

## Thermostable sucrose phosphorylase

**Ghent Bio-Energy Valley, a consortium of research laboratories of Ghent University, is seeking partners interested in the industrial and enzymatic production of glycosides or glucose-1-phosphate at temperatures of 60°C or higher using a thermostable phosphorylase.**

### Introduction

Sucrose phosphorylase catalyses the reversible phosphorolysis of sucrose into  $\alpha$ -glucose-1-phosphate and fructose. Because of the broad acceptor specificity of the enzyme, it can further be used for the production of a number of glycosylated compounds. At the industrial scale, such production processes are preferably run at 60°C or higher, mainly to avoid microbial contamination. Unfortunately, no sucrose phosphorylases are known yet which perform well at such high temperatures.

### Technology

Researchers at Ghent University have identified a thermostable sucrose phosphorylase derived from the prokaryote *Bifidobacterium adolescentis* which performs well at 60°C or higher. The enzyme is active for at least 16h at 60°C when it is in the continuous presence of its substrate, and/or, when it is mutated at specific residues, and/or, when it is immobilized on a carrier or when it is immobilized by cross-linking so that it is part of a so-called “cross-linked enzyme aggregate (CLEA)”.

### Applications

Enzymatic and/or recombinant methods to produce high value glycosides at elevated temperatures.

### Advantages

- being able to produce glycosylated compounds at high temperatures avoids microbial contamination;
- recycling of the immobilized biocatalyst in consecutive reactions increases the commercial potential.

### Status of development

The sucrose phosphorylase of *B. adolescentis* was recombinantly expressed in *E. coli* and further purified. In addition, the enzyme was immobilized on an epoxy-activated enzyme carrier (Sepabeads EC-HFA) or was incorporated in a CLEA or was mutated to obtain enzyme variants. Enzymatic activity of all forms and variants of the sucrose phosphorylase was determined under different conditions.

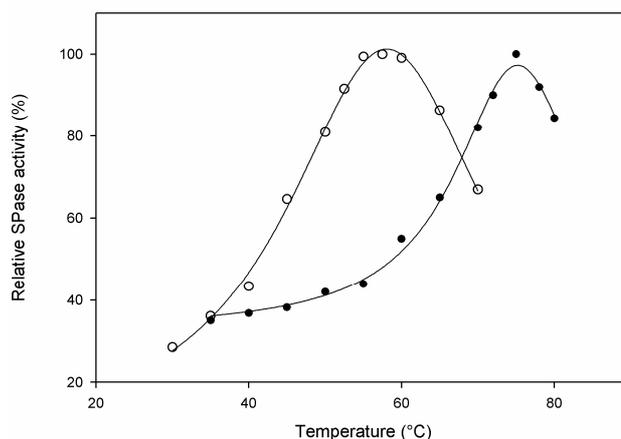
### Partnership

UGent is seeking a partner for further validation and upscaling of the present methodology.

### Intellectual property

A PCT application covering a sucrose phosphorylase from *B. adolescentis* being enzymatically active for at least 16 h at 60°C, methods to produce said sucrose phosphorylase and uses thereof, was filed on April 1, 2011 (priority dates of April 6, 2010, June 30, 2010, December 9, 2010 and February 14, 2011)

### Figure



The effect of temperature on the activity of soluble (○) and immobilized (●) SPase from *B. adolescentis*. Reactions were performed with 0.1 M sucrose in a 0.1 M phosphate buffer at pH 7.

### The Inventor(s)

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### References

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### Keywords

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