



cornel iGEM

2017 SPONSORSHIP PACKET

cornell **iGEM**

Synthetic Biology Project Team

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1 Team Letter

By Greg Albano, 2017 Team Lead



Thank you for your interest in sponsoring the 2017 Cornell International Genetically Engineered Machines (iGEM) Team. Cornell iGEM is an international award-winning synthetic biology inspired team composed of 36 students drawn from various disciplines and levels of expertise across the university. Each year, our mission is to design and construct a novel solution incorporating genetically modified organisms in everyday systems to compete at the world's premier synthetic biology competition in Boston

The iGEM competition brings together high school, collegiate, and entrepreneurial teams, each of which plans and implements novel genetic circuits to help solve the many needs of our industry, economy, or environment. However, without our generous sponsors, we wouldn't be able to continue spearheading synthetic biology research and contribute to the scientific community that is eager for new applications of biological systems.

Thanks to the support of our wonderful sponsors, we have done very well at competition, receiving the Gold Medal at competition for 5 consecutive years. Recently, we reached new levels of success, taking home Best Undergrad Environmental Project along with Best Applied Design and Best Supporting Entrepreneurship. From being published in various publications including Popular Science and Elsevier to having a strong presence in the local Ithaca community through science education outreach programs, Cornell iGEM strives to embody a team that gives back and reaches higher each year.

By supporting us, sponsors have access to an ever-increasing audience of teams, researchers, and industries both in and around the scientific community. Last year, over 300 teams participated in the iGEM competition in October, and each year this competition only expands to include more teams and organizations. Our team's sponsors are featured prominently on our project presentations, competition posters, team apparel, and website. Our website offers a comprehensive overview of our past projects and can be found online at <http://igem.engineering.cornell.edu>. In addition, the following packet contains an extensive breakdown of our team, budget, and past accomplishments for the Cornell iGEM team.

Thank you again for your generous sponsorship!

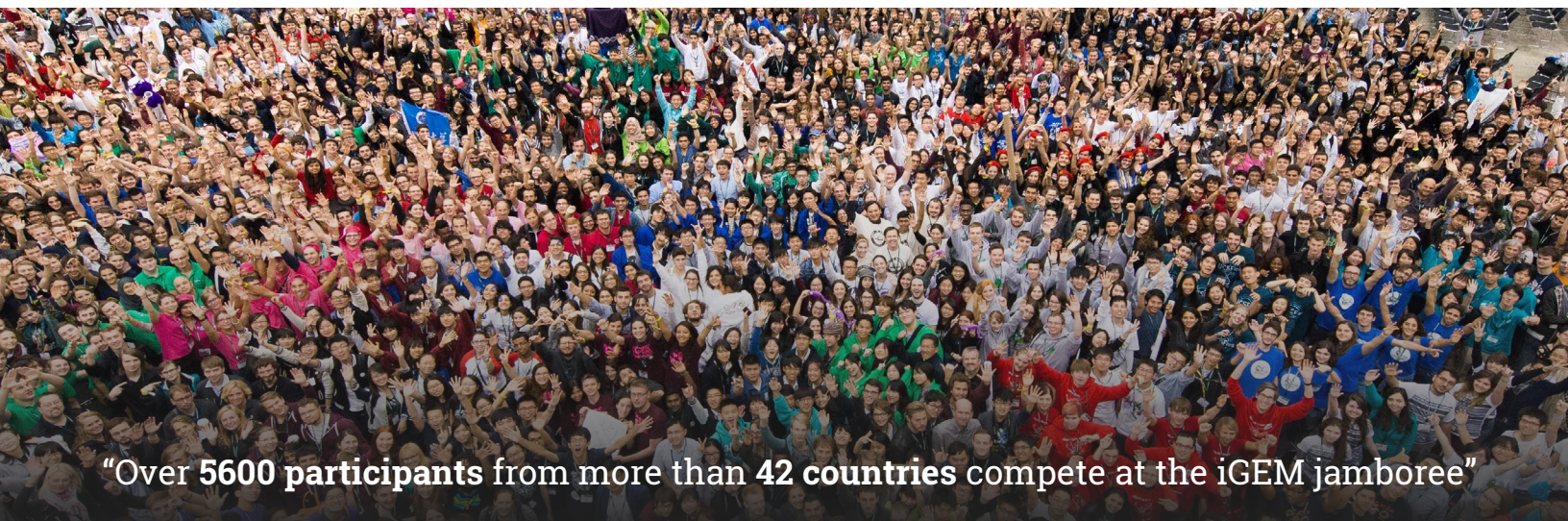
Sincerely,

A stylized, handwritten signature in black ink, appearing to read 'Greg Albano'.

2 What is iGEM?

The Competition

iGEM began in 2003 at Massachusetts Institute of Technology, and has since grown into the world's largest synthetic biology competition, now hosting over 300 teams from around the world in 2016. At the beginning of the season, each team receives a kit plate of synthetic DNA parts from the iGEM headquarters. Using these and parts of their own design, teams integrate synthetic DNA components to create novel, engineered organisms to solve various engineering problems. Teams participate each year at the international competition and are judged based on the quality of their biological work, the significance and applicability of their project, human practices and safety components, and the presentation of the work via their website, poster, and a formal oral presentation.



"Over 5600 participants from more than 42 countries compete at the iGEM jamboree"

The Parts Registry

One of the iGEM competition's greatest goals is the development and cultivation of the Standard Registry of Biological Parts. This parts registry contains thousands of synthetic DNA components designed to be modular: every part in the registry can be interchanged within common DNA backbones, allowing researchers to easily create novel genetic circuits for important engineering purposes. After every competition season, iGEM teams submit their genetic parts (called "BioBricks") to the parts registry for future teams and researchers to use. This collaboration is essential to the iGEM competition and research in synthetic biology in general, and it ensures that any research done by our team can be utilized by the scientific community as a whole.

Our Team

An team with 36 students from four colleges

Cornell iGEM is an undergraduate synthetic biology team and has solidified itself as a perennial contender at iGEM competitions. The team, founded in 2009, is still relatively new, but recent successes have helped the team gain prominence at both the university and the iGEM competition. Our team is composed of 36 undergraduate students from four colleges across the university (Engineering, Arts & Sciences, Agriculture & Life Sciences, and Human Ecology). This diverse group of students uses their different expertise to complete a complex and novel project each year. Cornell iGEM provides dedicated students who have an biological research and engineering an opportunity to gain experience in a professional work environment, hone their practical engineering skills, and pursue their own research goals. As evidenced by our recent human practices accomplishments, our team prides ourselves on sharing our research and promoting safety with regards to the controversial field of synthetic biology. In doing so, we are developing the next generation of responsible scientists with the potential to bring synthetic biology to the forefront of modern engineering solutions.



Our team is composed of 36 undergraduates from four colleges across Cornell

4 Our Achievements

2012

SAFE BET

This year we invented a real-time biosensor for arsenic detection and designed a deployable system. Regionally, we were awarded **top 4 finalist, Best Human Practices Advance** and **Best Wiki**. Worldwide, we won **“Best Solution to an Oil Sands Problem”** from the Oil Sands Initiative and a **top 16 finalist position**.

2014

Lead it Go

Building off our SAFE BET platform, in 2014 we manufactured a continuous water filtration system to sequester heavy metals. We achieved **Gold Medal** classification for the fourth consecutive year at the international competition.

2016

Legendairy

During the most recent competition, we created a novel bacteriocin treatment for bovine mastitis as well as a customizable milking shell and detection app. We were awarded **Silver Medal** classification and nominated for **Best Human Practices**.

2009-2011

First Projects

The Cornell iGEM team is formed and competes for the first time, creating projects on a cadmium biosensor in 2009 and outer membrane vesicles in 2010. In 2011, we won **“Best Manufacturing Project”** for our Biofactory project, a cell free method of synthesizing complex biomolecules.

2013

Organofoam

In 2013, we designed a comprehensive toolkit of genetic parts to facilitate fungal engineering. At both the North American and international competitions, we won the **Best Human Practices Advance** awards as well as **Gold Medal** classification.

2015

fishPHARM

This year, we constructed a novel drug delivery system and probiotic treatment for Bacterial Cold Water Disease and an app for monitoring nutrient content in fish hatcheries. Internationally, we won the **Best Supporting Entrepreneurship, Best Environmental Project**, and **Best Applied Design** awards, and addition to earning **Gold Medal** classification for the fifth straight year.

Redox Biosensor

Our 2017 Project

Project Summary

The basis of our project this year is to further explore the transmission of data to and from engineered biological systems. We want to accomplish this by transmitting and receiving data in the form of light. As synthetic biology grows as a field, the value of techniques that involve the manipulation and control of systems continues to increase. We hope to achieve this end.

We will use roGFP, a redox sensitive fluorescent protein, to detect the degree of oxidative stress in solution, and transmit that information, in the form of light at a specific wavelength, to a ratio-metric receiver that our Product Development subteam will design. Upon interpretation of this data, expression of Catalase, which regulates RO species, can be activated using an optogenetic promoter system.

There are a variety of different real world applications for this, ranging from regulation of stress in industrial bioreactors to degradation of hydrogen peroxide species in waste water. We are still exploring our options regarding this.

Our main goal is to further the field of synthetic biology. The idea of optogenetic promoters has been well documented in literature; however, use of fluorescence as a form of information output is relatively novel. The project on a whole is very ambitious, but it is our hope that we are able to continue Cornell iGEM's tradition of success at competition and further.

Policy & Practices

Policy and Practices is broadly defined as the incorporation of any economic, ethical, legal, or social dimensions into an iGEM project. The team continues to create Policy and Practices components that contribute to and complement the work our team is doing, as well as foster a meaningful impact on our local and global communities.

To this end, we complete the following: (1) engage in extensive outreach, (2) learn about the environmental, social, economic, and political issues that shaped the world of the biochemistry we are tackling, (3) develop a social media platform called Humans and SynBio in collaboration with teams from across the world, (4) put together surveys to understand the factors underlying opinions about synthetic biology, (5) facilitate collaborations within our university and with outside agencies to put together a portfolio of possible applications of our genetically engineered technologies, and (6) consider the bioethical and safety implications of our work at large.

2016 Project Budget

Project Expenses

Expense	Cost
OligoPrimer and gene synthesis	\$2,000
DNA Sequencing	\$750
Molecular biology chemicals and reagents	\$3,500
Plasticwear and other lab supplies	\$3,000
Product Development and Electrical Supplies	\$2,500
Software Licensing	\$2,000
Outreach supplies	\$50
Training Fee, Printing	\$400
Total	\$14,200

Competition Expenses

Expense	Cost
Team Registration Fee	\$4,500
Individual Registration Fee \$695/person X 5 people	\$3,475
Individual Registration Fee \$695/person X 5 people	\$2,500
Travel Expenses	\$1,500
Lodging 4 rooms x 4 nights	\$4,000
Total	\$15,975

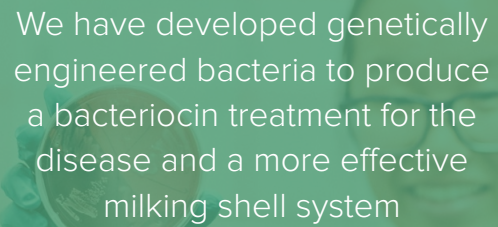
Overall Total - \$30,175




Our 2016 project in review




We have created a comprehensive solution to Bovine Mastitis to increase the productivity and health of dairy farms




We have developed genetically engineered bacteria to produce a bacteriocin treatment for the disease and a more effective milking shell system



We have received silver medal status at the international competition and nominated for best integrated practices



We have made a significant impact on our local community through participation in the YOURS mentorship program and local events to promote public awareness

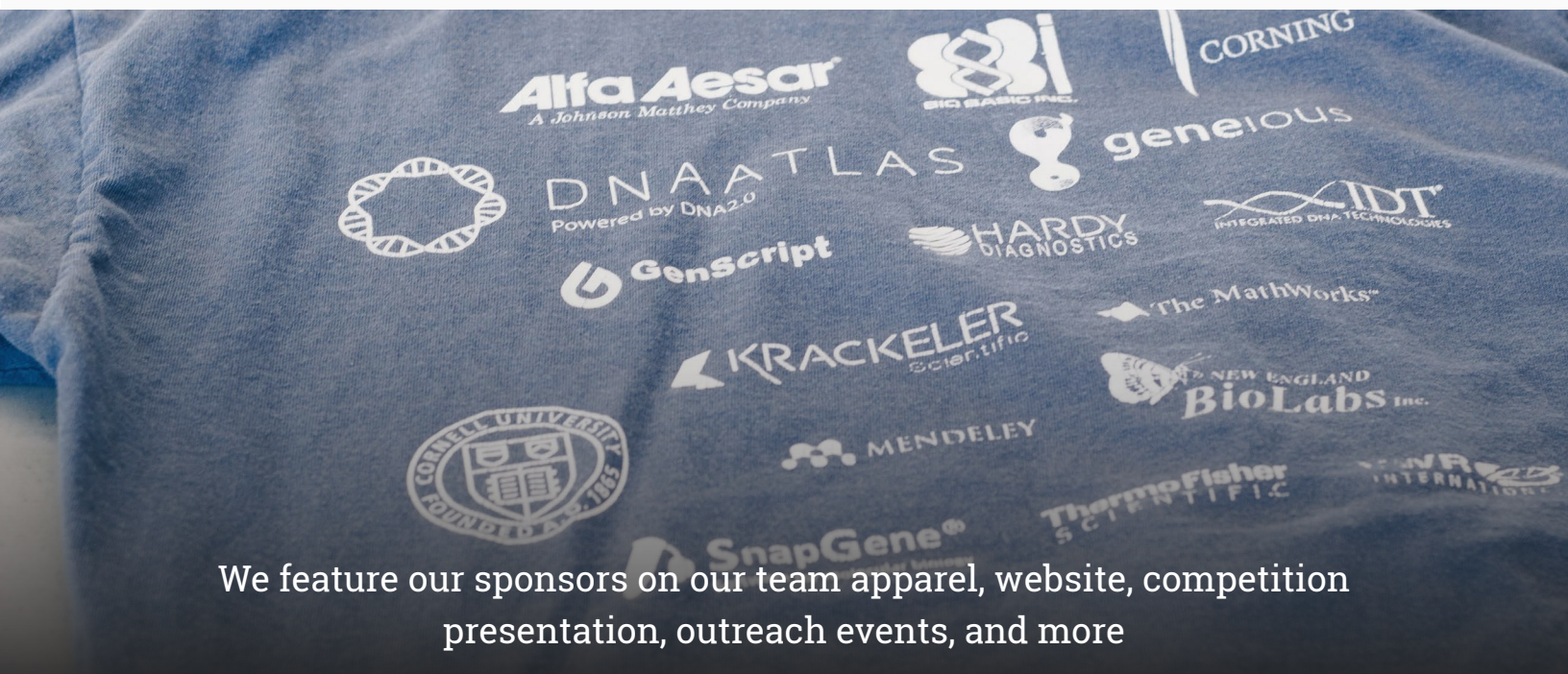


We have also developed prevention and detection tools for farmers - a modular milking shell to reduce disease risk and an iPhone app for tracking

8 Sponsorship Benefits

Competition Visibility

Sponsors get high visibility through both the presentation in the iGEM competition and the networking through the university. Each year, Cornell iGEM competes at the largest international synthetic biology competition (over 280 teams in attendance with over 2300 participants). All of our sponsors are featured prominently on our competition poster, competition presentation, and project Wiki. Even after the competition, our team website and Wiki from this past competition season (on which all of our sponsors are featured) both receive around 500 hits per month, and still continue to be visible. Due to our success the past couple seasons, our team has been featured in various publications including Elsevier, the Cornell Chronicle, the Cornell Daily Sun, IDT's Decoded, and Popular Science, as well as newsletters from our past and current sponsors



We feature our sponsors on our team apparel, website, competition presentation, outreach events, and more

University Networking

Cornell University is a highly respected and well-regarded research university. At the university, sponsors can gain publicity through interactions between the team with other students and research labs. As a relatively new team, we have a very young and active alumni network with which we share the names of our sponsors. Each year we have graduating members who are eager to pursue careers in biology and engineering — quite possibly with a sponsor.

Your Sponsorship



Gifts in Kind

- Centrifuge tubes (2 mL, 15 mL, 50 mL) and micropipette tips
- PCR reagents (DNA polymerase, dNTPs, etc.)
- Cloning enzymes (EcoRI, SpeI, PstI, XbaI, NotI, DNA Ligase)
- Antibiotics (Chloramphenicol, Kanamycin, Ampicillin)
- Gel electrophoresis materials (Agarose, TAE Buffer, DNA Ladder, Ethidium Bromide)
- Molecular biology kits (Plasmid miniprep, DNA clean and concentration)
- Electroporation cuvettes
- Media components (LB Broth, Yeast Extract, Tryptone, various salts)
- Software licenses
- Electrical & mechanical engineering tools

Monetary Support

Our team also accepts any monetary support. There are many items we need that we cannot receive in kind, so monetary support is vital to the success of our team. In addition to purchasing those items listed above, contributions will be put towards custom primers, DNA sequencing, iGEM registration fees, travel and lodging for competition, and savings funds for future Cornell iGEM teams.

Intellectual Partnership

In addition to receiving donations from sponsors, we have also formed partnerships with businesses in the past. In 2013, Cornell iGEM made great strides in bridging the gap between the iGEM competition and industry. Our collaboration with Ecovative, a leading biomaterials company, proved to be the most meaningful and in-depth partnership between an iGEM team and a corporation to date. Such partnerships depend greatly upon our project each year, and as a team we are open to working with businesses to solve problems with synthetic biology.

10 Donation Form

Supporting Our Efforts

Cornell iGEM provides promising undergraduate scientists and engineers the opportunity to pursue their own research interests in a supportive team environment. While Cornell does provide our team with laboratory space, access to some of its outstanding facilities, and funding for competition fees and travel, funding for individual components of our project must come from generous, outside sponsors.

If you are interested in supporting our efforts this year and becoming a part of an exciting and successful synthetic biology team, please fill out the following form and return it to the provided address. Checks can be made payable to "Cornell iGEM" and attached to this form. If you have any questions about our team or specific support we could use, please don't hesitate to contact us. We greatly appreciate support of any kind. Thank you for your time!

Mailing Address

Cornell iGEM
Attn: Greg Albano
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Ithaca, NY 14853

Contact Information

Team Leader: Greg Albano
Phone: 213 - 880 - 7781
Email: cornelligem@gmail.com
Website: igem.engineering.cornell.edu

General Information

Name of Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Contact Information

Contact Name: _____ Contact Title: _____

Phone Number: _____ Email Address: _____

Donation Information

Gift in Kind

What is the gift in kind? _____

What is the market value of the gift in kind? _____

Monetary Donation

What is the donation amount? _____

Donor Signature: _____ Date: _____

Thank you to our 2016 sponsors

