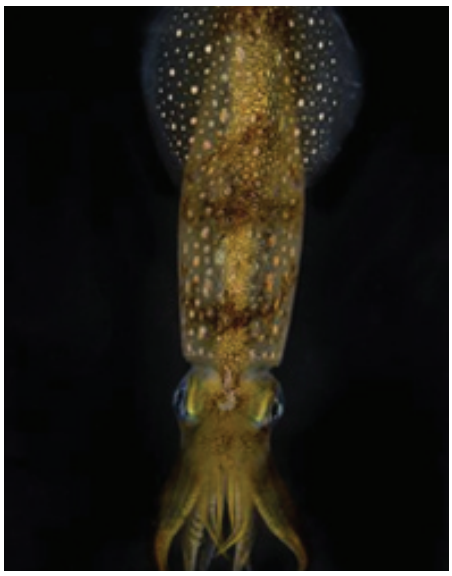
Team Cambridge 2011

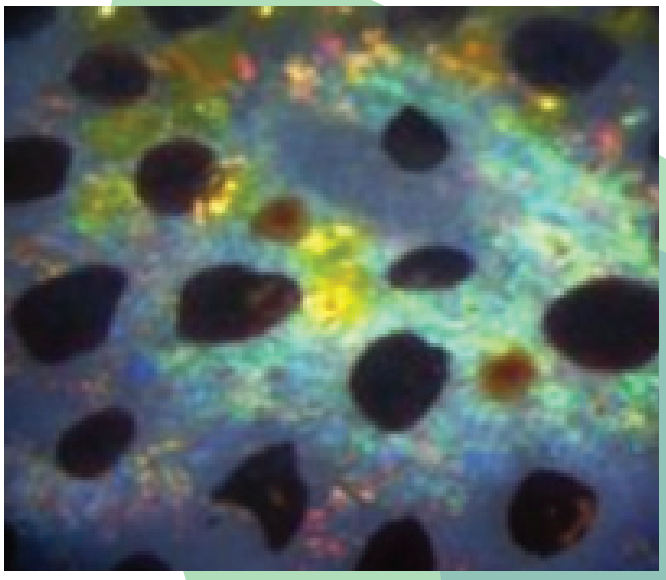
UNIVERSITY OF CAMBRIDGE

iGEM is a cutting edge synthetic biology competition pushing the frontiers of science year on year. Teams are sent a standard tool kit of biological parts, or Biobricks, and are challenged to design, characterise and implement original parts. Novel applications of the parts made will be identified and their implications for researchers, industries and consumers explored.

- Last year's team - E.Glowli - with their bioluminescent bacteria.

Previous Cambridge teams have constructed systems to dramatically improve existing biosensors by introducing an easy-to-read output in the form of colour. The following year, the expression of light producing proteins from fireflies and bioluminescent bacteria in bacterial systems were optimised, increasing the intensity and duration of light output.





We have been inspired by cutting edge research into the dynamic iridescence exhibited by the squid Loligo pealeii and its relatives. Researchers have been able to express the protein responsible, reflectin, in bacteria and make thin films in vitro which display this proteins' unique properties. These properties include the highest refractive index of any known protein and self assembly into protein nanospheres.

The most exciting feature of reflectin is its ability to shift the peak wavelength that it reflects in various conditions. In vivo, tests demonstrate that altering the tension in the tissue causes iridophores, the reflectin containing cells in squid skin, causes rapid colour changes. In vitro, the spectral shift can be observed in response to the exposure of thin films of reflectin to water vapours and gaseous ethanol and methanol. Perhaps even more interesting to us is the possibility of being able to control the spectral properties of this protein via post-translational modification which has been reported in the literature.

This finding opens up the possibility of exploiting this colour changing property for biotechnological means and is one we are investigating. We intend to explore both - the in vitro properties of reflectin and the push the boundaries of what is known about this protein - by expressing it under different regulation in E. Coli. We will also explore the synthetic biology tools at our disposal to make modifications to reflectin in the hope of laying down the foundations of future usage of this remarkable material.

Benefits to Sponsors

Team Cambridge are flexible in what we can offer our sponsors

› Display your company logo on our T-shirts, presentation materials and website

› Information or links to your company on our website which will be available online for years to come and will be viewable by the judges, other teams, researchers and the media

› Your company name mentioned in any press releases made about our work

› Access to a group of academically and creatively talented undergraduates who are gaining a unique work experience and skill set through competing in iGEM

› Regular updates from the team to you

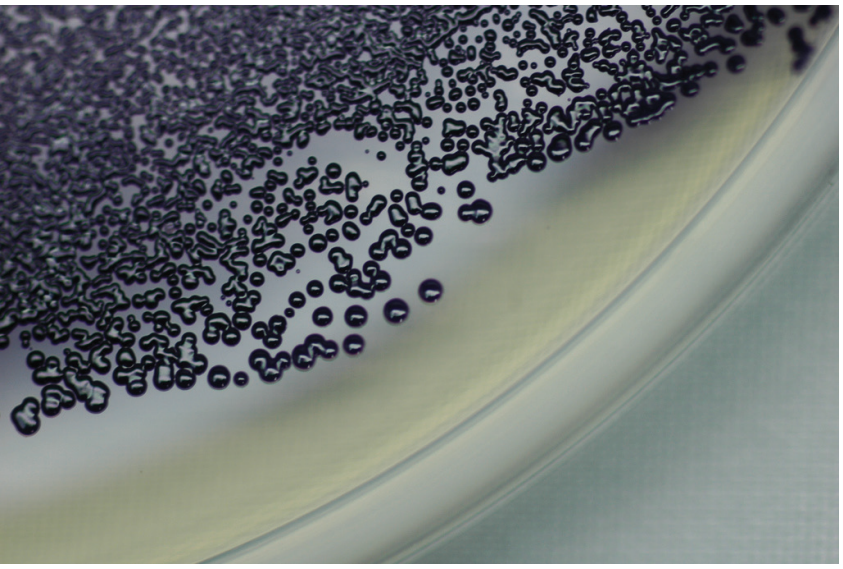
Team Cambridge 2011

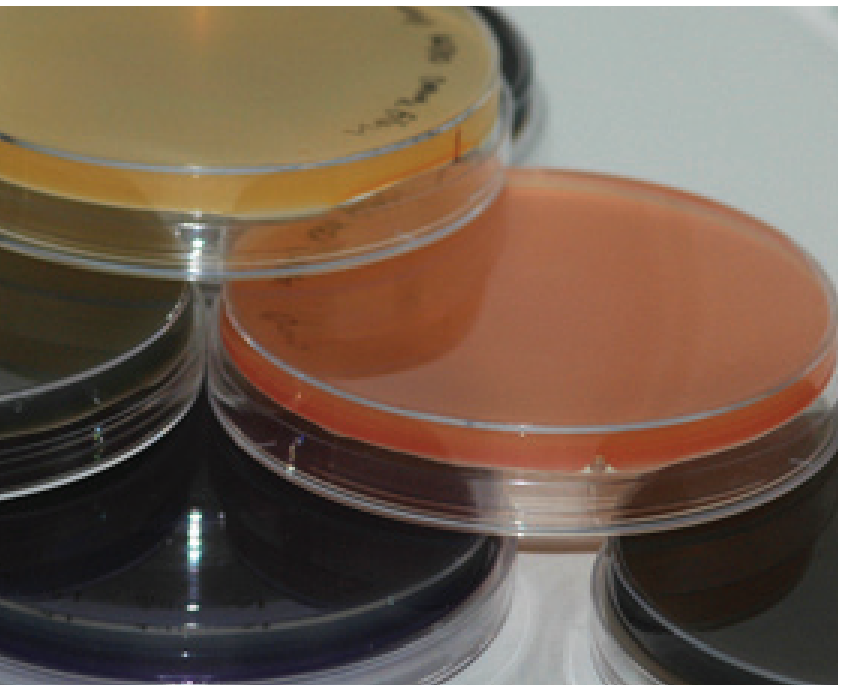
› Name	› Specialism
› Jim Haseloff	Synthetic Biology and Engineering of Plant Systems
› Gos Micklem	Synthetic Biology and Computational Biology
› Jim Ajioka	Synthetic Biology and Senior Lecturer in Pathology
› Haydn King	Second Year Engineering Undergraduate
› Cat McMurran	Second Year Natural Sciences Undergraduate
› Katy Wei	Second Year Natural Sciences Undergraduate
› Felix Zhou	Second Year Engineering Undergraduate
› Heather Gin Xao	Second Year Engineering Undergraduate
› Jonathan Very	Second Year Natural Sciences Undergraduate
› Joe Harvey	Second Year Mathematics Undergraduate
› Marta Bozek	Second Year Natural Sciences Undergraduate
› Matt Jones	Second Year Natural Sciences Undergraduate
› Veronica Ranner	Design Interactions Graduate (Royal College of Art)
› Gerrit Kaiser	Design Interactions Graduate (Royal College of Art)
› Ai Hasegawa	Design Interactions Student (Royal College of Art)

How Sponsors Can Support Us

We are receiving less departmental funding this year and thus we would be greatly helped by any monetary contribution to our budget for consumables, travel expenses and T-shirt printing!

- For a donation of just 100 £ we will publicise your company online, in the press and on our T-shirts
- As part of the competition we are required to explore Human Practices. We plan to host presentations and workshops with members of the general public and our sponsors will be invited to attend. These events will be used to both report on our progress and conduct research into perceptions of synthetic biology. All findings will be made public on our wiki and factored into our designs
- We would also be pleased receive any donations in the form of actual molecular biology apparatus and equipment relevant to our project. These may be supplied as loans, discount, store credit, or free samples





Pictured left is violacein - a purple protein pigment and the active product of one of the many pigment Biobricks produced by the 2009 Cambridge iGEM team.

The project E.chromi produced a rainbow coloured assortment of pigments previously unavailable in E.coli, which along with an original sensitivity tuner won the Grand Prize, ushering in a new paradigm in biosensor design!

Support **Team Cambridge** in the world's most prestigious synthetic biology competition!

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