Aston University
Business Partnership Unit

Commercial Opportunity

Engineered Yeast Strains

Aston University researchers have discovered a method of increasing the production of heterologous proteins in eukaryotic expression systems and in particular in *Saccharomyces cerevisiae* and potentially other yeast species. This increased yield may bring significant cost and efficiency savings when producing exogenous proteins for example in the biotechnology and pharmaceutical industries. Aston's Business Partnership Unit is now actively seeking commercial partners to license this highly promising discovery.

Highlights

- Many low-expression targets can be made profitable and commercialized
- Increased yield of exogenous proteins
- Reduced energy and resource requirement per gram of exogenous protein produced
- Potential cost and efficiency savings

Background

Yeast is an established industrial fermentation system and supports high-level recombinant protein production. Yeasts are attractive hosts for the production of heterologous proteins. Unlike prokaryotic systems, their eukaryotic subcellular organization enables them to carry out many of the post-translational folding, processing and modification events required to produce "authentic" and bioactive mammalian proteins. In addition, they retain the advantages of a unicellular microorganism, with respect to rapid growth and ease of genetic manipulation. Aside from the baker's yeast *Saccharomyces cerevisiae*, an increasing number of alternative non-*Saccharomyces* yeast species are used as expression systems in basic research and for industrial application. These include *Hansenula polymorpha*, *Kluyveromyces lactis*, *Pichia pastoris*, *Schizosaccharomyces pombe*, *Schwanniomyces occidentalis* and *Yarrowia lipolytica*. Since the profit margin available on exogenously expressed proteins is dependent on protein yield, there is an ongoing search for yeast strains which show improved protein production. Two possibilities exist for increasing production: engineering a protein to make it more amenable to production, or understanding the host response in order to engineer improved strains.

The Technology

Scientists at Aston University have discovered that *BMS1* upregulation can significantly improve the production of recombinant proteins in eukaryotic cells. In particular, proteins that are produced at low level in wild-type yeast gain a boost, and all proteins investigated to date have an increase in yield of between 5 to 80 fold. This increased yield of recombinant protein may lead to significant cost and efficiency savings for industrial producers of recombinant proteins.

Intellectual Property Protection

This technology is the subject of an international patent application:

Title	*Pending Patents*	*Priority Claimed*	*Our Ref*
Protein Expression System (PES)	PCT/GB2009/001785	July 17, 2008	PAT-2007-008

Further Information

Further information can be made available and commercial discussions commenced on entering into a non-disclosure agreement.

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