functions as a fundraiser-social hybrid where members gather to make some food products to sell on our campus' Library Walk. Unfortunately, COVID-19 restrictions prohibited this event from occurring this year, thus preventing us from fundraising with this method.
II.4: Future Finances

Moving forward to next year, our expenditures should revert to a normalized in-person situation, with most of the in-person costs (e.g. room reservations, the potential for catered food, keynote speakers, etc.) being covered by external sources such as AS and TESC. While the input and output of money from the BMES account this year was handled primarily with Venmo, this will likely at least partially default to the use of cash as a means of payment and cash flow. The financial statement summarizing organization expenditures and revenue can be used as a guide for what to expect in terms of financial support from annual fundraising sources, but it should also be noted that most of these costs and incomes are changed from an in-person situation due to the virtual nature of our work this year. To keep track of cash flows in the future, the use of a spreadsheet for streamlining payments, expenditures, and reimbursement processes (as was done this year) is highly recommended, especially with both cash and Venmo being utilized. An example of what the finance tracking spreadsheet can look like is seen below in Figure 10, where the input represents sources of revenue and the output represents expenditures. Keeping the organization’s finances to a line-item detail will be incredibly helpful in ensuring transparency and complete knowledge of the sources and uses of organizational funds. Improvements can always be made to keep track of individuals and/or committees for which funds are being transferred, which can boost clarity and ease of review.

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Input</th>
<th>Output</th>
<th>New Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/14/2020</td>
<td>Beginning of Year</td>
<td></td>
<td></td>
<td>6806.05</td>
</tr>
<tr>
<td>1/5/2020</td>
<td>National Registration for 1 officer</td>
<td>250</td>
<td></td>
<td>6555.05</td>
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<tr>
<td>1/22/2020</td>
<td>BMES Shirts Order</td>
<td>985.37</td>
<td></td>
<td>5569.68</td>
</tr>
<tr>
<td>1/22/2020</td>
<td>Social Reimbursement</td>
<td>20</td>
<td></td>
<td>5549.68</td>
</tr>
<tr>
<td>1/24/2020</td>
<td>Social Reimbursement</td>
<td>20</td>
<td></td>
<td>5529.68</td>
</tr>
<tr>
<td>1/30/2020</td>
<td>Venmo Transfer (Membership)</td>
<td>730</td>
<td></td>
<td>6319.68</td>
</tr>
<tr>
<td>1/14/2020</td>
<td>Venmo Transfer (Membership)</td>
<td>130</td>
<td></td>
<td>6449.68</td>
</tr>
</tbody>
</table>

**Figure 10:** Partial Screenshot of Example Finance Tracking Sheet
Section III: Chapter Activities

The following Section documents the large conference-style events hosted either entirely or principally by UCSD BMES. These programs would fall under the “annual events” category from Figure 1, which generally last for at least half a day and take months of dedication and persistence from their respective committees to organize and run effectively. Information regarding the other prominent UCSD BMES programs (Social, Outreach, etc.) are discussed in the following sections.

III.1: Lab Expo

Audience: All UC San Diego undergraduates, graduate students, faculty, staff, and the general public who are passionate about multidisciplinary research and scientific advocacy

Lab Expo 2021 marks the 10th anniversary of the event’s establishment as one of the many integral UCSD BMES events hosted for all undergraduate, graduate, and campus faculty. However, Lab Expo 2021 marks its first year as a fully virtual event due to the pandemic. Even with the scaled back operation in terms of committee member recruitment and restrictions on what components of Lab Expo we were able to transfer into a completely online setting, Lab Expo 2021 was overall still a successful event.

The Lab Expo committee consisted of nine core members, eight of which were in sub-lead positions, and many others assisting with smaller details of the event. The planning process began late in the previous academic year and spanned through summer all the way until the event date in January. Although it was far from the 50 members and sub-leads that composed last year’s committee, those able to help plan our fantastic event embodied and shaped the mission of Lab Expo. The main vision for Lab Expo 2021 was to be diverse and be inclusive of all research. This vision could be interpreted in a myriad of directions, but our goal this year was to focus on attempting to diversify our presenter pool, which we readily achieved under the virtual nature of Lab Expo 2021.

The event itself consisted of four main parts: a research pitch competition, a keynote speech, a networking session, and a traditional poster session. Lab Expo 2021 began with our continued
Lab Expo Graduate Showdown lightning talk competition, during which graduate student contestants presented their researched concisely and effectively. This then transitioned into Mr. Tan’s inspirational keynote speech on mindfulness and work-life balance. After, we held two separate networking sessions that gave students the opportunity to network with faculty and industry representatives, and our event closed out with the final activity being the poster session. Although we did face a crisis during the event, in which we discovered that one person could only run up to three Zoom calls at a time, the error was swiftly corrected by the team and everything was back in working order again in just a couple of minutes.

In addition to our main event, this year we hosted collaborative events with Tau Beta Pi (an engineering honors society) and BMES’s New Student Committee in preparation for the professional conference, a first for the committee. The first event was Leveling Up to Lab Expo in collaboration with Tau Beta Pi. The event started with a question-and-answer session featuring Josh Mesfin, a graduate student in Dr. Karen Christman’s Lab, which attends Lab Expo annually seeking new undergraduate researchers. The second half of the event included a presentation on how to navigate Lab Expo for students attending the event for the first time and a Lab Expo simulation of how to get into a lab during the event. Secondly, we co-hosted Dipping Your Toes into Research in collaboration with BMES’ New Student Committee. For this event, there was a panel of undergraduates who talked about their prior and/or current laboratory research experience and what they gained from pursuing those endeavors. More information on this event can be found under Section VIII.8.1.

The impact our collaborative and conference events had on the student body in attendance was beneficial, insightful, and enjoyable based on our event feedback. With Lab Expo, our attendees loved Mr. Chase Meng-Tan’s keynote speech regarding mindfulness and work-life balance. It gave an opportunity for us busy students to take a moment and escape the hectic lives that we have been going through given a virtual learning environment. As for the collaborative events, Leveling Up to Lab Expo had a surprising turnout, as it was the first collaborative event this year with an external organization. People gave strong positive feedback about this event as valuable preparation for new students regarding approaching potentially daunting professors and/or graduate students to ask questions about their research. Finally, with our New Student Committee collaborative event, students demonstrated express interest in the experiences current undergraduates have had in current and prior laboratory research positions, especially in those who received their position through Lab Expo. From these programs, it was clear that students appreciated guidance on obtaining a coveted undergraduate research position and still yearned for in-person laboratory experiences.

Despite it being the first-ever completely virtual Lab Expo, we are proud to have done what we believe was a phenomenal job with what was available to us and our notably smaller but more cohesive team. We were able to host a successful event that brought together 30 presenters and 243 attendees to promote our mission of scientific literacy and interdisciplinary collaboration while inspiring scientific advocacy. Though there was definitely room for improvement with
regards to event efficiency and adjustments to remove technical errors during this year’s event, we are excited for what the future members and leaders of Lab Expo will do with the blueprint of an online format that we have created.

<table>
<thead>
<tr>
<th>Lab Expo x Tau Beta Pi: Leveling Up to Lab Expo</th>
<th>01/15/2021 6:30 - 8:00 PM</th>
<th>Total Attendance: 30</th>
<th>Cost: $0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Expo 2021</td>
<td>01/29/2021 10:00 AM - 4:00 PM</td>
<td>Total Attendance: 273 (243 Attendees, 30 Presenters)</td>
<td>Cost: $329.91</td>
</tr>
</tbody>
</table>

Screenshots from Lab Expo 2021

Screenshot of the Lab Expo 2021 Committee
III.2: Bioengineering Experience

**Audience:** Targeted towards current bioengineering majors, but any students interested in bioengineering are welcome to attend.

The Bioengineering Experience (BeX) is one of the two major events hosted by the New Student Committee, the other being Switching into Bioengineering (SWiB), but in contrast to SWiB, BeX is geared more towards students who are already bioengineering majors and are also relatively certain they will continue to be students of this department for their foreseeable undergraduate career. Therefore, the Bioengineering Experience strives to demonstrate to these students what being a bioengineer entails, what it is that makes them unique, and most importantly, to give them further insight on whether the experience of bioengineers in undergraduate, graduate, and postgraduate levels is something they desire. In doing so, we have achieved our mission to illustrate to the bioengineering students what four undergraduate years in bioengineering would look like at UCSD along with how they can make use of these years productively so they may be prepared for the next step of their professional journey.

We had a keynote speaker in Dr. Valdez-Jasso, who touched upon a variety of topics, such as her personal experiences, future of bioengineering innovations, and the current landscape of bioengineering research, and we also introduced an alumni panel for the second half of the event. This speaker group included alumni who following the paths of industrial professionals post-graduation as well as graduate students working in bioengineering-related research so students received a broad view of the day to day life, overarching goals, similarities, and differences between industry and academia as two potential future professional paths with an undergraduate bioengineering degree from UC San Diego.

| The Bioengineering Experience | 02/19/2021 6:00 – 8:00 PM | Total Attendance: 37 | Cost: $0 |
III.3: Translational Medicine Day

Audience:

- **Primary:** Students, presenters, and community members interested in learning about the promise of the translational medicine field
- **Secondary:** UCSD graduate and medical school students, students from community colleges, high school, and other universities

UCSD's Translational Medicine Committee is geared towards highlighting and celebrating the potential of translational medicine via first-hand experience from professionals in this field. One of the primary ways this goal is achieved is through Translational Medicine Day (TMD): the annual conference-style event where prominent researchers, industry experts, and students from all over the world gather to redefine the limits of translational medicine.

Translational Medicine Day features seven unique events: Keynote Speaker, Speaker Sessions, Industry Demonstrations, MD/PhD Panel, Start-Ups Panel, Ethics Panel, and Networking Reception. This year’s keynote speaker, Dr. Jesse Nodora, exceeded our expectations by introducing the novel idea of bench-to-bedside-to-community and emphasized the importance of creating innovations that are accessible by the communities who need them the most. The event’s Speaker Sessions featured four different UCSD faculty professors who gave excellent talks about ongoing research within their corresponding fields and how interested students
could get involved. Industry Demonstrations was an occasion for our attendees to meet and discuss with representatives from five companies: Johnson & Johnson, MaxCyte, Cellink, Medtronic, and OnRamp. The MD/PhD Panel gave an overview of various graduate programs from UCSD, Harvard, University of Nebraska, and the City College of New York, which also explained changes to admission process due to the COVID-19 pandemic. Our new initiative, the Start-Ups Panel, illustrated another path in which ideas can be introduced into the market and the diverse ways in which this is possible. Lastly, our Ethics Panel focused on the ethical challenges of incorporating personalized healthcare and genomic data within clinical delivery. As usual, we concluded Translational Medicine Day with our networking reception, which occurred on gather.town to maintain the remote nature of the event.

Regardless of whether you are a presenter, attendee, or committee member, everyone benefits from Translational Medicine Day. Attendees get to hear about the exciting research occurring in various fields and learn the potential career pathways to become involved in these fields such as graduate school, industry, or start-ups. Also, due to the remote nature of Translational Medicine Day, they get to connect with researchers and industry experts from all over the world and are encouraged to maintain contact with them. Presenters are provided the opportunity to showcase their work and gain new insights, whether it be from interactions with other presenters or discussions with attendees. Lastly, our committee members develop crucial skills in leadership, communication, time management, etc. and learn how to make their visions a reality. Without them, Translational Medicine Day would not exist, and their growth from their time in this committee ensures that they will excel in any future endeavor.

The bulk of the planning process took approximately 8 months, from August 2020 to March 2021. During this time, the TMD Committee met weekly to work on contacting potential presenters, make branding and advertising materials, advertise the event, and plan logistics. Following TMD 2020’s sudden transition to an online format due to the COVID-19 pandemic, this year we had the opportunity to plan for a virtual event from the beginning. Due to public health guidelines, this was the only way to ensure the safety and comfort of everyone involved. Thus, we transitioned all of our sessions to a virtual format through our event website, with all of our events being held on Zoom except our Networking Event, which took place on gather.town, an interactive platform where people can move discussions between stations similarly to an in-person networking event.

While this change in format unfortunately detracted from some of the excitement of a formal, in-person event, there were several benefits of holding the event online. We were able to invite many presenters from outside of San Diego and even California, with representatives from not only within the UC system, but also from Harvard University, Rice, the College of New York, and more. This gave our attendees a more diverse set of experiences and expertise. We were also able to expand our audience population. In the past, attendees were almost entirely UCSD students and faculty; this year, we reached out to university students around the country and
high school students as well. In fact, over 20% of our attendees were not undergraduates, and 18.5% were not affiliated with UCSD (see Figure 11 below).

![Year Distribution](image1)

![Are you a student at UCSD?](image2)

**Figure 11:** Survey of TMD attendee backgrounds featuring their year of study and UCSD association (or lack thereof).

This was also the first year that committee meetings were held through Zoom, but the general format of our meetings was similar to previous years: we started with introductions, an ice breaker activity, and updates, before going into work time for that week’s main goal. The differences in the way we ran our committee this year included the introduction of the Start-Ups Panel and having more Subcommittee Leads. As the Start-Ups Panel was finalized after choosing Leads, the Co-Chairs took the responsibility of planning it, which was an added task that Co-Chairs usually do not have. Additionally, in order to achieve greater efficiency, retain more committee members, and lessen the burden on individuals, we chose multiple Leads for many of the subevents; for example, the Industry Demonstrations had three Leads, and the MD/PhD Admissions Panel had two. This was effective at increasing productivity while decreasing individual responsibilities. We also predicted that advertising the event would be
more difficult due to the online nature, so we spent comparatively more time on it and delegated the task of advertising to everyone in the committee, which was crucial in getting as many attendees as we did.

It is with great pride that we can reflect on our efforts this past year and confidently say that they paid off; the event was a great success, with planners, presenters, and attendees finding it to be a rewarding experience.

| Translational Medicine Day 2021 | 03/05/2021 1:00 – 5:00 PM | Total attendance: 210 (184 attendees, 26 presenters) | Cost: $379 |

Screenshot of the TMD Committee from the TMD 2021 Website

III.4: Bioengineering Day

**Audience:**

- *Primary: UC San Diego undergraduate students interested in bioengineering*
Bioengineering Day (BE Day) is the largest annual bioengineering event at UC San Diego (UCSD) and showcases the excellence of the UCSD Bioengineering Department, student-led research essential to the program, and presenters from both academia and industry in the field of bioengineering. The event centers around the Senior Design projects where graduating student teams present their research done under faculty mentorship to inspire Juniors. BE Day also offers the opportunity to network with bioengineering experts through Demonstrations and a Networking Lunch. Our theme for BE Day 2021 was “Bringing the San Diego Bioengineering Community Together” because in a time where we must be physically apart, we wanted to focus on our bioengineering community here in San Diego and all that it has to offer. This meant that all our speakers either work in the San Diego area now or have ties to UCSD. We used Eventbrite to contact everyone who registered, easily update them, and send important and applicable event information. Our advertising was done mostly by posting on related Discord servers and reminding students in the Senior Design Program (both upcoming and current) that there were many aspects of BE Day to attend.

The Bioengineering Day 2021 Committee consisted of fourteen members who helped make our vision a reality by focusing on one aspect of the event each: Keynote Speaker, Poster Sessions, Industry and Graduate Student Demonstrations, Networking Lunch, Quizbowl, Poster Judges, Media Design, Finance, and Website. The only significant change in committee setup this year was the addition of Website Leads who created, edited, and finalized the BE Day 2021 website. They were a crucial addition to the team since the website was where all the information about our multifaceted event was located, which needed to be easy to navigate and visually appealing. Included in the fourteen members were the two Co-Chairs, Skye Edwards and Zoe Tcheng, who oversaw event design and planning, were the primary liaisons between the committee and the Bioengineering Department, made sure all of the members were completing their tasks, and filled in any gaps in order for the event to run as smoothly as possible. Delegation and organization on the part of the Co-Chairs made BE Day 2021 very successful, even in a virtual environment. Our committee met virtually every week from the beginning of the academic year to two weeks after our event was completed. The meetings were primarily meant for updates and troubleshooting, as a checklist for each Lead position was created during summer to allow our members to stay on top of assignments. To keep committee members engaged, we allowed our Social Lead to host games during the meetings that encouraged creativity, cultured community, and strengthened our bonds as a friends on the same committee.

During Summer 2020, the Co-Chairs decided that BE Day 2021 would be entirely virtual. Therefore, each element of BE Day 2021 needed to be altered to better fit an online environment
as well as focus on San Diego to fit our theme. The first event of the day after opening remarks was the Keynote presentation given by Erik Engelson, the current President and CEO of Lucira Health, Inc. It was titled “Bioengineering is a Career Launchpad” since Engelson is a UCSD alumnus where he earned his bachelor’s and master’s degrees and has a passion for education and career development. Two Poster Sessions were held in the morning and afternoon and each had 22 concurrent research presentations by undergraduate seniors for a total of 44. The students shared their unique design projects with industry, faculty, students, and other guests. This was an opportunity for the Senior Design Judges to observe and evaluate their performance and innovation which impacts UCSD’s Bioengineering ABET accreditation and prize determination. Lunch this year was held on a virtual platform called Remo that allowed participants to move around and sit at different tables. Professionals, students, and community members were able to meet and converse about any aspect of their careers and experiences. For the Industry and Graduate Student Demonstrations, we had three industry members and three graduate students present their research during two separate sessions to expose students to possible future paths after graduation. The penultimate part of BE Day 2021 was the Quizbowl Showcase Game where the first-place undergraduate team faced off against the guest graduate student team for prestige. The closing Awards Ceremony allowed student award winners and honorable mentions to be acknowledged for their efforts.

Bioengineering Day 2021 had 589 people register through Eventbrite and a total of 423 confirmed attendees, based on the people who filled out the sign-in form or a poster judging form. We also had about 98 people attend the Keynote Presentation, 37 at the Quizbowl Showcase Game, and 60 at the Awards Ceremony as well as an average of 45 at the Industry Demonstrations, 34 at the Graduate Student Demonstrations, and 41 at the Networking Lunch. For the Poster Prizes, there were four award categories: Best Overall Poster, Most Innovative Project, Best Attention to Detail, and Best in Communication. Four teams won monetary prizes for each category and six groups received honorable mentions in the categories that were not Best Poster. We were also able to award three monetary Quizbowl prizes (1st: $200, 2nd: $100, and 3rd: $50) for the top three undergraduate teams. We are grateful that so many people attended BE Day 2021 and were recognized for their outstanding work. Our website is here for anyone who would like to look at the 2020-21 Senior Design Posters or watch the videos of presentations from the event.

| Bioengineering Day 2021 | 04/23/2021 9:00 AM – 5:30 PM | Total attendance: 423 (10 BioE Alumni, 16 BioE Staff, 19 Graduate Student, 25 Industry, 143 Juniors, 150 Seniors, 12 Community Members, 3 High School Students, 45 Other Undergrad) | Cost: $1,489.75 |
# Table 5: Summary of Senior Design Project Awards for BE Day 2021

<table>
<thead>
<tr>
<th>Most Innovative Project</th>
<th>Best Attention to Detail</th>
<th>Best in Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prize $100:</strong> Group 29, Diagnosing &amp; Monitoring COVID-19 with a Rice Cooker</td>
<td><strong>Prize $100:</strong> Group 42, In-Silico Modeling to Determine Tau Aggregation Inhibiting Peptides</td>
<td><strong>Prize $100:</strong> Group 32, Dynamic Simulation and Analysis of Human Liver Metabolism</td>
</tr>
<tr>
<td><strong>Honorable Mention:</strong> Group 10, Portable Fluorescent Imaging for TBI Diagnostics</td>
<td><strong>Honorable Mention:</strong> Group 16, Computational Model to Optimize a Point-of-Care Diagnostic for TBI</td>
<td><strong>Honorable Mention:</strong> Group 30, Web Framework for AI-Powered EcoGenomics</td>
</tr>
<tr>
<td><strong>Honorable Mention:</strong> Group 43, Hearing Hands</td>
<td><strong>Honorable Mention:</strong> Group 7, Designing Testing Fixtures for Spinal Implants</td>
<td><strong>Honorable Mention:</strong> Group 44, Free Falling Plankton Observer</td>
</tr>
</tbody>
</table>

---

**Best Overall Poster**

**Prize $200:** Group 22, Tissue Engineered Lymph Node
Section IV: Social or Other Activities

Organization-wide social activities are essential for BMES members to bond and de-stress throughout the academic year. Our goal is for our members to engage with each other in friendly competitions and casual hangouts because these interactions lay the foundations of personal connections between individuals. A majority of BMES is centered around event planning and professional development, so social activities are important because they allow our members to interact with each other in a relaxed environment. These events establish BMES as a close-knit and inclusive community, and we continuously strive to provide a strong support network for our members. This was more important than ever this past year with the onset of the COVID-19 pandemic and a transition to virtual education. Because we were unable to meet in-person, it became significantly more difficult to truly get to know new people, even when they were in the same meetings and classes. As such, we focused on bringing everyone together through a variety of activities, such as virtual tournaments and game nights, where members could use some friendly competition to become acquainted with the rest of the organization. It can be difficult for new members, especially freshmen who are still very much new to college life, to find their niche in any organization and/or university, so we endeavor to ease this transition, particularly in this unprecedented year. We want to allow our members to get to know each other in small group settings within our pre-professional organization. In this way, we created a support network among members that they could rely on when the stresses of this year became too overwhelming.

IV.1: Getting to Know Campus Social

Audience: BMES members

We virtually revisited our favorite spots on campus and reminisced about the places we used to go. This served as the introductory activity for freshmen to experience campus from their homes and get to meet new freshmen. We also hosted a UCSD-trivia-themed Kahoot for attendees to learn about our campus, and the winner received a $20 gift card.
IV.2: Connect 4 Social

*Audience: BMES members*

To bring out the competitive spirit of our members, we hosted a bracket-style Connect 4 tournament with some of the best minds in BMES. This served as an informal icebreaker and networking event for students from all four years. The winner received a $20 gift card as a reward for their strategic brilliance.

IV.3: Halloween Costume Social

*Audience: BMES members*

For Halloween this year, we donned our costumes and hosted a costume competition! Participants came dressed as someone, or something, else. A vote was held to determine the people with the overall best costume and the most creative costume, who each earned a $10 gift card. The costume competition was followed up with a few rounds of Trivia Murder Party on Jackbox Games. We closed out the night by playing a few games of Among Us.
IV.4: Fall Quarter Pre-Finals Game Night

*Audience: BMES members*

To combat burnout and reduce stress in an unprecedented school year, we took a quick study break and played some online pictionary before finals week. This allowed BMES members to connect over their test anxieties and share reassurances with each other.

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Time</th>
<th>Attendees</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halloween Costume Social</td>
<td>10/30/2020</td>
<td>7:00 – 9:00 PM</td>
<td>14</td>
<td>$20</td>
</tr>
<tr>
<td>Pre-Finals Game Night</td>
<td>12/12/2020</td>
<td>5:00 – 6:00 PM</td>
<td>13</td>
<td>$0</td>
</tr>
<tr>
<td>Uno Tournament</td>
<td>01/16/2021</td>
<td>1:00 – 3:00 PM</td>
<td>13</td>
<td>$0</td>
</tr>
</tbody>
</table>
IV.6: Mario Kart Tournament

*Audience: BMES members*

We used the ever-popular Mario Kart mobile app and held several multiplayer matchups with everyone who attended. The races were fast paced and heated, and the winner received 500 points for their mentorship family.

<table>
<thead>
<tr>
<th>Mario Kart Tournament</th>
<th>02/06/2021 1:00 – 3:00 PM</th>
<th>Attendees: 15</th>
<th>Cost: $0</th>
</tr>
</thead>
</table>

IV.7: March Mammal Madness

*Audience: BMES members*

March Mammal Madness is an educational tournament run by Arizona State University and inspired by the NCAA Basketball March Madness. We participated in this tournament of simulated combat competition among animals by meeting together and researching the 65 different species in the bracket. Based on our research, we each predicted the winner of all the matches and followed along as the March Mammal Madness team provided regular updates throughout the month. This served as a long-term event that we could all get engaged in together, while also learning about new animal species.

<table>
<thead>
<tr>
<th>March Mammal Madness</th>
<th>02/26/2021 - 03/31/2021</th>
<th>Attendees: 11</th>
<th>Cost: $0</th>
</tr>
</thead>
</table>
IV.8: Deal or No Deal Social

*Audience: BMES members*

To introduce some suspense to the mentorship family point competition, we hosted a game show night, featuring Deal or No Deal. Channeling the energy of the show’s host, Howie Mandel, we guided participants from each family through a round of Deal or No Deal, where they had the chance to win up to 5,000 family points. This social required people from their respective families to work together and bond over some tough decisions.

![Deal or No Deal game](image)

| Deal or No Deal Social | 02/27/2021 8:00 – 10:00 PM | Attendees: 11 | Cost: $0 |

IV.9: Spring Quarter Retreat

*Audience: BMES members*

It is a BMES tradition to host an annual Spring Quarter Retreat, where members are able to spend the weekend bonding by exploring a new city together. While the COVID-19 pandemic stopped us from physically traveling, we utilized online resources to virtually explore Las Vegas together! A Google Street View scavenger hunt on the Las Vegas Strip was prepared on Typeform, an interactive platform, which sent attendees racing to find unique objects and places within several casinos. The scavenger hunt was followed up with free time to hangout on a custom hotel-themed map on [gather.town](https://gather.town), a 2D spatial video-calling platform. This map had several activities for attendees to do together, including, a maze, karaoke, Tetris, poker, a variety of board games, and a series of tasks designed to facilitate exploration of the hotel. This
allowed our members to participate in a major aspect of the Retreat experience from the safety of their homes.

Screenshots of the UCSD BMES Spring Quarter Retreat
IV.10: UCSD BMES STEM Spring Social

*Audience: All UCSD students interested in meeting others and playing games online*

This event was created due to the burnout that many students have been experiencing while taking online courses during the pandemic. The New Student Committee decided to create this event and reach out to multiple STEM-based organizations such as SHPE, ACM, PBIC and UBIC. This was done to create an experience where students would be able to have fun playing games while meeting new people across organizational boundaries.

IV.11: BioRender Art Social

*Audience: BMES members*

In a dual-purpose educational and social event, BMES members learned how to use Biorender, a valuable tool used to create professional quality graphics for scientific figures. However, instead of illustrating experimental procedures, attendees used the pre-created icons to construct creative masterpieces, both of original compositions and recreations of well-known art
pieces. This allowed members to become acquainted with a tool they can use in future classes and work while also having fun and bonding over the ingenuity of our community. Shown below is a recreation of Vincent van Gogh’s *Starry Night*, titled *Cell-y Night* by Kendra Worthington.

![Cell-y Night](Image)

*Cell-y Night* by Kendra Worthington

| **BioRender Art Social** | **05/01/2021**  
2:00 – 4:00 PM | **Attendees: 11** | **Cost: $0** |

**IV.12: Tetris Tournament**

*Audience: BMES members*

During the final social event of the year, members went head-to-head in a photo finish Tetris Tournament that ended with the winner receiving a $15 gift card to flaunt their hard-fought victory and geometrical prowess.
IV.13: Committee Socials

**Audience: Members of various BMES committees**

Committees host social events with their own social leads throughout the year. These events are open to general members outside their respective committees as well. All committee socials incurred no cost ($0) on the end of UCSD BMES.

**Table 6: List of 2020-2021 Committee-Organized Socials**

<table>
<thead>
<tr>
<th>Event Name</th>
<th>Date and Time</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Team Game Night Social</td>
<td>11/11/2020 7 – 9 PM</td>
<td>16</td>
</tr>
<tr>
<td>Bioengineering Day x Lab Expo Friendsgiving (BE ThanXPO)</td>
<td>11/28/2020 7 – 12 PM</td>
<td>30</td>
</tr>
<tr>
<td>Project Team Escape the Crate Social</td>
<td>02/08/2021 8 – 9 PM</td>
<td>7</td>
</tr>
</tbody>
</table>
Section V: Inter-Chapter Activities

In our effort to maintain our connections to other university chapters of BMES that was solidified in the previous year, we reached out to the University of California, Los Angeles and University of California, Irvine BMES chapters to organize an inter-chapter event. After some discussion, we decided on holding a trivia night social to unite members of the chapters from all three universities to encourage cross-chapter communication and friendships. Although this ended up being the only inter-chapter activity UCSD BMES participated in this year, we rest assured that the inter-chapter bonds we have forged in the prior years have been and will continue to be preserved as new Executive and Officer Boards come and go.

V.1: Inter-Chapter Trivia Brawl

At the beginning of the spring quarter, our Executive Board worked with the BMES chapters at UCLA and UC Irvine to plan an inter-chapter trivia night. Trivia teams were created with students from the three different schools. Students from the different schools were able to interact with each other, share upcoming events from their chapters and form connects with bioengineers from the larger southern California area. As this was a virtual event hosted through Discord and Zoom, this event incurred no cost on UCSD BMES.

| Inter-Chapter Trivia Brawl | 01/12/2021 8:00 – 9:00 PM | Attendees: ~100 from all three attending universities |
Section VI: Outreach Activities

The UCSD BMES Outreach Committee is dedicated to supporting STEM education within the San Diego community, but this year’s online format due to COVID-19 allowed us to increase our scope beyond San Diego to places as far as the Bay Area. In Outreach, we make engineering demos and lesson plans for kids, host educational workshops for high schoolers, volunteer at local STEM events, and more to support our community. Additionally, Outreach is responsible for volunteering in two large events: Light the Night and the San Diego Festival of Science and Engineering. As for year-round events, the Outreach committee is dedicated to Project EngINE (Engineers inspiring New Engineers) where the committee visits local middle schools and present engineering workshops. In addition, Outreach’s scope is limited only by its members’ interests, as the committee collaboratively designs and decides what activities/projects to pursue outside of large events. For instance, this year featured college Q&As for high schoolers, faculty panels for undergrads, and workshops for our members.

This year, our mission was to enrich our community through educational outreach and volunteer efforts across accessible platforms to inspire the next generations of scientists and engineers. Due to online circumstances, another goal evolved to utilize technology to expand our online presence and reach communities beyond the immediate San Diego area. In Outreach, we also aimed to choose projects that helped our committee members gain skills to help them become better engineers, as they too are included in our defined “community.”

This year’s Outreach committee faced the unique challenge of adapting our efforts to being fully online. In previous years, Outreach has done mainly in-person work, whether it be volunteering at different STEM events or going to schools to demonstrate our teaching models. Furthermore, our projects and teaching models have traditionally been physical projects wherein our committee met up to build them at workshops. This is especially true for the project we usually do for the San Diego Festival of Science and Engineering (SDFSE). So, a large part of this year was spent coming up with ways to impact the community through a virtual platform.

We started the year continuing an initiative started last year called College Conversations where we hosted advising sessions to high school students regarding college. Given that it would be hosted using Zoom, we took advantage of that to extend our reach beyond just the San Diego community. Committee members reached out not only to local high schools, but also high schools in other areas of the nation that they attended. In this way we were able to amass decent interest in our initiative and were able to start the committee off with a project that did not require extensive preparation beforehand.

For Project EngINE and our SDFSE project, we ran into issues about how to build demos that would be effective to present to students over a virtual format. Our traditional physical models would not be the best choice as it could only be shown in front of a camera. More importantly, students themselves would not be able to interact with them. Hence, this year we had a focus
on generating computer models/demos that can be shown in their entirety over Zoom. For Project EngINE this took the form of computer models of the heart in different states for a lesson plan on Heart Physiology. For SDFSE this took the form of a video game that children could play online that demonstrated parts of the immune system. Building these projects took time and there was an immense learning curve for all committee members. However, we did fabricate comprehensive working products that we hope next year’s committee can choose to use if they stick with online activities during the transitional return to in-person events.

One overall issue that we ran into this year was trying to reach out to teachers and schools about our different projects. With everything shifting online, the volume of emails that everyone dealt with increased greatly, which led to our outreach efforts being lost in inboxes. We tried to mitigate this through extending our reach beyond just San Diego. As mentioned earlier, since our efforts this year were being facilitated by virtual platforms, we could do presentations and workshops for schools outside the normal physical proximity of UCSD required by in-person events. Another thing that publicly bolstered our name brand was having our updated contact information and committee information up on the BMES website thanks to our Webmaster, Jay Golden. Some high school clubs and classes interested in bioengineering reached out to us using that information and we hosted workshops for them regarding different pathways in our field. Also, since we did end up reaching out to so many different schools and teachers this year, we amalgamated the contact information onto a spreadsheet for next year’s committee to use to save future years’ time searching for emails so they can quickly dive into their programs.

Despite the challenges of COVID-19 and the unfamiliar virtual environment that the Outreach Committee has had to navigate, we believe that we adapted well to the circumstances and were able to positively impact the community. Both returning and new members were able to stay engaged throughout the year and responded positively to being volunteers at our different events. We also witnessed significant growth in our members who, throughout the year, got more comfortable suggesting ideas for our various initiatives. All in all, Outreach 2020-2021 had a unique and productive year. We earnestly look forward to seeing next year’s committee build upon our work as they bring our chapter’s outreach efforts back in person.
Figure 12: Photos from Outreach 2020-2021. From the top heading downward to the right: (a) College Conversations workshop email banner (VI.2), (b) SDFSE Powerpoint presentation (VI.9), (c) innate immune system game from SDFSE workshop (VI.9), (d) adaptive immune system videogame level from SDFSE workshop (VI.9), (e) BMES x BEGS grad panel screenshot (VI.4), (f) Torrey Pines High School bioengineering presentation screenshot (VI.6), (g) Outreach committee meeting screenshot.

VI.1: CSU/UC Application Workshop for Upward Bound High Schoolers

*Audience: High Schoolers in the Upward Bound Program*

*Volunteers: BMES Officers*

In the fall, UCSD BMES volunteered at an online CSU/UC Application Workshop for high school seniors. The workshop was being hosted by the directors of the Upward Bound program in Fresno County whose mission is to empower underprivileged and underrepresented youth to succeed in college. Representatives from our chapter’s Officer Team attended the workshop to act as mentors answering any questions the students had about specifically the UC application.
Each of our volunteers was placed in a Zoom breakout room and the seniors applying to UCs were split amongst them.

<table>
<thead>
<tr>
<th>UC Application Workshop</th>
<th>Date</th>
<th># of Volunteers</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11/07/2020</td>
<td>7 Volunteers</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>10:00 – 11:30 AM</td>
<td>40 High School Seniors</td>
<td></td>
</tr>
</tbody>
</table>

**VI.2: College Conversations**

*Audience: High School Students Interested in College*

*Volunteers: BMES Outreach Committee Members*

At the end of Fall and throughout Winter we hosted a series of live online Q&A sessions with the goal of answering questions current high school students might have about college. Volunteers from our committee co-hosted an hour-long Zoom meeting centered around specific topics such as what a college schedule looks like or how to pick a major. In these meetings the volunteers would share their experiences with the topic as well as answering any questions the high schoolers had. To reach our audience we contacted high school teachers in the San Diego area to spread word of our sessions to their students. Committee members also contacted the high schools they attended. Each session was attended by around 5-10 high school students and a total of 89 students signed up on our interest form.

**Table 7: Summary of 2020-2021 College Conversation Logistics**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
<th># of Volunteers</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC Applications</td>
<td>11/15/2020</td>
<td>2</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>11:00 AM – 12:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Life</td>
<td>11/18/2020</td>
<td>3</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>5:30 – 6:30 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UCSD Colleges</td>
<td>11/20/2020</td>
<td>2</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>5:00 – 6:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC Applications</td>
<td>11/22/2020</td>
<td>3</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>11:00 AM – 12:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Culture and Experience</td>
<td>01/31/2021</td>
<td>4</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>2:00 – 3:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transitioning into College</td>
<td>02/05/2021</td>
<td>3</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>2:00 – 3:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing a College Mentality</td>
<td>02/14/2021</td>
<td>2</td>
<td>$0</td>
</tr>
</tbody>
</table>
VI.3: EDGE Bioengineering Workshop

*Audience: High school girls in grades 9 through 12 interested in pursuing engineering*

The UCSD chapter of the Society of Women Engineers (SWE) hosts a yearly mentorship program called EDGE (Empowerment and Development for Girls in Engineering) aimed at encouraging young girls to pursue opportunities in engineering and STEM-related careers. Several members of BMES served as mentors to high school (HS) girls, and BMES hosted an event in January, presented to the entire program. The girls were given information on current exciting advancements in the field of bioengineering, and six BMES members took part in a student panel through which the attendees could ask questions about the field or about college life. The second half of the event was devoted to an interactive activity, in which the girls worked in groups to analyze genetic data from a tumor to determine its driving mutations and recommend potential treatment options.

<table>
<thead>
<tr>
<th>EDGE Bioengineering Workshop</th>
<th>01/14/2021</th>
<th>6 Volunteers</th>
<th>90 HS Attendees</th>
<th>Cost: $0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4:00 – 6:00 PM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VI.4: Graduate Student Panel – Post Undergraduate Pathways

*Audience: All UCSD Undergraduates*

*Panelists: Graduate Students from the Bioengineering Graduate Society*

At the start of Spring the Outreach Committee partnered up with the Bioengineering Graduate Society (BEGS) Outreach Team to host an hour-long panel on options for undergraduates after they obtain their bachelor’s degree. Panelists consisted of current bioengineering graduate students from BEGS who had a wide range of post-undergraduate experiences. BMES Outreach members moderated the discussion and students asked a variety of questions relating to matters such as PhD programs, working in industry, taking a gap year and more.

<table>
<thead>
<tr>
<th>Graduate Student Panel – Post Undergraduate Pathways</th>
<th>04/02/2021</th>
<th>3 Panelists</th>
<th>35 Attendees</th>
<th>Cost: $0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2:00 – 3:00 PM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VI.5: Pathways in Bioengineering Presentation for Leigh HS STEM Night  
*Audience: Leigh High School Students Interested in Bioengineering*  
*Volunteers: BMES Outreach Committee Members*

Leigh High School reached out with interest in UCSD’s bioengineering program. Co-chairs and volunteering members of outreach came together outside of Outreach meeting times to put together a nice presentation about the 4 different bioengineering tracks at UCSD. We prompted students to choose their favorite track and ask questions about the major and research topics.

<table>
<thead>
<tr>
<th>Leigh High School Presentation</th>
<th>04/04/2021 5:00 – 6:00 PM</th>
<th>4 Outreach Members 25 HS Attendees</th>
<th>Cost: $0</th>
</tr>
</thead>
</table>

VI.6: Pathways in Bioengineering Presentation for Torrey Pines HS  
*Audience: High Schoolers in Torrey Pines HS Intro to Biotechnology Course*  
*Volunteers: BMES Outreach Committee Co-Chairs, Representatives from Other UCSD Bioengineering Student Organizations*

Torrey Pines High School reached out to us and other UCSD bioengineering organizations showing interest in learning about the bioengineering field. Co-chairs and volunteering members of outreach came together outside of Outreach meeting times with chairs of ISPE, EWH, and UBIC to put together a nice presentation about bioengineering in general. Key research projects at UCSD were mentioned to give real-life examples of bioengineering for students. The rest of the panel consisted of an open Q&A session, where many students asked many questions about research opportunities, course load, and other topics.

<table>
<thead>
<tr>
<th>Torrey Pines High School Presentation</th>
<th>05/05/2021 2:00 – 3:00 PM</th>
<th>2 Outreach Members 2 UCSD BENG Org. Representatives 35 HS Attendees</th>
<th>Cost: $0</th>
</tr>
</thead>
</table>

VI.7: Faculty Panel – Graduate School and Pursuing Academia  
*Audience: All UCSD Undergraduates*  
*Panelists: UCSD Bioengineering Professors*

The BMES Outreach team reached out to professors in the Bioengineering Department to assemble a panel centered around going to graduate school and pursuing careers in academia. Given that a good number of graduating seniors had accepted graduate school offers, the start of May was the ideal time to host such a panel, but all UCSD undergraduates were invited to attend. Three faculty members ended up signing up to be panelists and they shared how they
ended up at their current position at UCSD. Attendees asked questions revolving around funding, starting a lab, best practices for graduate school and more.

<table>
<thead>
<tr>
<th>Faculty Panel: Graduate School and Pursuing Academia</th>
<th>05/07/2021 2:00 – 3:00 PM</th>
<th>3 Panelists 24 Attendees</th>
<th>Cost: $0</th>
</tr>
</thead>
</table>

**VI.8: Project EngINE**  
*Audience: Middle Schoolers in Life Science/Engineering Classes*  
*Volunteers: BMES Outreach Committee Members*

Project EngINE (Engineers Inspiring New Engineers) is our ongoing initiative to create lesson plans and demos to teach middle schoolers about a given scientific topic in an engaging way. This year we started a lesson plan to teach students about heart physiology and how some common heart dysfunctions affect said organ. Our members put together a presentation and worked on generating 3D heart models from open source chest CT scans. While this project has not been completed, the end goal would be to make animated 3D models of the heart in a healthy state as well as in various states of dysfunction.

<table>
<thead>
<tr>
<th>Project EngINE – Heart Physiology</th>
<th>Ongoing Project Presentation Date: TBD</th>
<th>10 Project Members</th>
<th>Cost: $0</th>
</tr>
</thead>
</table>

**VI.9: San Diego Festival of Science and Engineering**  
*Audience: Elementary & Middle Schoolers in Life Science/Engineering Classes*  
*Volunteers: BMES Outreach Committee Members + volunteering BMES Officers*

Every year, BMES Outreach hosts a booth at the San Diego Festival of Science and Engineering (SDFSE) on a bioengineering topic of their choice that caters to a wide age range of students. This year the event was hosted online, and our committee chose to present about the immune system to educate kids about how their body handles pathogens and vaccines.

To make this event more interactive, we designed HTML video games for the students to play: one for the innate immune system and the other for the adaptive immune system. Committee members were split into two teams and collaborated to design levels, draw art, and model animations for each game. All members worked on the presentation, and most members additionally got the chance to present during the festival.

| San Diego Festival of Science and Engineering | Four 30-minute sessions 05/01/21 – 05/02/21 | 4 Presenters Per Session | Cost: $0 |
Section VII: Mentoring Activities

The mentorship program focuses on fostering a close relationship between upperclassmen and underclassmen. Our goal of this program is to provide our new members with individualized attention from our successful juniors and seniors along with an entire support system that will allow both groups to develop lifelong skills and help them be successful. This was particularly important in this year’s pandemic and virtual school environment, as it was more difficult for freshmen to meet new people and engage with the organization. As such, their mentors served as a point of contact to allow them to be introduced to new friends and ask any questions they might have about getting involved in BMES. Each pairing is handpicked with careful considerations of their personal and professional interests in addition to their particular focus within Bioengineering. With nearly 80 participating members, we were able to match one mentor to 1-2 mentees and place all pairings in our family system. This year, we had a 1:1.8 mentor to mentee ratio, allowing mentors to focus on a select few mentees while mentees could have a co-mentee if they wished, which has often served as the basis for lasting friendships. The family system consists of 3 families, named after the founding fathers of UC San Diego’s Bioengineering Department: Dr. Yuan-Cheng Fung, Dr. Marcos Intaglietta, and Dr. Benjamin W. Zweifach. This family system allows members to familiarize themselves in smaller, casual settings outside of the larger BMES events. Throughout the year, our families engage in a variety of friendly competitions such as the previously mentioned tournaments, spending time with their mentorship group and family, and challenge events. Through the mentorship program, we hope to help our members familiarize themselves with the new school environment, help them build their network with future colleagues, and cultivate early professional development.
VII.1: Mentorship Biographies Facebook Page

Meeting new people as a new student was always intimidating; during the pandemic this became even more difficult, as there were no in-person events to be able to personally connect with others. As such, there were much fewer opportunities to organically meet potential mentors or mentees. To bridge this deficit, we established a Mentorship Biographies Facebook page, where the profiles of 2 to 3 available mentors were showcased daily prior to finalizing pairings. This included information on each mentor’s major, year, research interests, professional or personal goals, extracurriculars, and hobbies, plus their advice for underclassmen. By joining the group, mentees could browse the mentor profiles at their convenience and reach out to whomever they felt they might connect with. This also served as a networking opportunity for students looking to join a particular lab as well. They could look up other mentors who were currently in the lab and reach out for a connection or more information.

| Mentorship Biographies Facebook Page | 1: 1.8 Mentor to Mentee Ratio | 78 members; 29 biographies | Cost: $0 |

VII.2: Mentorship Speed Dating

Before the mentorship group selection process, the program began with a virtual speed dating event so the upcoming mentors and mentees could familiarize themselves with one another. The event involved rotating groups of mentees in breakout rooms to meet different mentors, with whom they would answer prompted questions designed to acquaint the fellow students.
this event, students could request specific mentors or mentees in the hopes that obtaining their choice would encourage students to devote themselves more to the mentorship program.

| Mentorship Speed Dating | 11/04/2020 8:00 – 9:00 PM | Attendees: 30 | Cost: $0 |

**VII.3: Mentorship Reveal**  
*Audience: Members of the UCSD BMES Family System*

Mentorship Reveal is a large-scale event meant to introduce underclassmen mentees to their upperclassmen mentors. This created an enthusiastic atmosphere for the initial encounter of mentor to mentee, to kick start a smooth transition into a strong relationship. Adapting to a virtual platform, we hosted a “Guess Who” themed Mentorship Reveal on Zoom to introduce an element of interactiveness and keep participants engaged. Using survey data from each of the mentors, each mentee was given a profile of random facts about their mentor. Mentees were split into 3 breakout rooms based on their family designation, either Fung, Intaglietta, or Zweifach, and took turns asking the mentors yes or no questions. Then the mentees worked together to figure out who each person’s mentor was. This allowed mentors and mentees to easily start up conversations and get to know each other, both within their mentorship pairings and the rest of their social family.

| Mentorship Reveal | 11/08/2020 1:00 – 3:00 PM | Attendees: 56 | Cost: $0 |

**VII.4: How to be a Good Mentor Podcast**  
*Audience: BMES members*

In an effort to provide support to our mentors in addition to our mentees, we made a one-episode podcast where we discussed our experiences in the mentorship program as both mentors and mentees to provide insights on how our members can best be there for each other. We discussed a variety of topics, including what we enjoyed/did not enjoy in our mentors, imposter syndrome, how to connect mentees to new opportunities, and much more. This was recorded and posted to the UCSD BMES Facebook page and the BMES Mentorship Program Facebook page to allow our members to listen at their leisure.

| How to be a Good Mentor Podcast | Posted on 01/16/2021 | Attendees: N/A | Cost: $0 |
VII.5: Mentorship Challenges and Virtual Meetups

*Audience: Members of the UCSD BMES Family System*

Once our members were placed in their mentorship groups, they were encouraged to regularly meet virtually and post photos on social media for family points throughout the year. We hoped to incentivize pairings to meet and encourage others as well to increase member interactions. This year we decided to have a Winter quarter BINGO card for groups to fill out with various activities such as attending BMES events together to de-stressing with a virtual self-care night. These meetups and challenges occur from November to June and happen both virtually and in-person (when safe).

VII.6: Family Socials

*Audience: Members of the UCSD BMES Family System*

We encourage our family heads to host socials throughout the year to destress and have some fun. These socials are designed to provide members with an easily accessible community that they may become closely attached to that can provide them a desirable support system throughout the academic year. All family socials incur no cost ($0) on the end of BMES.

**Table 8: Summary of 2020-2021 Family Social Logistics**

<table>
<thead>
<tr>
<th>Event Name</th>
<th>Date and Time</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intaglietta’ Fall Study Social</td>
<td>11/15/2020 1:00 – 2:00 PM</td>
<td>9</td>
</tr>
<tr>
<td>First Zweifach Fam Social</td>
<td>11/18/2020 3:00 – 4:00 PM</td>
<td>14</td>
</tr>
<tr>
<td>Fung’s Get to Know Everyone: Buzzfeed Quiz Edition</td>
<td>12/05/2020 12:00 – 1:00 PM</td>
<td>10</td>
</tr>
<tr>
<td>Fung’s Game Social</td>
<td>01/08/2021 12:00 – 1:00 PM</td>
<td>3</td>
</tr>
<tr>
<td>Intaglietta’s Trivia Social</td>
<td>01/10/2021 1:00 – 2:00 PM</td>
<td>11</td>
</tr>
<tr>
<td>Zweifach’s Mafia Social</td>
<td>01/21/2021 1:00 – 2:00 PM</td>
<td>5</td>
</tr>
<tr>
<td>Intaglietta’s Escape Room Social</td>
<td>02/07/2021 4:00 – 5:30 PM</td>
<td>10</td>
</tr>
</tbody>
</table>
### VII.7: BMES Olympics

*Audience: Members of the UCSD BMES Family System*

The riveting end to our family competition culminated at our annual BMES Olympics, where families went head-to-head for the championship title. Through several rounds of a Family Feud tournament based on Bioengineering student survey responses, the Zweifach family emerged victorious.

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Time</th>
<th>Attendees</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fung’s Class planning Social</strong></td>
<td>02/08/2021</td>
<td>3:00 – 4:00 PM</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td><strong>Zweifach’s Baking Social</strong></td>
<td>02/19/2021</td>
<td>2:00 – 4:00 PM</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Intagliaetta’s Spring Study Social</strong></td>
<td>03/06/2021</td>
<td>1:00 – 2:00 PM</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td><strong>Zweifach’s Spring Study Social</strong></td>
<td>03/11/2021</td>
<td>12:00 – 1:00 PM</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Fung’s Gaming Social</strong></td>
<td>03/13/2021</td>
<td>3:00 – 4:00 PM</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>BMES Olympics</strong></td>
<td>05/08/2021</td>
<td>2:00 – 4:00 PM</td>
<td>Attendees: 21</td>
<td>Cost: $0</td>
</tr>
</tbody>
</table>
Section VIII: Industry and Professional Development Activities

UCSD BMES aims to promote technical and professional development via research, academic and networking opportunities for undergraduate students interested in biomedical engineering. This mission was accomplished through workshops, project cycles, undergraduate/graduate talks, and a design project, all led by our Project Team committee. This team met approximately weekly for an hour, with 10-20 undergraduate students working together to plan the separate aspects of the Project Team. Furthermore, we have continued the design project team from last year (now called SURGEO), which met every weekend since school started for one to three hours. This mission was also fulfilled through a variety of professional development events planned by the BMES executive board and through collaborations with the UCSD Bioengineering department and other undergraduate organizations. These events provide undergraduate students with leadership skills, access to jobs and internships in bioengineering as well as opportunities for professional development and industry networking. These events include individual company informational sessions, workshops, and the Bioengineering Career Fair.

VIII.1: Project Team Workshops

*Audience: All BMES members*

This year, Project Team aspired to be more diverse in the workshops they offered. To do so, they expanded their workshops to encompass all four major bioengineering focuses and included programs with the aim of developing soft skills in addition to the traditional technical skills, which have been the primary focus of workshops hosted by previous iterations. Most workshops last one to three hours and are designed to guide a person with no working experience with the skill to feel comfortable learning more on their own. All workshops incurred no cost. Project Team’s first soft skill workshop of fall quarter was done in collaboration with the Translational Medicine Day committee. We wanted to give advice and help students gain experience with pitching themselves, especially during prime job/internship hunting season.
The first half of the workshop consisted of sharing pitching tips and ways to feel less stressed during a talk. The second half of the workshop was a fun exercise based on the game “Red Flags” in which students were given 2 strengths and 1 weakness with which they attempted to spin a story explaining why they were a good friend.

| Pitching Workshop | 10/29/2020 | Attendees: 12 |

Project Team’s first technical workshop of fall quarter was, by popular demand, to teach students how to use the computer aided design (CAD) program SolidWorks. Students were taught the basics of CAD software and what to consider when making a design. They were then taught how to create a keychain with working gears based on the Project Team logo and how to create an animation of the keychain.

| SolidWorks Workshop | 11/06/2020 | Attendees: 19 |

The second soft skill workshop of fall quarter was focused around teamwork and communication. Students were split into teams of 4 or 5 and were tasked with creating a new logo and slogan for any of UCSD colleges, including the new Seventh college. After finishing their designs and slogans, each team gave a small presentation of their group efforts. The winning one is the picture following this section’s abstract featuring the Sixth College Raccoon God.

| College Logo Design Competition Workshop | 11/12/2020 | Attendees: 12 |

The second technical workshop of fall quarter was to teach students introductory level Python dataframe manipulation and data science in the format of a Pokémon treasure hunt. Students were taught how to use Jupyter notebook, Python packages such as Pandas and numpy, and basic data analysis tools and concepts like the student t-test.

| Python Dataframe Workshop | 11/20/2020 | Attendees: 16 |

The last soft skill workshop of the fall quarter was on critical thinking. We gave tips on how to improve critical thinking and then gave students a question from the website “What If?” which had many hypothetical and seemingly absurd scientific questions. We worked as a group to solve the what-if question: how much helium should be needed and how fast the car should move to enable a “flying chair” attached to a moving car? While these questions were resolved with our physics knowledge, we also proposed new designs to improve the ridiculous situations posited.

| What-If Critical Thinking Workshop | 12/03/2020 | Attendees: 8 |

This workshop was a continuation of the SolidWorks workshop from the fall quarter. Students were taught how to conduct finite element analysis to test their 3D models and see how they would react to various physical conditions. In this workshop, a model of Geisel Library was used to teach how to check the aerodynamic profile of Geisel and its reaction to a strong earthquake.
Finite Element Analysis Workshop 01/25/2021  Attendees: 8

This workshop was created to further prepare students for the Bioengineering Career Fair. The topic of the workshop was like the earlier Pitching Workshop but differed in that this workshop focused on the content of the pitch, whereas the Pitching Workshop focused on how to properly convey thoughts. We also shifted the gears to help communicating less technical experiences but more transferable ones to prepare first and second year students better.

Professional Experience Communication Workshop 02/01/2021  Attendees: 5

The second technical workshop of winter quarter was focused on circuits and MATLAB. Students were provided with noisy ECG datasets, learning to apply band pass filters to acquire cleaner bio-signal data. Due to COVID-19, we were unable to teach students how to use Arduino to actually build the circuit. Instead, we went over the basics of second-order band pass filter circuitry to help students understand the mathematics simulation with MATLAB Simulink.

MATLAB Circuit Simulation Workshop 02/26/2021  Attendees: 10

We hosted this soft-skill workshop with dinosaur origami making to practice active listening and bring chances of bonding among members. Members were divided into groups of 2, 1 had access to an instruction video, “brain”, and 1 has a piece of paper, “hand”. “Brain” described steps and “hands” carried out the steps. People of both roles needed to actively listen to each other, verbally and nonverbally, to finish the task.

Dino Origami Active Listening Workshop 04/16/2021  Attendees: 5

To improve students’ biotech research skills and mindsets, we presented the experimental design workshop based on the model of early-onset familial Alzheimer's disease. We discussed and practiced designing research solutions with biotechnology, including CRISPR, in vitro assays, and in vivo models commonly used in the lab.

Experimental Design Workshop 05/14/2021  Attendees: 9

VIII.2: Undergraduate Talks (BEinspired/BEinformed)

Audience: All BMES members

The purpose of our BEinformed talks was to give Project Team committee members a platform to practice developing soft skill development in a “low stakes” environment. The members who sign up for these talks would deliver a presentation on an article related to biomedical engineering research that they found interesting to share at our meetings. These talks took up an average of 10-20 minutes depending on the subject and were followed up with questions from other curious members along with a group discussion. Our BEinspired talks had a very similar
format but were given by our undergraduate members to speak about their research or industry experiences and how these were obtained. The goal of these talks was to show members that their peers and our alumni can serve as guides and resources to each other. We have incorporated these talks into a couple of our Zoom meetings this year. These incurred no cost.

<table>
<thead>
<tr>
<th>Yifan Lin, BEinformed</th>
<th>02/08/2021</th>
<th>Attendees: 7</th>
</tr>
</thead>
</table>

In this BEinformed talk, Yifan shared a research paper written by Dr. Stanley Lo, which is focused on applying graph theory to examine the dynamics of student discussions in small-group learning.

<table>
<thead>
<tr>
<th>Michael Bennington, BEinspired</th>
<th>03/01/2021</th>
<th>Attendees: 6</th>
</tr>
</thead>
</table>

In this BEinspired talk, Michael shared his college career experiences, including his visions, course/major/minor choices, student organization involvements, projects, and internships.

#### VIII.3: Project Cycles

**Audience: Paid BMES members**

Under normal circumstances, Project Team has worked with graduate students, postdocs, and professors to find students to fill in open lab positions. Our role was to provide our members a description of the position(s), create an application, collect resumes, interview the applicants, and forward our thoughts on each applicant to the graduate student or professor. Due to COVID-19, we were unable to prepare project cycles or work with professors who were interested in working with us for most of this academic year until Spring Quarter. With the gradual decrease in COVID-19 restrictions, Project Cycles were once again a potential avenue of opportunities, and the Project Team Committee was able to open two Project Cycles over the course of Spring Quarter. Project Cycles were faculty-sponsored, and they did not incur any cost on UCSD BMES.

#### VIII.3.1: Project Cycle 1 – Dr. Robert Saddawi Konefka

Dr. Robert Saddawi-Konefka works at the Moores Cancer Center as a postdoctoral researcher and resident physician in otolaryngology and head and neck surgery. He was looking for a volunteer undergraduate to help with tissue culture work, bench work, *in vivo* mouse experiments, and experimental design with several exciting immune-oncology projects. He was happy to take on anyone and train them if they were motivated and could commit to coming into the lab regularly. Ideally, this individual would have a working knowledge of molecular biology and immunology and some experience working in a lab. Of the five applicants for this position, Dr. Saddawi-Konefka ended up selecting one of them for this project cycle.

#### VIII.3.2: Project Cycle 2 – Dr. Shweta Joshi
Dr. Shweta Joshi at Moore’s Cancer Center was looking for one or two transfer/junior students or graduating seniors with no research experience who were planning on completing their PhD in oncology or immunology related areas. Basic knowledge of the immune system and cancer before joining the lab would be helpful. This was a year-long, volunteer, and in-person position that would start in late May and span all of summer. There would be plenty of opportunities to gain experience working with in vivo and in vitro models. There are currently three applicants vying for the position, and Dr. Joshi is still working on interviewing the candidates to see which person best fits on her team.

VIII.4: Design Project – SURGEO

Audience: All interested BMES members

Design project SURGEO was rebranded from DEBUT from last year’s Project Team. We started off in the summer of 2020 to build a tele-surgical robot, dividing into 3 teams: mechanical team, telecommunication team, and tracking team. By hosting weekly zoom meetings, we studied together and documented our progress in a shared Google Drive. Over the course of this academic year, we have included 30 members in this project, with 10 core members contributing to robotics design, telecommunication system development, and tracking technology applications to the project.

- In the mechanical team, we began with research on robotic wrists, then created many hand-drawn designs before applying Fusion 360 to create a rough design for main parts of the robot.

- In the telecommunication team, we first adopted port forwarding and Python package socket to enable remote text communication. Making the codes more robust, we enabled a live video stream transfer with pickle and video display with cv2.

- In the tracking team, we researched many different variations of motion tracking technologies before deciding to apply Python package mediapipe to track the hand and each individual joint.

Ideally, we should learn about inverse kinematics to help the robot know where to move to strengthen the system. After integrating the telecommunication and tracking systems, we enabled remote live hand movement tracking of the wrist, thumb tip, and middle fingertip.

Due to COVID, we could not finish the integrations and testing of the mechanical, telecommunication, and tracking systems. We decided to limit the project to 2 years to best encourage involvement and provide a great learning experience for both new and experienced students. We’ve created a full project documentation of all teams for future reference, including periodic progress, technical details, and possible improvements. We would like to give a special thanks to our design team leads Vincent Zee, Aayush Somani, and Jay Chen.
VIII.5: Summer Leadership Workshop Series

Audience: BMES Officer Board

The pivot to a virtual setting has been challenging to all our students. BMES at UC San Diego prides itself on incredible leadership and setting high standards of professionalism from the top down within our organization. As such, the Executive Board hosted four virtual leadership workshops over the summer for our incoming Officer Board to educate members on leadership skills, professionalism, and ethics to ensure our standards were clearly communicated and all were prepared for the coming year. All workshops incurred no cost to BMES.

VIII.5.1: Leadership Styles

The first workshop of this series focused on unpacking the various types of leadership that exist and asking all officers to describe what they believed makes a “good” leader. From here, we developed community leadership goals to strive for, including proactive listening, inclusivity, flexibility, and trust. We then discussed the strengths and weaknesses of various leadership styles and concluded with an interactive activity that combined officers with different leadership styles together to collaborate on a task.

| Leadership Styles | 08/12/2020 | Attendees: 19 |

VIII.5.2: Communicating as a Leader

This workshop aimed to build our officer’s communication skills, including verbal, nonverbal, visual, and written forms. As a group, we practiced effective communication in various contexts, from an elevator pitch to an industry member to a professional email to a professor to a conversation with an incoming student. We emphasized the importance of authenticity, transparency, and active listening as key components of effective communication.

| Communicating as a Leader | 08/26/2020 | Attendees: 19 |

VIII.5.3: Diversity in Leadership

This workshop was the longest in our series. In a safe community space, we discussed difficult topics, including unconscious bias, racism in higher education, and gender discrimination within engineering. We did our best to educate our officers on inclusive communication, specifically as it relates to gender identity and pronouns. We had detailed discussions about neurodiversity, with emphasis on inclusion of members on the autism spectrum and members with anxiety or depression. As a group, we discussed strategies to ensure all members of our organization feel they belong within our community and are respected regardless of their background.

| Diversity in Leadership | 09/10/2020 | Attendees: 19 |
VIII.5.4: Leadership in a Virtual Setting

The transition to virtual learning has been challenging. As such, we hosted a separate workshop devoted to discussing leadership skills in a virtual setting. Our officer board discussed strategies for inclusion of members in different time zones and those living at home. We commented on the need for ‘mental breaks’ during virtual meetings, and ways to encourage participation from those hesitant to turn their video cameras on.

| Leadership in a Virtual Setting | 09/19/2020 | Attendees: 19 |

VIII.6: Informational Sessions

*Audience: All UCSD students*

As per tradition, UCSD BMES hosts several informational sessions each year to broadcast a variety of opportunities in biomedical engineering industry and graduate school pursuits, and this year was no different. During these sessions, company and graduate school representatives were invited to a Zoom call hosted by our Vice President External to present the work done by their companies and researchers, as well as the opportunities that they offered for students. Students had the ability to talk to these representatives and learn what steps they would need to take to gain access to these opportunities. These informational sessions were planned and executed in coordination with other undergraduate bioengineering organizations at UCSD. These info sessions incurred no cost on the end of BMES.

**Table 9**: Overview of 2020-2021 Professional Informational Sessions

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>Date</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genentech</td>
<td>10/5/2020</td>
<td>15</td>
</tr>
<tr>
<td>Medtronic</td>
<td>10/7/2020</td>
<td>20</td>
</tr>
<tr>
<td>Cornell Bioengineering Department</td>
<td>11/13/2020</td>
<td>25</td>
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</tbody>
</table>

VIII.6.1: Genentech Info Session

BMES at UC San Diego co-hosted an information session with Genentech, a biotechnology and pharmaceuticals company headquartered in San Francisco. Genentech representatives shared information about their internship opportunities and Outstanding Student Award of $2,500 available for undergraduate students.
VIII.6.2: Medtronic Info Session

The UC San Diego Department of Bioengineering prides itself on its close ties with Medtronic, a medical devices company. BMES at UC San Diego co-hosted an information session on October 7th at which Medtronic representatives shared information about their summer internship program and application cycle.

VIII.6.3: Cornell Info Session

Several members of BMES at UC San Diego are curious about graduate school. As such, we hosted an information session with the Cornell Bioengineering Department to share information about their MEng and PhD programs. Professors, department coordinators, and UCSD alumni at Cornell shared their experiences with current BMES students to encourage our members to pursue advanced academic degrees.

VIII.7: Collaborative Professional Development Programs

Audience: All UCSD students

Several of the professional development workshops hosted by UCSD BMES are done in coordination with other organizations and committees. These collaborative events broaden our outreach efforts to bring resources to new communities while fostering an environment of interdisciplinary and cross-organization collaboration for the future.

VIII.7.1: Time Management Workshop (Co-Hosted with QL+)

For our first skills workshop of the quarter, BMES at UC San Diego hosted a time management workshop alongside Quality of Life Plus (QL+), a fellow engineering student organization at UCSD. We scheduled this workshop to occur at the beginning of the quarter to better target incoming freshman and transfer students. During this workshop, we shared academic resources available within the Jacobs School of Engineering and community resources through our diversity centers at UC San Diego. We emphasized the importance of prioritizing mental health for new students and held a student panel through which current engineers shared their tips and tricks with incoming students. Lastly, we concluded with a small-group scheduling workshop to help incoming students plan out their schedules for the quarter.

<table>
<thead>
<tr>
<th>Time Management Workshop w/ QL+</th>
<th>10/08/2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendees: 13</td>
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</table>

VIII.7.2: Bio Chalk Talk #1 with Dr. Stanley Lo (Co-Hosted with UBIC)

Chalk Talks are seminar-style events organized by the Undergraduate Bioinformatics Club (UBIC) in which speakers talk about their research and their involvement in the field of bioinformatics/biology. We invited Dr. Lo, an associate teaching professor in the division of biological sciences. His talk is on applying graph theory to examine the dynamics of student
discussions in small-group learning. Combined with qualitative data on student cognitive engagement, he is examining how to best promote equitable collaborations.

| Bio Chalk Talk #1 w/ UBIC | 02/03/2021 | Attendees: 12 |

VIII.7.3: Bio Chalk Talk #2 with Dr. Dr. Gulcin Pekkurnaz (Co-Hosted with UBIC)

For the second Bio Chalk Talk collaboration with UBIC, we invited Dr. Pekkurnaz, an assistant professor in the division of neurobiology, to share her insight. Her research is on the molecular principles of metabolic homeostasis in the nervous system. By studying the interplay between neuronal metabolism and mitochondrial functions across cell classes, she aims to reveal fundamental insights into the mechanisms that regulate cellular bioenergetics and pinpoint the underlying causes of energy impairments that lead to neurological diseases.

| Bio Chalk Talk #2 w/ UBIC | 03/01/2021 | Attendees: 12 |

VIII.7.4: LinkedIn Workshop (Co-Hosted with New Student Committee)

This workshop run in collaboration with the BMES New Student Committee was targeted towards new students to share information about LinkedIn - including how to create a profile, apply for jobs, and successfully network with industry professionals and alumni using the site. Students were given the opportunity to receive peer-review feedback on their own profiles, and to practice creating personalized connection requests using the platform.

| LinkedIn Workshop w/ NSC | 04/12/2021 6:00 – 7:00 PM | Attendees: 15 |
VIII.8: Jumpstart January

Audience: All BMES Members

To best prepare members for a flurry of professional events occurring in January and February, BMES hosted Jumpstart January - a collection of events at the beginning of Winter Quarter focused on building our member's professional portfolio. This included the following events:

- Leveling Up to Lab Expo (01/15/2021, III.1)
- Dipping Your Toes into Research (01/22/2021, VIII.8.1)
- Resumé Review Workshop (01/27/2021, VIII.8.1)
- Lab Expo (01/29/2021, III.1)
- Professional Experience Communication Workshop (02/01/2021, VIII.1)
- Virtual Networking: Intro to Remo Platform (02/09/2021, VIII.8.1)
- Bioengineering Career Fair (02/10/2021, VIII.9)

More detailed information regarding each program can be found in their associated section bolded within the parentheses. Below, we discuss three events that were planned specifically for assisting our BMES members with their journey of professional development leading up to the large annual events of Lab Expo and the Bioengineering Career Fair.

VIII.8.1: Dipping Your Toes into Research

The Dipping Your Toes into Research Workshop was borne from the high volume of interest that students had regarding undergraduate research positions and the lack of clarity in obtaining one, especially leading up to important professional events. The New Student Committee collaborated with Lab Expo to create a Q&A panel of students that held or were holding undergraduate research positions to answer questions and give advice to new students. This panel informed students about the best ways of learning what kind of research is being done, how to approach professors about obtaining a position that they are interested in, and the different types of work that students are exposed to within these positions.
VIII.8.2: Resumé Review Workshop

When searching for a job or summer internship, one’s resumé serves as the company’s ‘first impression’ of a candidate. As such, this workshop aimed to provide guidance for students regarding resumé formatting, contents, and personalization. We emphasized the importance of transferable skills - of particular use for new students and students who lost in-person research and internship experiences due to COVID-19. We then provided a peer review, during which each attendee had a one-on-one session with an experienced upperclassman or graduate student to receive personalized feedback.

VIII.8.3: Virtual Networking – Intro to Remo Platform

This workshop prepared students for the new world of virtual networking in advance of the Bioengineering Career Fair. Specifically, this event introduced the networking platform REMO and shared virtual networking tips with students to maximize their experience at future events.
VIII.9: Bioengineering Career Fair

*Audience: All UCSD undergraduate and graduate students*

The Bioengineering Career Fair is an annual collaboration between the UC San Diego Department of Bioengineering and the bioengineering student organizations of UCSD BMES, Bioengineering Graduate Society (BEGS), International Society for Pharmaceutical Engineering (ISPE), and Undergraduate Bioinformatics Club (UBIC). This event is a unique opportunity for UCSD bioengineering students to network with companies regarding summer internships and future employment opportunities. This year, due to the pandemic the event was hosted using the virtual networking platform REMO - allowing students to speak in small group and one-on-one settings with industry representatives. Due to the virtual nature of this event, UCSD was able to connect with companies located outside of San Diego, including the UC Santa Cruz Genomics Institute. Before the event, a detailed guide was provided to attendees with information about each participating company and instructions to create a profile through REMO. An optional resume collection form was offered to all attendees to be distributed to all participating companies - 192 student resumes were collected and distributed through this system. Because this event was funded by the UCSD Department of Bioengineering, there were no associated costs for running this event to UCSD BMES. A post-event survey was conducted for student and company attendees. Here are some highlights:

- 100% of attendees surveyed plan to attend the BENG Career Fair in the future or recommend it to others

- 100% of students and 95% of company representatives surveyed rated the event as “successful” or “very successful”

- 100% of students surveyed believed taking part in career fair helped improve their networking skills, and 79% believed this event specifically will help them find a job in the future

- Here are some highlighted comments from the feedback form:
  - “The virtual conference room (different floors, tables, etc) made it very easy and enriched the experience.”
  - “I felt this was an effective use of my time and the student’s time.”
  - “I was able to talk to a number of students [and] the students were well-prepared.”
  - “I actually preferred it to an in person event and found it a little less intimidating”
  - “A very user-friendly, professional, yet fun interface to network with company representatives!”


VIII.10: Conversations with Faculty

** Audience: All UCSD Undergraduates  
** Panels: UCSD Bioengineering Professors

One of the new initiatives pursued by this year’s Executive Board came from an idea from the first of our Town Halls with the Bioengineering Department, in which students requested that professors give real-world context for careers that take advantage of the material we learn in class. After discovering it to be of great interest to the student body, both the Bioengineering Department and UCSD BMES agreed to host a series of Conversations with Faculty for the different Bioengineering tracks during this academic year. While we ended up only being able to schedule two of the four planned events, students valued the context that these conversations provided to their class material, so we foresee this series continuing in future iterations.

**VIII.10.1: Conversations with Faculty – Bioengineering**

Towards the middle of Winter Quarter, BMES hosted a panel discussion with professors in the department about the Bioengineering: Bioengineering major. Faculty talked about their path through academia, their research, and how their research relates to the topics that BENG: Bioengineering students learn in their core classes. BMES executive board members moderated the conversation, and students were able to ask questions to the four different professors.

**Conversations with Faculty – Bioengineering | 02/17/2021 | 4 Panelists 30 Attendees**

**VIII.10.2: Conversations with Faculty – Biotechnology**

Near the beginning of the Spring Quarter, BMES hosted another panel discussion with professors about a bioengineering major. This quarter, the Bioengineering: Biotechnology major was discussed, and faculty from multiple departments were invited. Once again, professors talked about their research, how they got to their current position, and related their work to the subjects Biotechnology students learn. This conversation also worked to highlight the interdisciplinary nature of biotechnology with faculty from different engineering disciplines. The conversation was again moderated by the BMES executive board, and students were able to ask the faculty panel questions directly or through the general chat.

**Conversations with Faculty – Biotechnology | 04/28/2021 | 2 Panelists 25 Attendees**
VIII.11: Switching into Bioengineering

*Audience: All students interested in changing their major to a bioengineering track or becoming more involved with bioengineering student organizations*

In this event, we aim to explain both the how and why students should consider switching into bioengineering. The event featured a keynote speech from Elizabeth Soos, the UCSD Bioengineering Advisor, who gave a presentation regarding the various tracks in the Bioengineering Department to better paint a picture for what each track specializes in. Furthermore, her discussion included the general history of the bioengineering department and introduced the potential future careers of a bioengineer after graduation, highlighting various career pathways like medicine, corporate, entrepreneurship, and more. Finally, the presentation was concluded with a thorough discussion of the prerequisites, logistics, and statistics of prospective bioengineering students looking to switch into the major.

| Switching into Bioengineering | 04/30/2021 4:00 – 6:00 PM | Attendees: 23 |

VIII.12: KGI Cell Therapy Bootcamp

*Audience: All UCSD undergraduate students*

In collaboration with the UCSD chapter of AIChE (American Institute of Chemical Engineers), UCSD BMES hosted an interactive cell therapy bootcamp with the Keck Graduate Institute. KGI professors shared their expertise in the fields of bioprocessing, cell therapy design, and biopharmaceutical manufacturing. Participants worked in groups to research novel CAR T therapies and present their findings. A representative from KGI admissions also shared information about their relevant MEng programs and summer workshops.

| KGI Cell Therapy Bootcamp | 05/12/2021 | Attendees: 34 |
Section IX: National BMES Meeting

The BMES chapter at UC San Diego was incredibly honored to attend the BMES national conference as recipients of the Outstanding Chapter Award for the 2019-2020 school year. As such, our conference attendees were excited to showcase the strength of our chapter programs and learn from other student chapters to further improve the experiences we offer to our members.

It is tradition for the UCSD BMES officer board to attend Nationals as a group to ensure all officers can benefit from the research presentations, graduate school booths, and networking opportunities. Despite BMES Nationals being in a virtual setting this year, this tradition continued this year, and we were excited to bring all 19 members of our Fall Officer Board to the event due to generous funding from the UCSD Bioengineering Department and our faculty advisor, Dr. John Watson. As part of the Outstanding Chapter Award for 2020, we were also awarded four additional free tickets to attend BMES Nationals - these were given to general BMES members through an application process, allowing four underclassmen students to experience the convention and gain valuable networking experience.

When not attending research talks or poster sessions, our officer board split their time between our BMES chapter booth and the UC San Diego department booth. At the chapter booth, we shared information about our mission, committees, and events. In particular, our officers highlighted their incredible work in spring of 2020 to pivot in-person events to a virtual setting without sacrificing quality or outreach. We made valuable connections with several undergraduate chapters, including UCLA and Duke University, through this virtual booth.

During BMES Nationals, our VP External spoke on a student panel entitled “How to Make the Best of a Mess - Turning Chapter Programs Virtual.” She spoke about several of the chapter’s virtual programming events, including Bioengineering Day 2020 and our College Conversation series with California high school students. BMES at UC San Diego was honored to serve on

Figure 13: Our banner used during the National BMES Meeting
this panel alongside representatives of several extraordinary BMES chapters, and we look forward to future opportunities to collaborate with these chapters in coming years.

We conducted a survey of our officers after the national conference. In their own words, here were some of their experiences:

- “I thoroughly enjoyed the presentations I was able to attend - the plenary talks were all amazing and inspirational, the panels were very informative, and I got to learn more background information on...a project I am working on. I think attending the meeting, although it was virtual, was definitely a productive opportunity and motivated me to work harder”

- “I was able to watch some interesting presentations on exciting research going on throughout the country and found resources to learn more about several grad schools. I also attended a panel where leaders from different student chapters talked about what they’ve been doing during the pandemic and got some great ideas for events to host.”

- “I was able to watch a lot of interesting presentations and I was able to narrow down my potential career choices. It was also great to discover the research happening in different fields and see the different directions these fields are going towards. There were also a few graduate schools that I was able to connect with as well.”

- “The grad schools I chatted with were very informative, and their videos summed up a good amount of the questions that I had. The presentations were very well prepared and had a nice overview of the current state of research within each field covered.”

- “Learned about new technologies and what was out there (got inspired!)”

The 2021 National BMES Meeting will be taking place as a hybrid event in Orlando, Florida. While there will likely still be safety concerns regarding flying out a group of 19 students on our new Officer Board to an in-person event across the country amid the ongoing (albeit slowing) pandemic, we are incredibly eager to network with bioengineering researchers, industry professionals, students in the field, and National BMES officials under more lively circumstances in the coming year’s meeting. Whether this networking occurs virtually or in-person, we look forward to experiencing the excitement and inspiration that this bioengineering research conference will undoubtedly bring for our officers and attendees at large.
Section X: Future Direction

In the upcoming 2021-2022 academic year, UCSD BMES is eager to return to normalcy with in-person events and meetings as the main mechanism by which the organization can be an invaluable resource for undergraduate students interested in bioengineering. The COVID-19 pandemic has been both a curse and a blessing, as the virtual format of all experiences has closed traditional doors of professional development while opening other unexpected ones. This has been demonstrated by the novel adaptations made by the previous board to continue to move forward with new initiatives to help new members despite the difficulties of the remote situation. However, the new board aims to take full advantage of hybrid options of in-person and virtual methods of communication as the pandemic’s control over our daily lives slowly diminishes. Just as the previous board has transitioned the organization seamlessly into an online format, the new board plans to do the same as UCSD BMES transitions once again, this time back to an in-person world with the availability of hybrid options still present. In doing so, the new board aims to expand upon the ambition and inclusivity upheld by previous boards while actively listening and responding to student concerns and ideas by establishing open channels of communication in order to effectively provide resources for anyone interested in bioengineering. With these goals and the reasonable assumption that the pandemic will continue to die down in the coming months to allow for the safe return of in-person events, we are eager to reconnect both old and new members of our bioengineering community to once again walk the path of personal and professional development with the resources that BMES can provide, side-by-side and hand-in-hand because we can be together once again.

X.1: Maintaining the Inclusivity and Ambition of Previous Boards

During the previous year, our chapter has seen many new initiatives aimed to improve the experience of our members. Within these initiatives, there were two key pillars that the new officer board recognizes and wants to continue: inclusivity and ambition. Many initiatives were aimed at increasing inclusivity of members, regardless of the background or interests of the individual. On the other hand, our chapter also had the ambition to begin new initiatives, even while navigating an unsettling and virtual year. The new officer board will strive to retain these core driving forces and use them to grow the chapter and improve their effectiveness as we aim for a smooth transition back to in-person events.

Over the years, our chapter has continued to adapt to the needs of the students, with the officer board being at the forefront of these decisions. Prior boards changed our singular freshman representative position into two freshman reps, to increase the productivity and support of the young officers. The most recent board assessed the needs and found that our community lacked a way to welcome the transfer students, who are as new to the school as freshman are. Thus, the two freshman reps now became one Freshman Representative and one Transfer Representative. This expanded the reach of the newly named New Student Committee and created an environment that was more inclusive and aware of the struggles all new students
face, regardless of age or experience. We believe that this response to the needs of the students is critical to the member experience, and we look to build upon this idea in the next year. By being aware and responsive to the needs of our members, we look to improve their experience not only in our chapter but in their entire undergraduate experience.

A change in events that reflects the ambition of the most recent board is the establishment of the Conversations with Faculty series. These events were held for two of the four different tracks within the bioengineering department. They brought together faculty who exemplified research within those disciplines, allowing students to come and talk to them about their research and experiences. During a year when more than ever students were isolated from their professors, the ambition to establish these events helped bridge the gap between student and professor. By filling this critical niche, these events enriched the undergraduate experience of the student and allowed them to learn in ways which were not feasible before. This year, we look to capitalize on the ambition of the previous board and continue such events that allow students to gain new perspectives into the field of bioengineering.

Highlighting the inclusivity of the previous board once again, we consider the involvement of the new members of the organization. It was more difficult than ever to reach out to new members in the virtual format, yet the previous board has succeeded and went above and beyond in this. Many new students became involved in the committees of our chapter because of the inclusivity and opportunities which the chapter has offered. The new officer board aims to continue this excellent welcoming and retaining of new members in the coming year as we transition back into in-person events in order to continue to grow our community and offer our resources to anyone interested in the field of bioengineering.

**X.2: New Initiatives for the 2021-2022 Academic Year**

The pillars of the new board’s vision are two interrelated ideas: communication and community. For communication, we aim to support the student's needs by both actively listening and responding to their ideas and concerns. Secondly, in the current circumstances, as our campus transitions back to in person, we believe that now, more than ever, we need to offer a community that is safe and welcoming to all members so that they can grow both personally and professionally. Keeping these ideas in mind, the new board aims to be a resource for any individual member.

This past year has seen an increase in communication within the department, through the establishment of the Conversations with Faculty and improved Town Hall events where the officer board aimed to moderate conversation with the department about action items between the biannual events. The new board aims to continue to strengthen its communication efforts with the department. A new initiative is increased transparency of the discussion which occurs at town hall meetings. While students who feel strongly often appear at town halls, many are unable to attend the meetings. Therefore, the new board aims to establish an open channel of
communication for the rest of the chapter and the rest of the bioengineering undergraduates so that more students are aware of the discussions that happen with the department.

Internally, the new board aims to establish initiatives which will increase communication between both committees and between the officers and general chapter members. The tradition of the executive board holding office hours has become less prevalent in recent years, so the new board aims to reestablish these weekly events. These office hours are a valuable resource for members to come to us and ask for advice, communicate any concerns, or suggest new ideas, and they allow the channels of communication to remain open all year long. The new board also thinks that the event committees can increase in efficiency and member involvement if better channels of communication are established between them. By encouraging the collaboration on more professional development workshops and co-hosting social events, the new board aims to increase the flow of communication and allow our committees to expand their reach beyond members of just their sole committee.

Alongside the initiative for improved communication comes the initiative for improved community development. The chapter welcomed many new members this past year, many of which we have never yet met in person. In the unprecedented time we were still able to be a resource for them to build meaningful relationships with their peers. Our new board aims to continue to be such a resource as we establish initiatives that increase member retention and the sense of community among the chapter. The first approach of this initiative is member outreach by the officer board, in which we reach out to members both old and new. By reaching out to old members, it lets them know that we still think of them as part of the community and are there to support them. By reaching out to new members, we welcome them into a new situation with open arms and allow them to easily integrate into the community. Previous boards have operated with the motto that there is a place for everyone in BMES, and the new board aims to preserve this motto and help anyone find their niche. The previous initiatives of inter-committee events have had a twofold purpose of increasing the general sense of community while building connections and friendships through collaboration. Members often confine themselves to only a couple of committees and as a result do not meet many other members. By hosting inter-committee events, it brings together more members who might otherwise never meet each other. Thus, the new board aims to facilitate the establishment of meaningful relationships and build a sense of safe community, regardless of whether events are virtual or in-person.