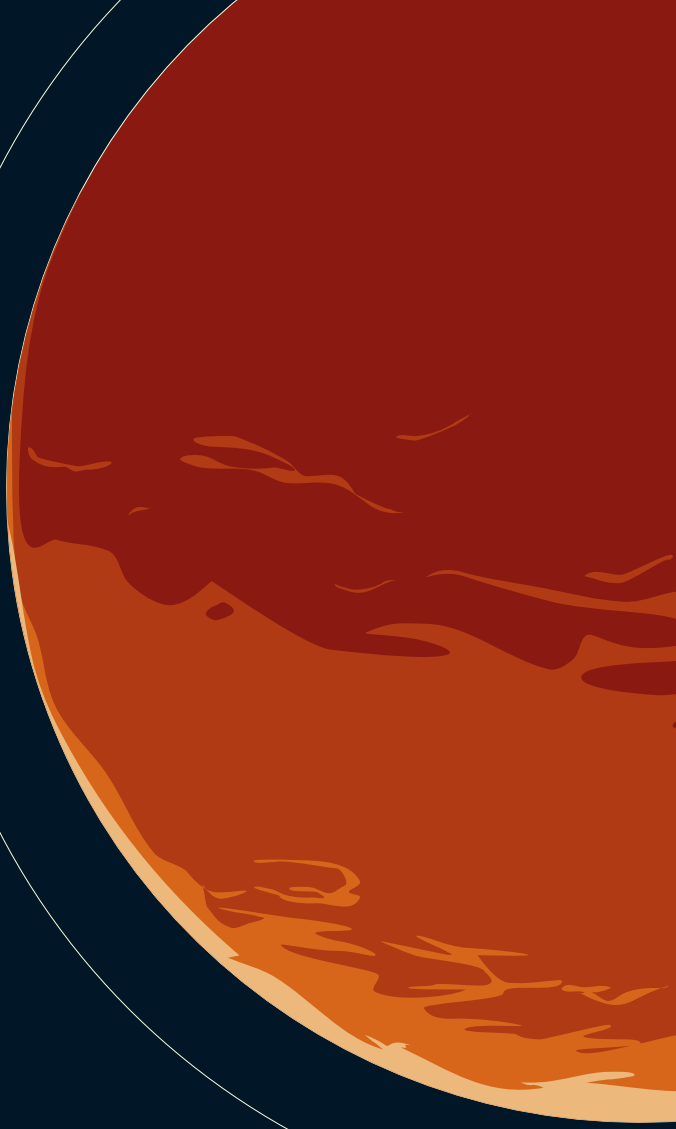
UBC iGEM



UBC iGEM 2025

Sponsorship Package

UBC iGEM

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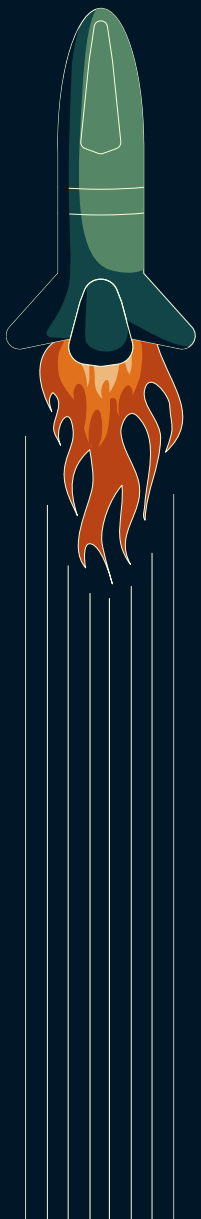


OUR TEAM

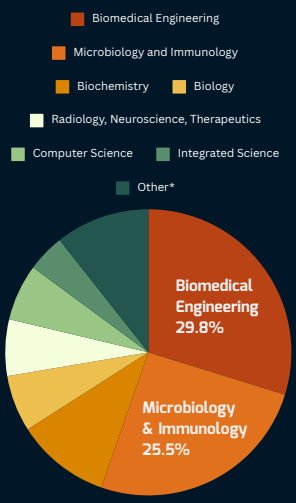
We are UBC iGEM.

As a team of undergraduate students representing UBC, we promote interdisciplinary thinking in synthetic biology. Our team creates a platform for students at all educational levels to explore their passion for synthetic biology through competition research, educational outreach, and science communication.

Our team of over 40 motivated individuals collaborates to design innovative synthetic biology solutions. Under the guidance of professors and graduate student mentors, we conduct meaningful research that not only meets competition requirements but also addresses pressing local and global challenges. Your support will help us expand synthetic biology learning opportunities across British Columbia and secure the resources needed for success at the iGEM Grand Jamboree.

We respectfully acknowledge that our team is based at the UBC Point Grey (Vancouver) campus, which sits on the traditional, ancestral, unceded territory of the xʷməθkʷəy̓əm (Musqueam) First Nation.

2025 Team Member Program Demographics



*International Economics, Chemistry, Earth, Ocean and Atmospheric Sciences, Chemical and Biological Engineering, Pharmaceutical Science

Image: The 2024 UBC iGEM team celebrating team achievements

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THE IGEM COMPETITION

The International Genetically Engineered Machine (iGEM) competition is an annual worldwide synthetic biology, where student teams design, build, and test innovative biological systems. Teams use standardized, interchangeable biological parts and molecular biology techniques to tackle real-world problems. This work brings together students from biology, engineering, computer science, and other fields. Since 2003, iGEM has expanded to include high school, undergraduate, and graduate students, along with community labs and entrepreneurs—now engaging thousands worldwide.

Teams work for months on their projects before presenting at the Grand Jamboree to a global audience and expert judges. Projects earn awards based on innovation, execution, and impact. Beyond competition, iGEM champions the responsible advancement of synthetic biology, fostering an open and collaborative scientific community.

Images: 2024 iGEM Grand Jamboree at Paris, France.

UBC iGEM

Our Project Story

Project CyanoBricks aims to accelerate human settlement on Mars by engineering cyanobacteria to produce building materials on-site, solving the costly challenge of transporting resources from Earth.

Cyanobacteria are ideal for this purpose because they can use Martian CO_2 and sunlight for photosynthesis, promoting self replication and O_2 production. This approach enables scalable, self-sustaining Martian habitats by harnessing cyanobacterial genetic adaptability and tolerance to extreme environments.

The project's impact extends beyond space exploration—on Earth, cyanobacteria-based biomaterials could provide sustainable solutions for construction, environmental remediation, and bioenergy. Building on synthetic biology advances, CyanoBricks strives to enable extraterrestrial settlement while tackling pressing environmental challenges on our home planet.

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WHY SPONSOR US?

Our award-winning team achieved a Gold Medal and won two special prizes (Best Hardware and Best Sustainable Development Impact) at the 2024 iGEM Grand Jamboree held in Paris, France. Additionally, we placed in the Top 5 for the iGEM Village competition in Biomanufacturing, cementing our status as the best-performing undergraduate team in North America.

Building on our history, we invite you to become part of our success story. By joining us as a sponsor, you will contribute to a team that not only achieves competitive excellence but also creates meaningful impact through synthetic biology research and educational outreach. By partnering with us, you will play a key role in shaping the future of synthetic biology while supporting the next generation of scientific innovators. This collaboration offers a unique opportunity to connect with emerging talent, gain visibility in a growing global scientific community, and contribute to groundbreaking research. Together, we can push the boundaries of what's possible.

Past Sponsors:

KOONKIE

Image: 2024 team members Sebastian Hyland, Chaehyeon Lee, and Narjis Alhusseini accepting awards on behalf of UBC iGEM at the iGEM Grand Jamboree, Paris, France.

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WET LAB

CyanoBricks harnesses the untapped potential of cyanobacteria as a chassis organism, a first in UBC iGEM's history. Our wet lab team focuses on engineering this microorganism to create a living machine that can aid in producing construction material on Mars by achieving several key aims:

Overexpression of Urease

As selected cyanobacteria possess urease, the wet lab team seeks to develop these into a part collection toolkit for biochemical degradation of urea. While previous teams have succeeded in this using E. coli, our team aims to provide a basis for cyanobacteria in synbio by creating a cyanobacteria-compatible ureABC operon.

Overexpression of Carbonic Anhydrase

To support biocement production on Mars, we also aim to express carbonic anhydrase on the surface of our chassis. By adapting surface display, carbonic anhydrase can be directly exposed to CO_2, optimizing carbonate ion production to precipitated with dissolved calcium in Martian regolith for biomineralization.

Alginate Production Pipeline

As a supplementary goal, our team would like to explore whether we can engineer an alginate production pipeline in cyanobacteria, as novel alginate-producing strains have been found in the Nile River. We hope this can be an additional gene in our part collection to contribute to the hydrogel required for the biocement for future implementation.

By demonstrating the efficacy of engineered cyanobacteria to produce BioBricks resilient to Martian conditions, we hope to contribute to a future of sustainable travel & food supply on Mars and open up human expansion into previously inhabitable planets.

Image: Wet Lab Lead Pattarin Blanchard experimenting in the Hallam Lab, Life Science Centre.

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DRY LAB

The following projects will be running in parallel with the experiments carried out by our wet lab team to ensure we can iterate through multiple design cycles to improve performance.

Autonomous Fed-batch Bioreactor

To maximize carbonate production in engineered cyanobacteria, the dry lab team is developing an autonomous fed-batch bioreactor. Using liquid digestate as a urea source, the system enables urease activity to convert it into ammonium and bicarbonate, supporting microbial growth. Drawing inspiration from NASA's rotating-vessel designs, the team plans to incorporate low-turbulence cell suspension to simulate performance in microgravity, creating a system adaptable for both space and Earth applications.

3D Bioprinted Martian BioBricks

As part of our efforts to advance sustainable construction in extraterrestrial environments, our team will develop a 3D bioprinter to produce Martian biobricks. These biobricks can be remotely printed to build structures on Mars, with the added safety of ensuring no living bacteria are released into the environment. This innovative project positions us as strong contenders for the Best Hardware prize and allows us to pave the way for scalable, sustainable construction on Mars.

Customized Bioink

The team is developing a sustainable bioink for 3D printing biobricks on Mars, using alginate hydrogel and methylcellulose for improved viscosity and stability. This bioink, containing live cyanobacteria, carbonate-rich nutrients, and Martian-simulated sand, solidifies into strong structures through calcium carbonate formation, enabling construction with local resources.

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Human Practices

Human Practices in iGEM examines the ethical, social, environmental, and cultural dimensions of our project and synthetic biology at large, ensuring that our scientific advancements are socially responsible, applicable and beneficial to a broader public.

Education and Inclusivity

We aim to make our research accessible to diverse audiences, focusing on individuals with disabilities, youth, and Indigenous communities. We plan to collaborate with Geering Up x InSTEM (Indigenous Youth) on summer camps and hands-on activities focused on cyanobacteria and space-related topics, as well as with the CSA-iGEM Internship Program. To reach a broader audience, we would also like to explain our science through interactive online learning material. Additionally, we also plan to create an inclusive lab environment for individuals with disabilities.

Sustainability

We have previously explored green chemistry and engineering to help make our past work sustainable. We will continue to pursue this whilst targeting other goals. Our project aligns with the UN's Sustainable Development Goals (SDGs) 9, 13, and 15, and we will aim to achieve these goals.

Image: Human Practices members Jessica Xin and Charlotte Lee facilitating a GMO workshop during Science 101 (science program for adults)

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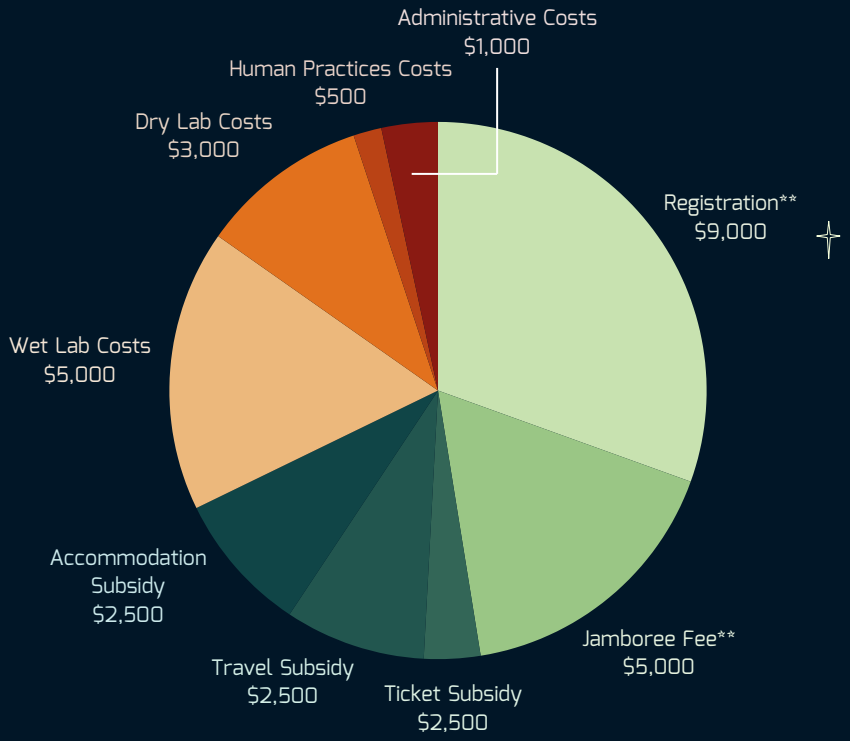
OUR BUDGET



Total Cost: $30,500*

***All prices are listed in CAD**

**The Registration fee refers to the Competition Program Fee to register for the iGEM Competition. The Team Grand Jamboree fee secures the team's Judging Session at the Grand Jamboree, required for medal and prize eligibility.

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Sponsorship Tiers

	Bronze	Silver	Gold	Platinum
	$1000	$2000	$4000	$8000
Logo on Conference Presentation and Poster	✦	✦	✦	✦
Logo on Project & Team Websites	✦	✦	✦	✦
Logo on Promotional Events & Material	✦	✦	✦	✦
Logo on Conference Team Banner		✦	✦	✦
Logo on Team Apparel		✦	✦	✦
Mentions on Social Media Posts			✦	✦
Verbal Recognition in Team Presentation				✦

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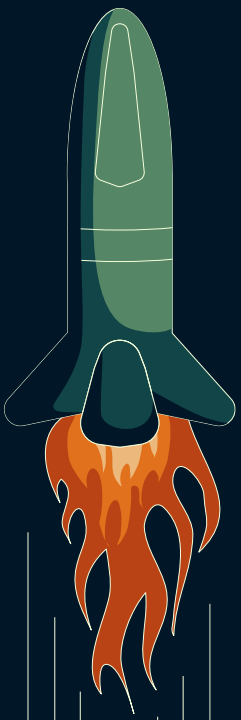

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