

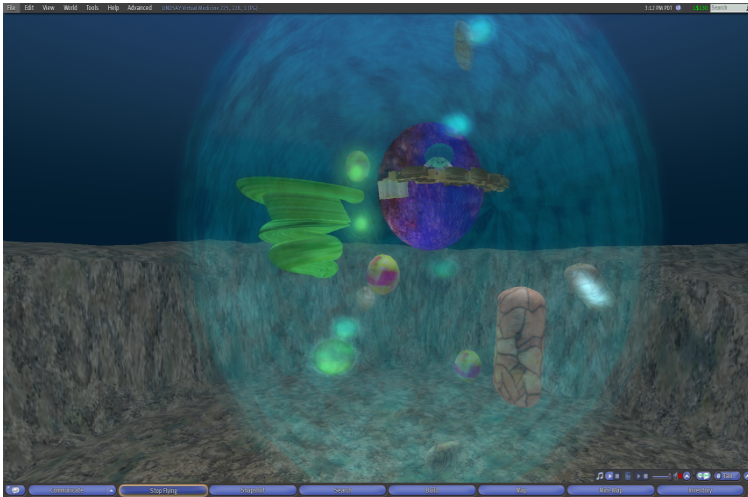
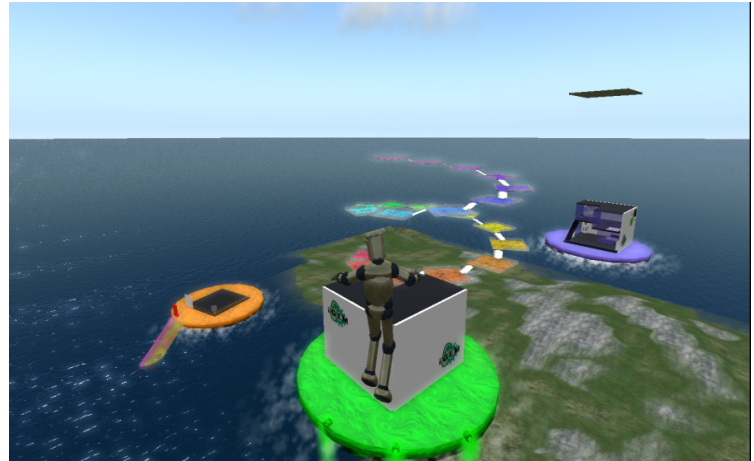


SYNTHETIC BIOLOGY INTERACTIVE

Every year at iGEM, new students begin exploring Synthetic Biology. How do we show these new participants the ropes of Synthetic Biology and facilitate learning?

SYNTHETIC BIOLOGY INTERACTIVE is a virtual learning environment we created in Second Life. The purpose of this learning environment is to:

- Introduce people to the field of Synthetic Biology
- Provide an overview the basics of molecular biology required in the iGEM
- Provide the opportunity to design and test biological circuits
- Simulate common iGEM experimental procedures used in the wetlab



WHAT IS SECOND LIFE?

Second Life is an online virtual world, where users can create their own objects, buildings, and costumes. Through the use of flexible building tools, the possibilities of creation are nearly endless. The diverse interests of this community has allowed for the development of videogames, international conferences, and virtual classrooms, to name a few.

To join, create an account and download the client at <http://www.secondlife.com>!

EDUCATION IN SECOND LIFE

Numerous universities have online campuses that use Second Life as a virtual classroom. While lecture-based teaching methods are commonly used in Second Life, this offers students no more opportunity for inquiry-based learning than traditional education. At iGEM Calgary, we recognize that Second Life has much more to offer! In order to encourage interactive learning in Second Life, our educational activities are self-directed and engaging resulting in learning beyond simply a good retention of information.

EVALUATION OF THE SBI PROJECT

In order to gauge the success of our island, we will open our island to a number of high school/university students. We will determine if the goals of SBI have been met based on the results of a feedback questionnaire given to the students as well as educators. Feedback from the questionnaire will provide us with an idea of whether our educational environment was useful, was easy to use, and whether or not the concepts we chose to include were presented clearly. A quiz may also be administered to see which concepts were most appropriately conveyed to the students.

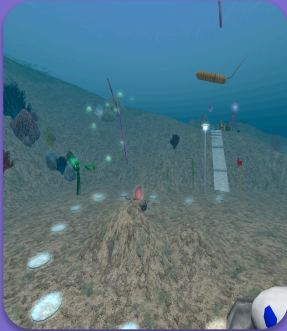
iGEM Calgary 2009 SL Team: Mandy Cheung, Patrick King, Katie Ovens, Stefan Marcus

iGEM Calgary 2009 Facilitators: Thane Kubik, Sonja Georgijevic, Anders Nygren, Christian Jacob

THE SYNTHETIC BIOLOGY INTERACTIVE ISLAND

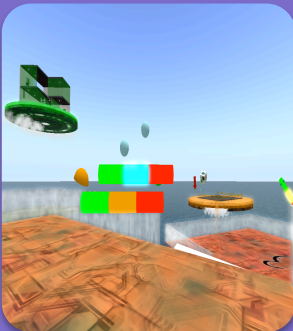
SBI Island is divided into three main components, designed to guide learners sequentially through an introduction to Synthetic Biology, the basics of molecular biology and of the iGEM biobrick, and finally to our virtual wetlab.

Synthetic Kingdom



- Explore the current and potential applications of Synthetic Biology.
- Participate in hands-on activities illustrating these applications, such as oil spill clean up (bioremediation) and quorum sensing.
- Gain an understanding of the possibilities available in the field of Synthetic Biology.
- Become familiar with Second Life controls and actions such as "inventory drop" and attaching objects to your avatar.
- The Synthetic Kingdom is a dynamic, colourful environment that will incite individuals of all backgrounds to explore Synthetic Biology.

Biobrick Simulator



- Learn the basics of molecular biology: the central dogma, DNA replication, transcription, and translation through our interactive tutorials.
- Build genetic circuits online, comprised of coding sequences, promoters, proteins, and other components pulled from the Registry. The results of these circuits are simulated for easy visualization.
- Multiple levels provide an introduction to common iGEM parts and systems as well as the freedom to design your own. These parts are color coded to match those from the registry: green for promoters, red for terminators, etc. The proteins also match their coding sequences, to clearly show the proteins produced from these assembled circuits.

Virtual Labs



- Gain hands-on experience with the lab techniques and procedures used over the course of the iGEM and molecular biology in our virtual labs.
- Students run simulated lab experiments using scripted equipment to assess their understanding of experimental procedures. These procedures include PCR, gel electrophoresis, bacterial transformation, DNA extraction, and restriction digest/ construction.
- Structured lab missions provide students with a challenge as well as the opportunity to see how different lab procedures are combined in the design of experiments to achieve certain goals

For more information, please visit us at <http://2009.igem.org/Team:Calgary>

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