

What is the iGEM competition about? Synthetic Biology?!

International Genetically Engineered Machines

ORIGINS OF THE iGEM COMPETITION

The competition is derived from Synthetic Biology and was run from classes at MIT (Massachusetts Institute of Technology) in 2003. The competition officially started in 2004 at MIT with 5 teams. By 2009 there were 110 teams (1200 participants) and this year there are 180 registered teams. This includes team Wits-South Africa, the first team to represent our continent!

COMPETITION CRITERIA

The teams are composed of under graduate students who are responsible for:

- designing the project
- undertaking the research
- fund raising

The team needs to construct / characterise at least one aspect of the machine. The competition is focussed on engineering not discovery and so a new device does not need to be made. All data needs to be documented and added to the team WIKI site.

JUDGING

The team gets credit for the parts that they make / improve on by adding them to the registry. Teams present their findings at MIT at a Jamboree in November. This gives the students a chance to see what other teams did but is not critical to judging. Only documentation found on the WIKI is judged so the more comprehensive the better! The WIKI is frozen 1 ½ weeks before the Jamboree so it is important to keep it up to date.

The WIKI

The WIKI is where all information relating to the project, team and sponsors can be found.

This is the teams link to fellow competitors and, most importantly, the judges! This is a screen shot from our home page.



Synthetic biology is a revolutionary, dynamic field resulting from the fusion of engineering and molecular biology that has the potential to impact many facets of society. It is an inter-disciplinary field involving chemists, biologists, engineers, physicists, mathematicians, computer scientists and even philosophers.

This dynamic field can also be defined as the use of artificial molecules to reproduce emergent behaviour from natural biology, with the goal of creating artificial life forms or otherwise to seek interchangeable biological parts with the intention of assembling them into devices or systems that function in a manner not found in nature. Because humans are living, biological entities - the greatest benefits of synthetic biology may result from its application to medicine.



This years project

TOPIC TO ADDRESS LOCAL AND GLOBAL CHALLENGE

Developing an *in vivo* biosensor to detect and neutralise Human Papillomavirus (HPV). It should produce a coloured signal as positive test for virus detected in urine. The multidisciplinary team tackle different aspects of the model design and implementation:

- The molecular biologists, chemists and engineers construct the machine and provide experimental data for characterisation
- The engineers and mathematicians model the performance of individual components and the integrated device
- The social sciences student provides the ethical framework for development and deployment of the device

This years team

The team is made up of undergraduate students, post graduate advisors as well as University and Industry supervisors:

Students

Michelle Robinson
Gregory Meyer
Byron Jacobs
Shaun Burd
Langelihle Ntloko
Liam Wilson

Advisors

Laura Millroy
Robyn Brackin
Youtaro Shibayama

Wits University Supervisors

Dr Karl Rumbold: Molecular and Cell Biology
Dr Robert Kowalenko: Social Sciences
Mr Ezekiel Madigoe: Chemical and Metallurgical Engineering
Dr Marco Weinberg: Pathology
Prof. David Rubin: Electrical and Information Engineering
Prof. David Sherwell: Mathematics

CSIR Biosciences Supervisors

Dr Musa Mhlanga
Dr Raymond Sparrow



Current Sponsors



We are very honoured to have received funds from the following groups:

- Wits Faculty of Health Science
- Inqaba Biotech
- Biped Personal Biotech

How to join next year!

If your curiosity has been spiked and you would like to find out more, feel free to contact:

- Dr Karl Rumbold**
School of Molecular and Cell Biology
Faculty of Science
- Dr Marco Weinberg**
School of Molecular Medicine and Haematology
Faculty of Health Science
- Dr Raymond Sparrow**
CSIR Biosciences



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