

INTRODUCTION

International Genetically Engineered Machine (iGEM) is the premier student synthetic biology competition started at the Massachusetts Institute of Technology (MIT) and initially aimed at undergraduates but has since expanded to include high schoolers and entrepreneurs. The vision of the competition is to create a catalog of standardized parts in what is called the Registry of Standard Biological Parts. This would enable biologists to connect BioBricks (pieces of DNA) in the same way you would snap together Legos. The goal at the high school level is to engage in and promote the study of synthetic biology. Ultimately, the hope is to create biological tools to solve our most pressing problems.

iGEM is not only changing the way biology is taught, but also helping to change the way in which it is understood. Through this competition, Marksmen can apply knowledge learned in the classroom to solve some of the world's pressing problems in labs on and off campus.

St. Mark's provides an ideal environment for the exploration of synthetic biology. Few secondary schools can match St. Mark's quality of instructors, resources, and inquisitive ethos. In line with the school's mission, iGEM encourages intellectual curiosity through scientific inquiry. The competition also provides Marksmen with an outlet to conduct original research at the high school level.

Since synthetic biology fuses Science, Technology, Engineering, and Math, St. Mark's iGEM also aims to promote an interdisciplinary approach to solving problems at St. Mark's. By combining the talents and interests of team members, we can research and innovate with an open mind to new possibilities. Pursuing research in biotechnology sets St. Mark's at the forefront of secondary science education. If we are granted sufficient funding, we would be the only high school team from Texas competing against approximately thirty teams from around the world. Moreover, the collaboration, curiosity, and consideration of ethics necessary for iGEM present Marksmen with real world problems and opportunities for growth both intellectually and personally.

PURPOSE

THE TEAM

The iGEM Team is a subset of the Biology Club led by Halbert Bai.	
Sponsors	Mark Adame & Douglas Rummel
Captains	Halbert Bai & Aarohan Burma
Vice-Captains	Jeffrey Wu & Tim O'Meara
Wiki Director	Vikrant Reddy
Outreach Coordinator	Nikhil Jain
Members	Raymond Guo, Gopal Raman, Akshay Malhothra, Rohan Pinto
Advisors & Consultants	Sandeep Burma Ph.D., Moez Aziz '11, Milan Savani '13, Reid Weisberg '12

SYNTHETIC BIOLOGY

Synthetic biology approaches the study of life in a modular way. Parts are constructed through direct evolution, which involves large numbers of mutant DNA are created and then incorporated into cells. Cells are then selected to have a particular function. After multiple iterations, it is possible to generate functional and useful biological parts. Known as BioBricks, these parts can be used to build organisms. The possibilities are endless with synthetic biology.

OUTREACH

Through this initiative in the Biology Club, we also aim to foster relationships with local research universities, programs, and laboratories that will open more opportunities for Marksmen. In fact, through our work, we have also gained access to a radiation oncology lab at the University of Texas Southwestern Medical Center. Our work has also prompted us to seek help from alumni and experts. We now have a team of advisors who have agreed to help us.

THE PROJECT

Thanks to advertisements and popular media, the popularity of probiotics is at an all-time high. Defined as microorganisms that confer health benefits when consumed, probiotics are added to dairy products and distributed as individual capsules. When consumed in regulated amounts, probiotics can perform a range of medical functions, from restoring the balance of beneficial bacteria in the gut after antibiotic treatment to assisting in recovery from urinary tract infections. Although the efficiency and efficacy of probiotics has been hotly debated, there is no question that probiotics are the future of consumer medical supplementation.

The Biology Club of St. Mark's School of Texas would like to explore exciting new developments in probiotic culturing. We plan to conduct research in order to pinpoint an enzyme that is deficient in certain populations and could lead to medical conditions such as obesity. Through the iGEM program, we will genetically engineer bacteria or yeast in order to efficiently produce large quantities of this enzyme, which can then be extracted and supplemented to the deficient groups. The ultimate goal would be to create a safe, cost-effective probiotic, that, when consumed, would take up residence in the human body, produce the deficient enzyme, and hopefully curb the need for other medical treatments.

SUPPORT US

The St. Mark's iGEM Team would greatly appreciate individual contributions and corporate sponsorships. Your donation will directly fund our research. If you would like to make this monetary support in connection with your company, we will increase the visibility of your organization by placing your logo on our team's social media page, online wiki, and on the back of T-shirts we wear to competitions. Large corporate partners will also be allowed to make suggestions in regards to research conducted.

SCHEDULE

November	Registration opens for 2014 iGEM High School
December 31	Regular registration closes
January 15	Late registration
Early January	3A Assembly kit sent to teams
	Transformation efficiency kits sent to teams
Late January/early February	DNA distribution kits sent to teams
March	Team project descriptions due
May	Registration for High School Jamboree opens
	Track selection due
	Project abstracts due
	Team rosters due
	Jamboree attendance fees due
	Wiki Freeze at 11:59
Early June	Part submissions due
Late June	iGEM High School Jamboree

COST

Regular Registration Fee	\$1500.00
Jamboree Attendance Fee	\$540.00
Transportation	\$1000.00
Research (Kits, Parts, etc.)	>\$500.00
Total (Approximate)	\$3540.00

CONTACT US

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