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Cheaper insulin production proposed for emerging markets

Direct link to the News/Story:-

<http://www.in-pharmatechnologist.com/content/view/print/305704>

Related topics: Ingredients, excipients and raw materials, Processing (automation, control, separation)
Researchers have developed an alternative, cheaper method of producing insulin to help increase availability in emerging markets.

Diabetes is increasingly prevalent in emerging markets, notably India, and lowering the cost of production is viewed as one way to ensure these patients have access to insulin.

A team of researchers from Germany, Italy, India and Pakistan believe [a paper they published in the journal *Microbial Cell Factories*](#) can help further these efforts. Details of the manufacturing process have been published in an open access journal to ensure information is freely available.

The new manufacturing method produces insulin precursor in *Pichia pastoris*. Other methods of insulin production involve expression by *Escherichia coli* or in a yeast-based system using *Saccharomyces cerevisiae*.

Using *Pichia pastoris* to express insulin precursor offers several advantages over the more established yeast-based system, *Saccharomyces cerevisiae*, according to the researchers.

Firstly, stable and high levels of recombinant protein production are supported by *Pichia pastoris*' capacity to reach high cell densities using simple cultivation strategies. Also, *Pichia pastoris* secretes few of its own proteins, making isolation of insulin precursor easier.

Recognising these benefits the researchers sought to boost the yield of insulin derived from precursor expressed by *Pichia pastoris*. To achieve this, a two-phase process using a glycerol batch and constant methanol fed-batch phase was used for the secretory precursor production.

Adopting this system increased precursor levels to more than 200 per cent of the highest previously reported yield from *Pichia pastoris*. To maximise insulin precursor capture from the culture supernatant the researchers used immobilised metal ion affinity chromatography (IMAC).

Using this novel approach the researchers recovered 95 per cent of the secreted product with a purity of 96 per cent. The purified precursor was trypsin digested, transpeptidated, deprotected and further purified to achieve 1.5g of 99 per cent pure insulin per litre of culture broth.