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KTA Collaborative R&D Awards Case Study

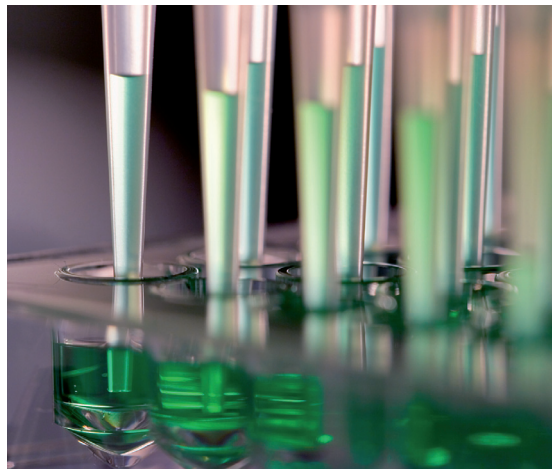
Developing New Bio-Electricity Technologies for the Renewable Energy Sector

Project partners

EPSRC Knowledge Transfer Account,
University of Sheffield
Dr Ruth Hambleton, KTA Business
Development Manager

Department of Chemical and Biological
Engineering, University of Sheffield
Professor Phillip C. Wright (PI) and
Dr Ana G. Pereira-Medrano (Project
Researcher)—Proteomics and Systems
Biology Laboratories, detecting and
profiling proteins found in biological
systems to understand the dynamic
functions and pathways within the
system. Using biological engineering
and synthetic biology, the scientific
team strive to increase the 'expression'
of proteins/metabolites for industrial
applications.

Ortus Energy Dr Neville Hargreaves,
CEO, Ortus Energy (www.ortusenergy.com). Established in 2009, Ortus Energy funds and commercialises breakthrough science in the renewable energy sector. Working closely, in partnership, with UK and international universities, Ortus strategically selects technologies, such as bio-photovoltaics, to develop and integrate into the energy supply chain.



ORTUSENERGY

Strategic need

Ortus Energy is constantly seeking to develop robust routes to generate clean energy technologies. By applying the University's biological systems analysis expertise to measure protein expression, the company hopes to understand the relevant genes involved in electricity generation in certain strains of bacteria. With this knowledge our scientists can develop and introduce biological modules to gene targets in non-electrogenic bacteria, hopefully stimulating exoelectrogenic (electricity generating) behaviour.

Technical request

Using quantitative proteomic analysis, Ana was asked to determine which bacteria genes are involved in electrogenic behaviour. She then designed a biological module, with the help of the knowledge of these target genes, and inserted the module into non-electrogenic bacteria to test its impact on power output.

Project activities

Ana spent 3 months, full time, working on behalf of Ortus. After obtaining the cell samples, she carried out the quantitative proteomic analysis. These results provided a database to analyse and determine gene targets. As a result, a list of identified genes, pathways and proteins was created, linking the

electrogenic behaviour of electrogenic bacteria. One gene was synthesised elsewhere and transformed into a non-electrogenic bacteria to determine its impact on power output.

Outcomes

- This 'Collaborative R+D' project was co-funded by Ortus Energy, the company (33%), and the University of Sheffield's EPSRC Knowledge Transfer Account (66%). It helps to further develop the research relationship between the two parties by opening up new streams of activity of commercial interest to Ortus.
- Two additional biological modules were designed during Ana's work, over and above original proposal. These have not yet been tested.
- The project introduced Ortus to a novel technique (quantitative proteomics) for identifying new gene targets, used in the development of new technologies. Several additional new designs and improved alternatives are possible to obtain from these results.

Contact us

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