msnbc.com

Bright bacteria wins synthetic biology competition

Glowing E. coli bright enough to verify experimental results with

By Eric Bland

Discovery Channel
updated 1:58 p.m. ET Nov. 6, 2009

Bacteria bright enough to see with the naked eye won the coveted BioBrick at this year's International Genetically Engineered Machine (iGEM) competition.

The annual contest brings together teams of undergraduate students from across the globe and showcases some of the newest and most unique ideas in synthetic biology.

"We saw some incredible projects this year," said iGEM organizer Randy Rettberg. "We are training the next generation of synthetic biologists."

Synthetic biology is a more organized and structured offshoot within the field of genetic engineering. Instead of custom designing every tool and part needed for an experiment — reinventing the wheel each time so to speak — synthetic biology aims to standardize all the parts and tools of genetic engineering.

The goal is to make ordering a gene that produces a particular chemical or confers resistance to a specific drug as easy as ordering a pizza. All of the parts created by the teams are housed at the Registry of Standard Biological Parts.

The field has already paved the way for a cheaper, life-saving, anti-malaria drug and inspired basement "biohackers" reminiscent of the early founders of the major computer companies.

Despite the enormous potential of this field, critics also warn of its dangers. They allege that scientists are playing God by trying to create artificial life forms. Furthermore, these critics warn of the possibility of bringing back diseases, such as the 1918 flu or smallpox.

The organizers of iGEM have long worked with government agencies to prevent such threats, and Rettberg takes pains to refute these claims.

"We have been working hard on safety since the very beginning," said Rettberg, noting that the Federal Bureau of Investigation was one of the sponsors for this year's competition.

iGEM began in 2003 when Drew Endy (now at Stanford University), Tom Knight and several MIT students spent the month of January trying to design standardized biological parts to create bacteria that blink on and off like a light switch.

Since that first classroom project, iGEM has grown to include more than 100 teams from a dozen countries.

After a summer spent working on their projects, the various teams converge on Cambridge, Mass., for the

msnbc.com

annual iGEM Jamboree in the fall, where they will present their ideas to a panel of judges in hopes of winning the prestigious BioBrick, a giant, silver-colored Lego block.

The University of Cambridge team designed multicolored, glowing E. coli bright enough to see with the human eye to verify experimental results.

Students from the University of Groningen created bacteria that can remove arsenic from drinking water.

Team Heidelberg created a series of biobricks for mammal cells and several "spybricks," which are used to monitor specific molecular pathways inside cells.

The students from Imperial College London created the "E.ncapsulator," a sugary coat for E. coli bacteria t hat protect them from a normally lethal acid bath.

The team from the University of Valencia created a truly organic television screen by using bacteria as pixels. Primitive and limited to only a few pixelated images of a person doing jumping jacks (helpfully demonstrated on stage by the students), the research takes synthetic biology in a new direction.

After the judges retired and the teams posed for a group picture, the final results were announced. Valencia came in third, Heidelberg came in second and the University of Cambridge took home the top prize.

Past iGEM teams have published their results in peer reviewed academic journals, although no papers from this year's Jamboree have yet been accepted.

Still, the results are encouraging to Peter Carr, a synthetic biologist from MIT and a judge at this year's Jamboree. "I learned things that I wasn't able to do a few years ago," said Carr. "Now I might have to go back and reconsider a few projects."

URL: http://www.msnbc.msn.com/id/33728433/