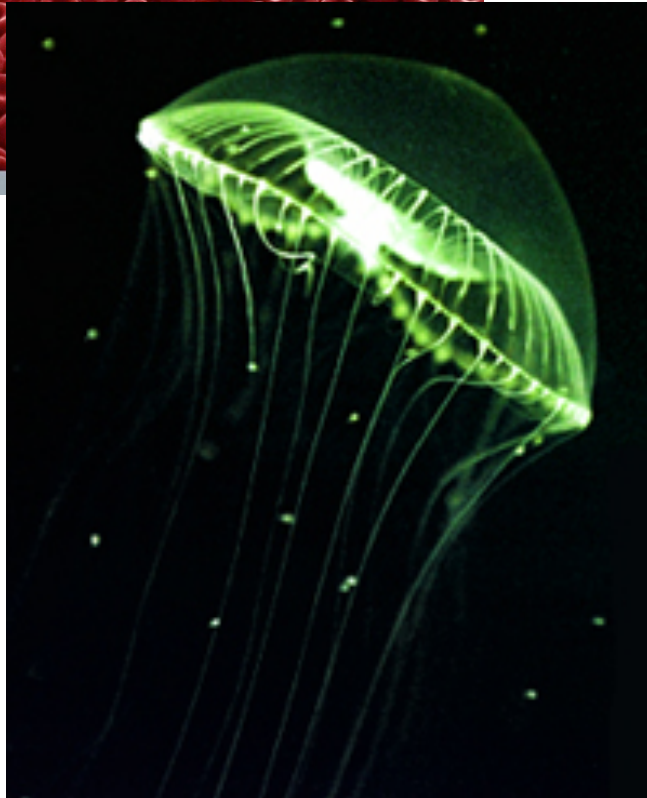
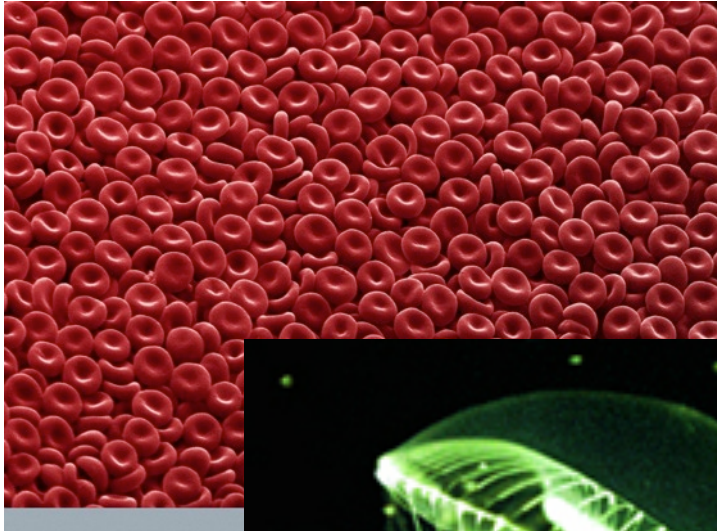


Synthetic biology: writing the future with biomolecules

Dek Woolfson, Chemistry and Biochemistry

🔥 From cells to genetic engineering...



graphics | Help Search

LIVE BBC NEWS CHANNEL

Page last updated at 17:20 GMT, Wednesday, 27 May 2009 18:20 UK

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Glowing monkeys 'to aid research'

By Jason Palmer
Science and technology reporter, BBC News

Genetically modified primates that glow green and pass the trait on to their offspring could aid the fight against human disease.

Though primates that make a glowing protein have been created before, these are the first to keep the change in their bloodlines.

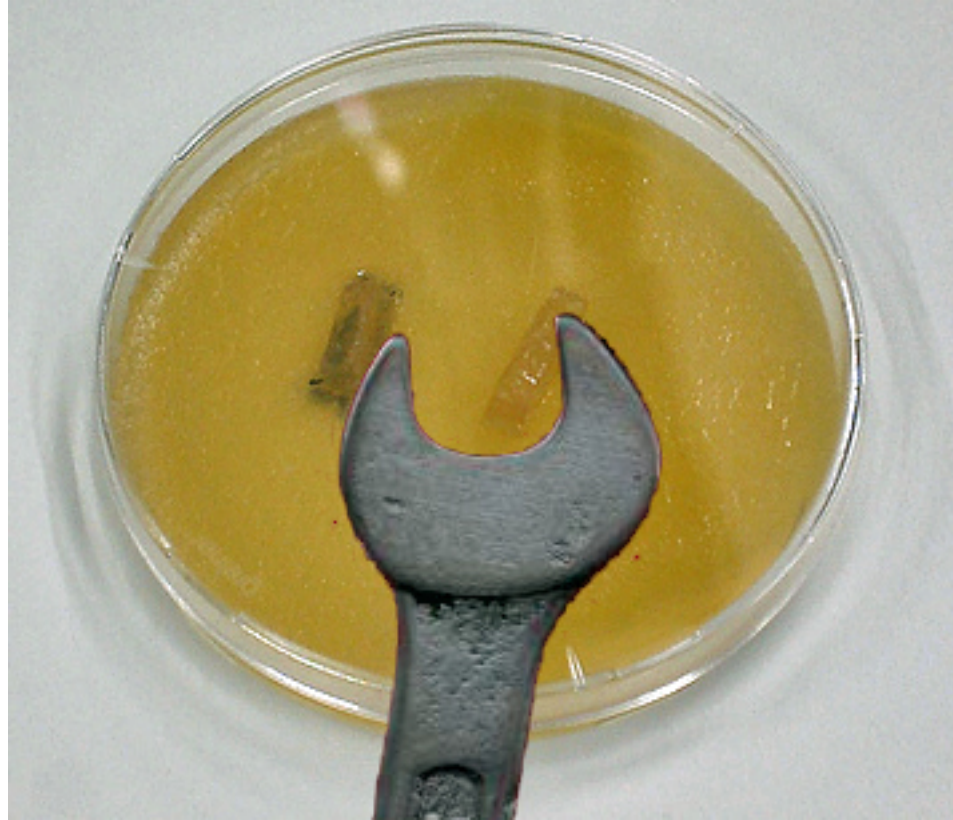
Future modifications could lead to treatments for a range of diseases.

The "transgenic" marmosets, created by a Japanese team, have been described in the journal Nature.

A close-up photograph of a marmoset's feet, which are glowing with a bright green light. The background is dark, making the glowing feet stand out. The word "NATURE" is visible in the bottom right corner of the image.

The marmosets glow an eerie green under UV light

🔥 ...and on to synthetic biology

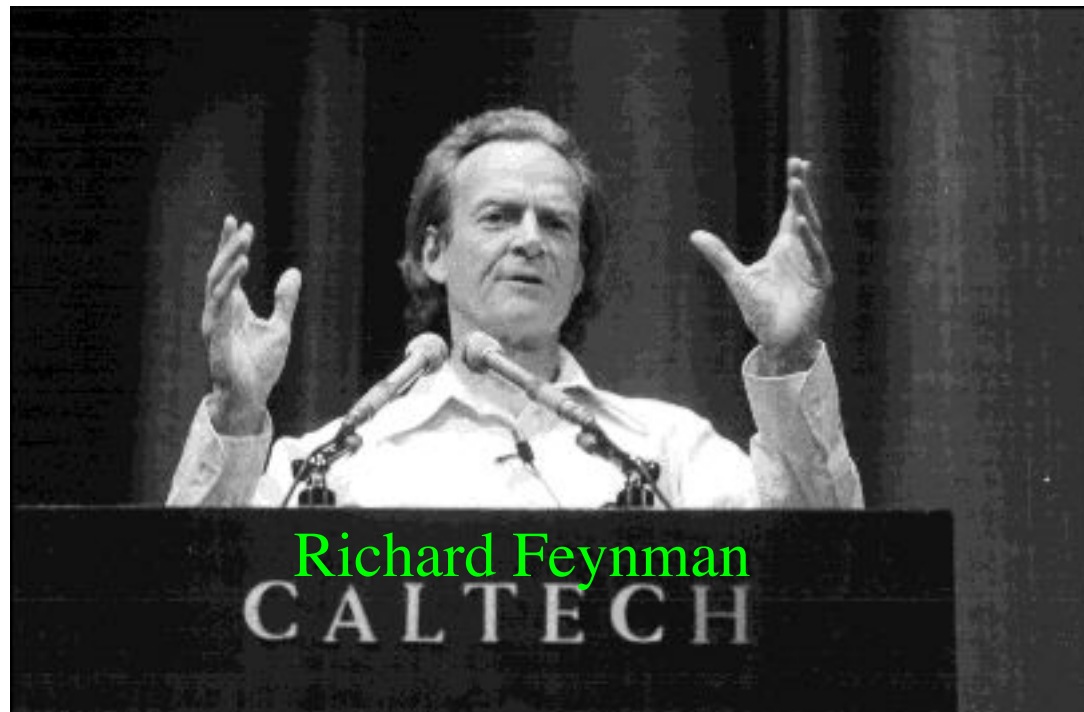


How do we make engineering biological systems easier, predictable and reliable?

🔥 Analogies and metaphors



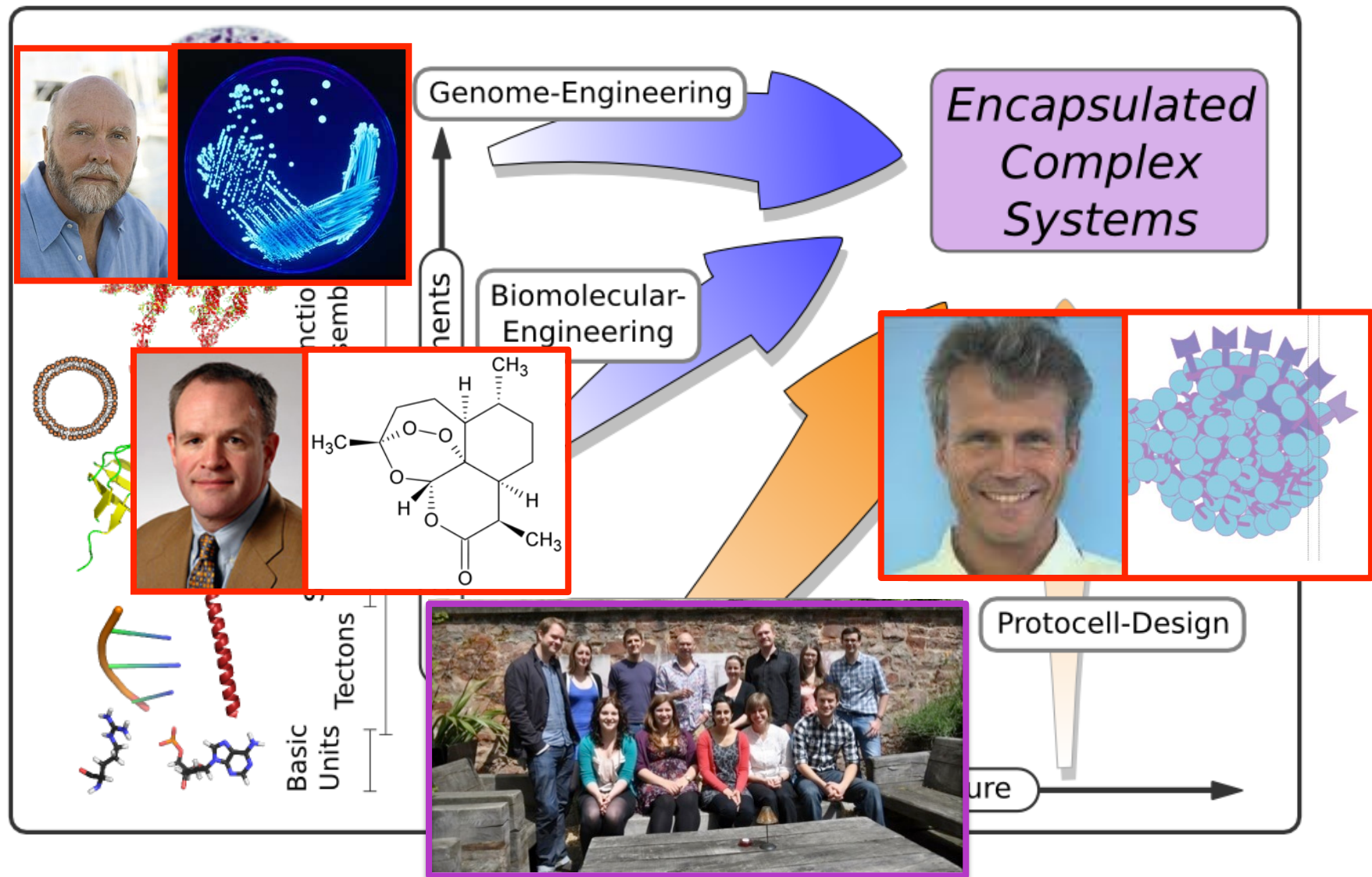
🔥 Why do this?



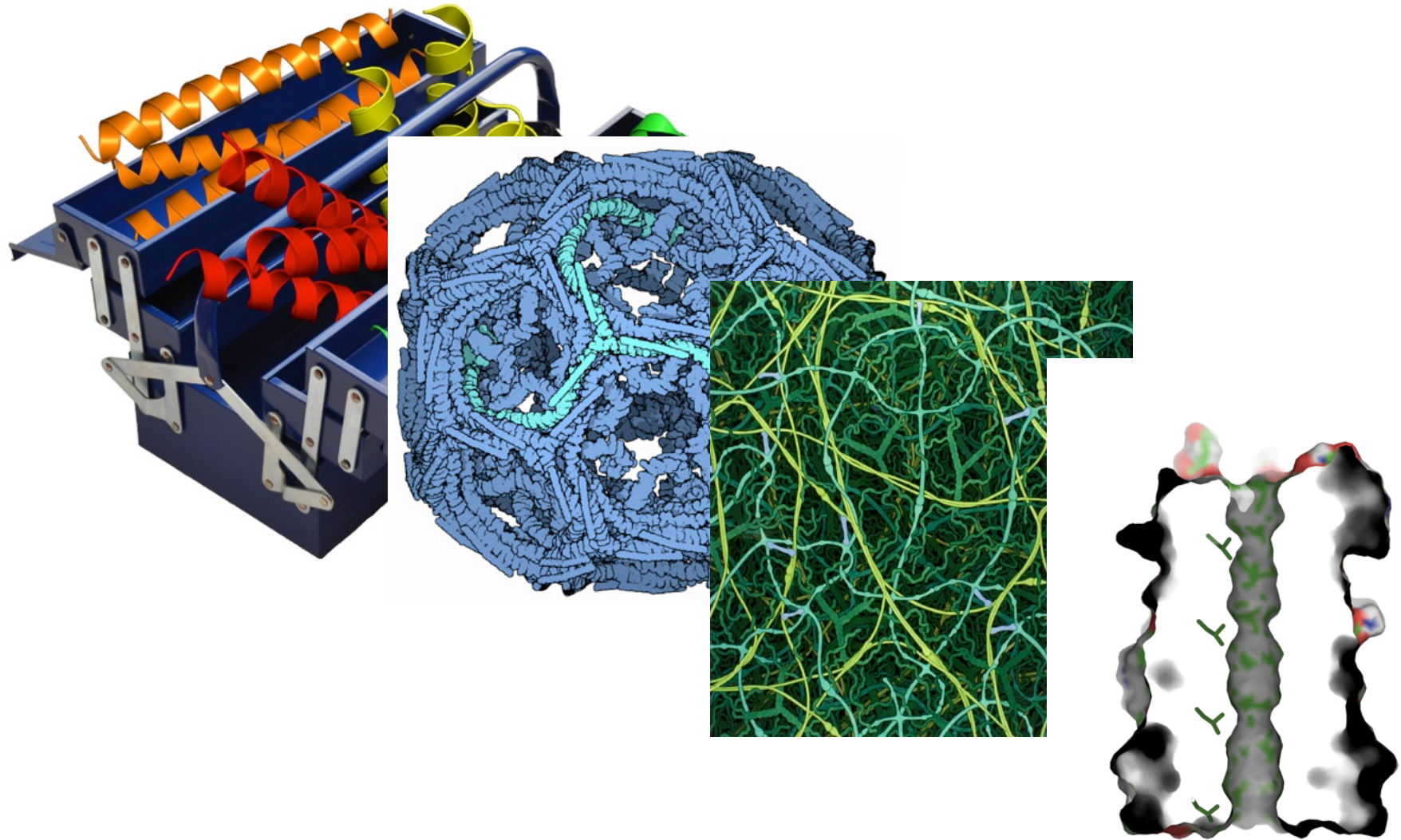
Courtesy of The Archives, California Institute of Technology

“What I cannot create, I do not understand”
The benefits could be considerable.

🔥 Approaches in synthetic biology

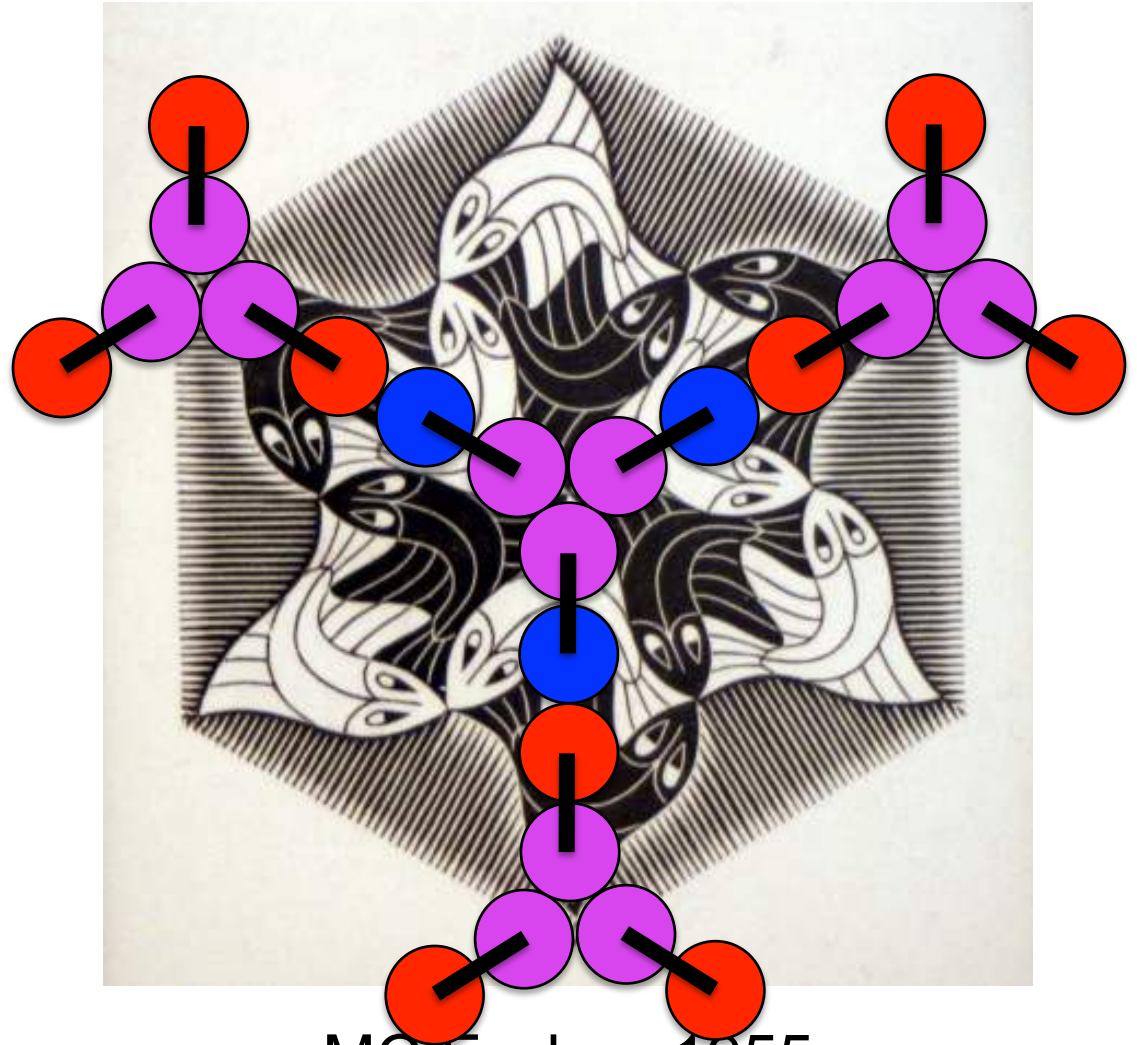
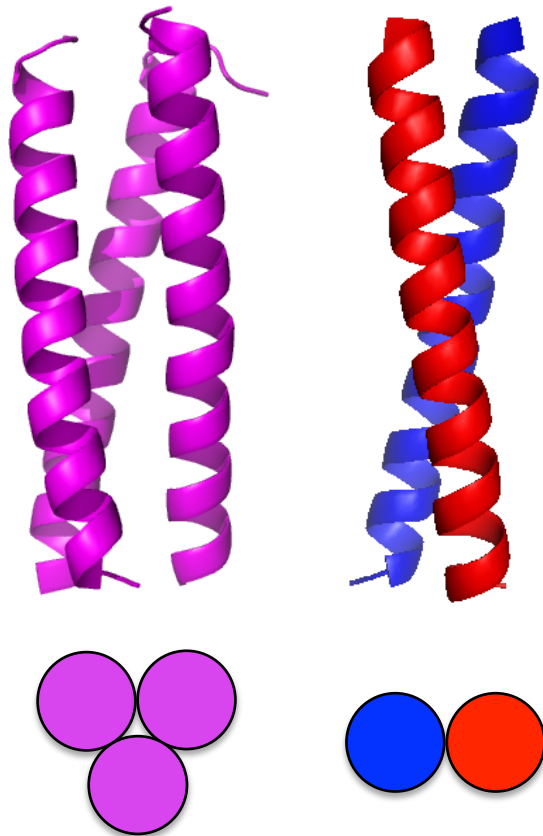


🔥 Synthetic biology in my lab

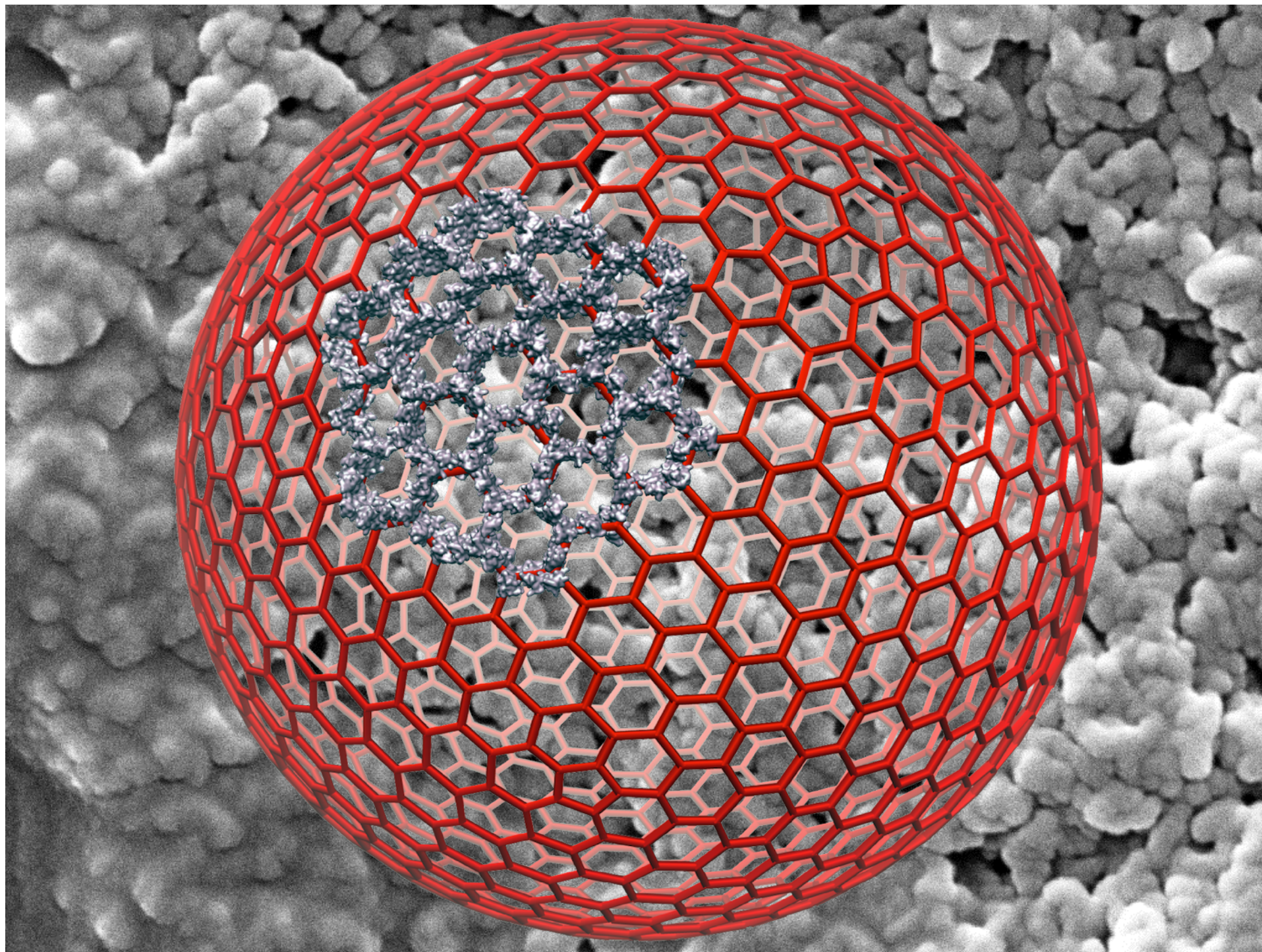


a protein toolkit – building cell-like capsules – making gels – cell-cell communications

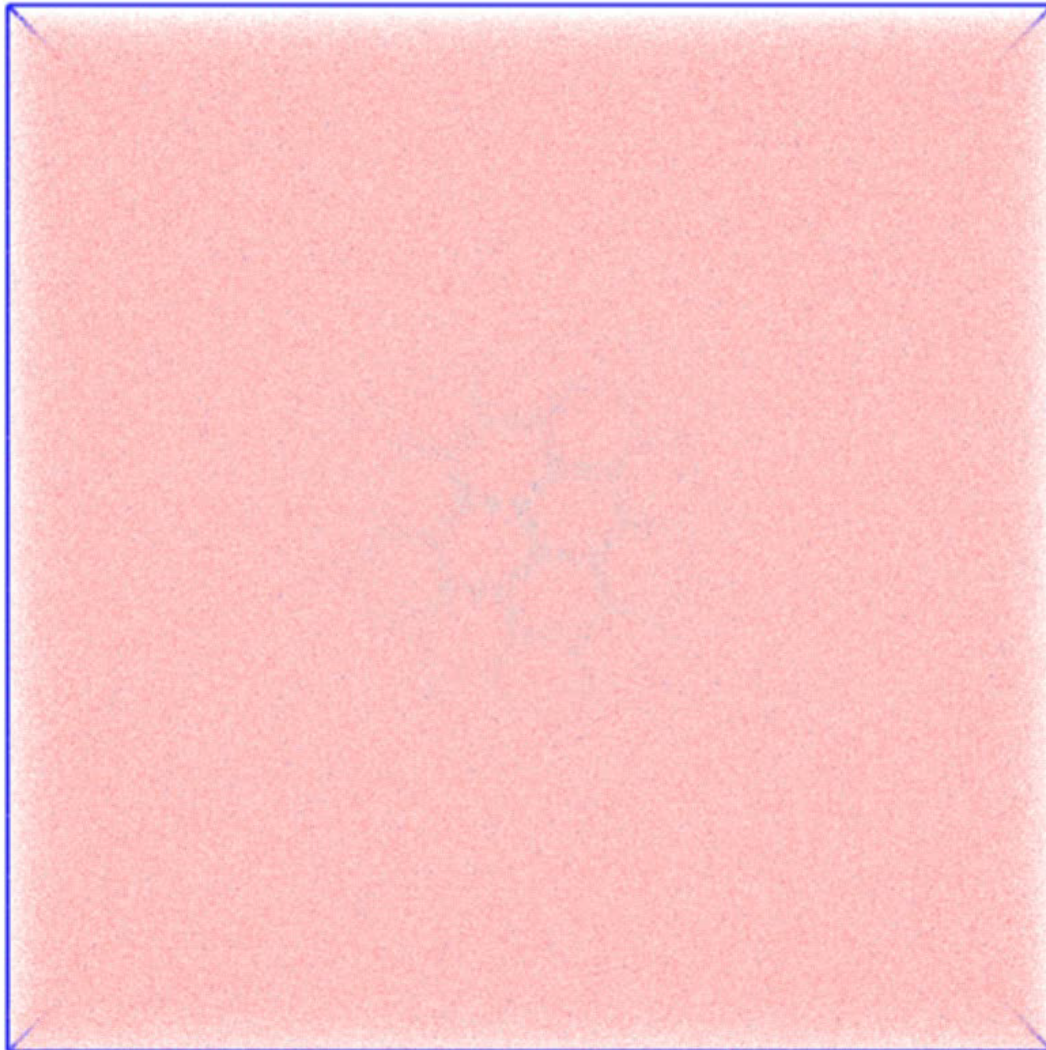
🌟 New delivery vehicles



MC Escher, 1955

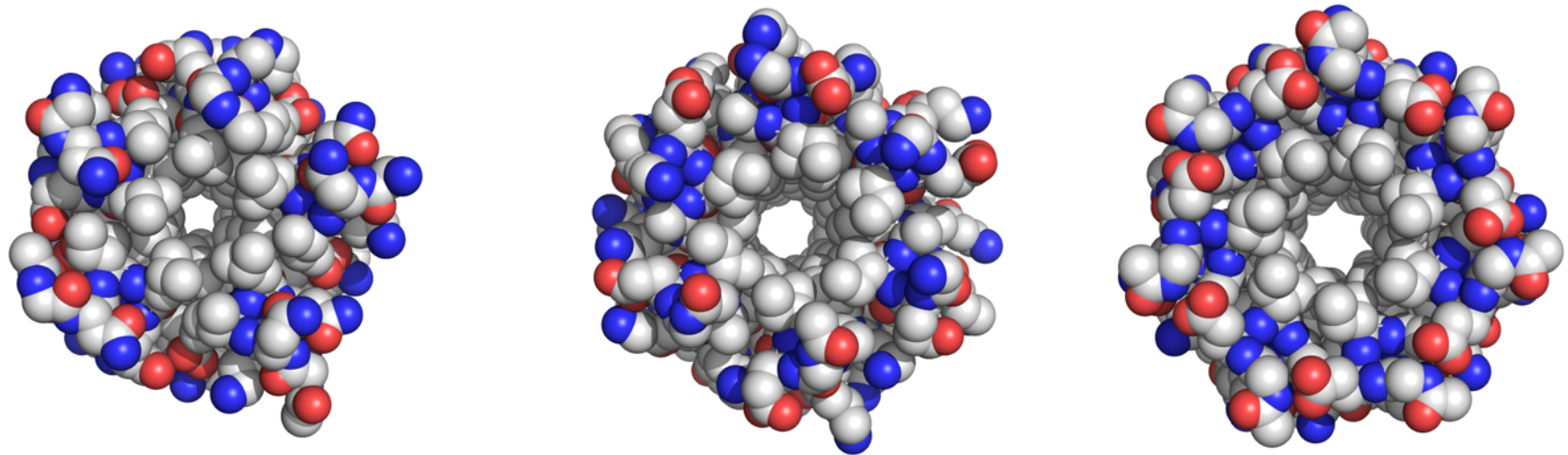


🔥 How we will use these “SAGEs”



- Virus-like particles
– vaccine
development
- Targeted delivery
of bioactive
molecules to cells
- Enzyme
encapsulation
in living cells

🔥 New proteins



<http://www6.slac.stanford.edu/ExploringSLACScience.aspx?id=dark>

“UK SynBio”

- 2007: 7 Synthetic Biology Networks
- 2012: Syn Bio Roadmap for the UK
- 2013: “Eight Great Technologies”
- 2013: IKC for Synthetic Biology (Imperial-led)
- 2014: 5 Centres for DNA synthesis
- 2014: 3 Syn Bio Research Centres
 - 3 more to follow
- 2014: CDT in Synthetic Biology (thank you)
- Responsive-mode funding (please)



European Research Council
Established by the European Commission

🔥 Getting the messages across



Left to right: Robert Edwards, Helena Paul, Daisy Ginsberg, Lionel Clark and Dek Woolfson (big screen) debate synthetic biology (MPP Image Creation)