**C-terminal proline-rich sequence broadens the optimal temperature and pH ranges of xylanase from *Geobacillus thermodenitrificans* C5**

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## Abstract

Efficient degradation of plant polysaccharides requires xylanolytic enzymes with a high catalytic capacity. In this study, Proline sequence was fused with a C-terminal of xylanase genefrom GthC5Xyl. To determine its function, both GthC5Xyl and GthC5XylProl were expressed in *Escherichia coli* Bl21 host. The C-terminal oligopeptide had significant effects and simultaneously broadens the Optimal Temperature and pH Ranges and improves the specific activity of GthC5Xyl. Compared with GthC5Xyl, GthC5XylProl exhibited improved specific activity, a higher temperature optimum (70°C versus 60°C), Higher pH optimum (8 versus 6), and broader ranges of temperature and pH optima (pH 6.0 to 9.0 and 60°C to 80°C versus pH 5 to 8 and 40°C to 60°C). The modified enzymes showed 85% of maximal activity after incubating in xylan substrate for 3 h at 80°C compared to only 45% activity for wild-type enzyme. Moreover this study reveals an engineering strategy to improve the catalytic performance of enzymes. Our study demonstrated that properly introduced proline residues on C-terminal surface of xylanase family might be very effective in improvement of enzyme thermostability.

## Biography

Muhammad Irfan is doing PhD from Department of Microbiology, Quaid-i-Azam University Islamabad Pakistan. He also got a split scholarship from Tubitak and did his research from Karadeniz Technical University Turkey.

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