# Improvement of the thermostability of a highly active GH16 glucanase without losing catalytic performance via alanine substitution

Zhiyuan Bai[1], Shuai You[1,2], Richard Ansah Herman[1], Wenxin Zhang[1], Ziqian Zha[1], Yan Ge[1], Jun Wang[1,2]*

[1] School of Biotechnology, Jiangsu University of Science and Technology, Zhenjiang 212018, P R China;
[2] Sericultural Research Institute, Chinese Academy of Agricultural Sciences, Zhenjiang 212018, P R China;
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Presenting author email: wangjun@just.edu.cn.

## Abstract

As an important industrial enzyme, glucanase is widely used in the fields of kitchen waste treatment, food processing and as feed additives. Improving the thermostability of glucanase through enzyme engineering methods to obtain heat-resistant glucanase is of great significance to its industrial application and cost saving. This study effectively improved the thermal stability of the enzyme from the perspective of protein surface charge optimization. The mechanism of the three charged amino acids D28, D194 and D234 in the GH16 glucanase on the thermostability of the enzyme was confirmed. A glucanase with high thermal stability and high catalytic activity is obtained, eliciting conditions for the application of glucanase in waste treatment, food processing and feed addition.

**Keywords：** GH16 glucanase; Enzyme engineering; Thermostability; Protein surface charge optimization