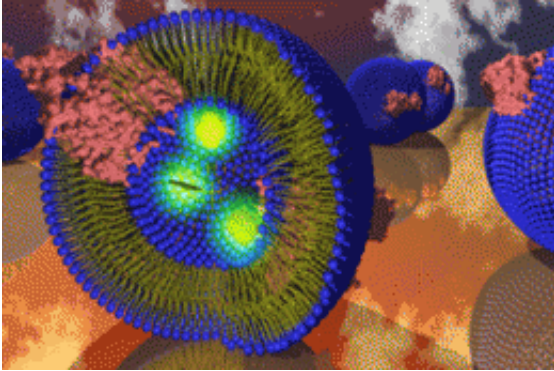


Creating energy from light and air

May 8 2012



An artistic representation of submicron lipid vesicles filled with fluorescent molecules, reproduced by permission of Lars J C Jeuken and The Royal Society of Chemistry from *Soft Matter*, 2011, 7, 49-52, DOI: 10.1039/C0SM01016B

Researchers from the University are studying how to make electricity from electrodes coated in bacteria, and other living cells, using light or hydrogen as the fuel.

The aim of the research long-term is to develop more efficient [biofuel cells](#), seen as the future of electronics. Because biofuel cells are powered by readily available biological materials, they have the potential to be used indefinitely when electricity is required at places where it is not possible to replace a battery or recharge them.

Most biofuel cells create electricity using enzymes that process glucose, but the Leeds research will focus on bacterial enzymes that can harness

light or hydrogen gas to create energy. The work is funded by a £1.42m grant from the European Research Council.

Lead researcher, Dr Lars Jeuken, from the Faculty of Biological Sciences, says: "Technology that creates an electrical signal from a biochemical reaction is already in commercial use, for example in blood glucose biosensors. However, developing an efficient biofuel cell that can create sufficient electricity for general use has proved much more difficult. This is mainly because the systems developed to date have only limited control of how inorganic materials and biological molecules interact.

"Our research combines state-of-the-art surface physics, colloid and organic chemistry, membrane biology and electrochemistry to develop [electrodes](#) with complete control of the biochemical interactions needed to create [electricity](#). We now want to apply this to membrane proteins to generate energy from [light](#) and [hydrogen](#)."

Dr Jeuken's research will also contribute to a new Interdisciplinary Centre for Microbial Fuel Cells (ICMFC), set up jointly between the Universities of Leeds, Sheffield and York. The Centre will bring together chemists from York, biophysicists such as Dr Jeuken from Leeds and engineers from Sheffield, to work together on improving the performance of microbial fuel cells, using a combination of synthetic biology and nanoengineering.

Provided by University of Leeds

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