BACKGROUND
Current methods for engineering microbial cell ‘factories’ involve overexpression of particular metabolic-pathway genes, elimination of enzymes and balancing cellular energy between production and normal physiological activities. Although there are successful cases, developing microorganisms into cellular ‘factories’ for commercial-scale chemical productions is costly and extensively time- and resource consuming.

Our promising mechanism to overcome these limitations involves harnessing evolution to engineer high-producing yeast cell factories.

OUR SOLUTION
This methodology enables the creation of producer strains of yeast at a fraction of the time and cost normally associated with this work. Because the creation of high-producer strains is driven by evolution, this process is not limited by the current state of biological knowledge. It therefore enables the engineering of producer strains that would otherwise be impossible to create at this point in time.

It makes use of a biosensor (genetic switch involving WAR1 protein) to detect yeast cells that intracellularly produce important industrial oil derivatives (organic acids). Increased yields of such products result in increased synthesis of a Green Fluorescent Protein (GFP), which can then be quantified using standard Fluorescence Activated Cell Sorter (FACS) procedures. High producers can be isolated from a population of genetically diverse yeast cells with varied chemical production capacity.

APPLICATIONS
✓ Screen yeast cells that produce valuable chemicals
✓ Create superior chemical producing yeast

INTELLECTUAL PROPERTY POSITION
Inventors: Dr Thomas Williams and Prof Ian Paulsen
PCT Publication: WO/2017/193164 Biosensor system

PARTNERING OPPORTUNITY
We are seeking to out-license this technology to an industry partner with interest and expertise in the development of biosensors for screening of chemical producing microbes.

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ADVANTAGES | BENEFITS
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Less time | Relates to national priority of ‘Advanced Manufacturing’
Low cost | Can generate novel biological systems for the production of industrial chemicals
Sustainably produce industrial products derived from organic acids | Independent of non-renewable resources such as oil
Not limited by current knowledge | Enables engineering solutions that are not currently available or understood

PUBLICATIONS

WOULD YOU LIKE TO KNOW MORE?
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