

A comparative analysis of microgravity and earth grown thermostable T1 lipase crystals using HDPCG apparatus

ABSTRACT

Geobacillus zalihae sp. nov., which produces a putative thermostable lipase, represents a novel species, with type strain T1. The characterisation of this intrinsically thermostable T1 lipase either physicochemically or structurally is an important task. The crystallisation of T1lipase in space was carried out using a High-Density Protein Crystal Growth (HDPCG) apparatus with the vapour diffusion method, and X-ray diffraction data were collected. The microgravity environment has improved the size and quality of the crystals as compared to earth grown crystal. The effect of microgravity on the crystallisation of T1 lipase was clearly evidenced by the finer atomic details at 1.35 Å resolution. Better electron densities were observed overall compared with the Earth-grown crystals, and comparison shows the subtle but distinct conformations around Na(+) ion binding site stabilized via cation- π interactions. This approach could be useful for solving structure and function of lipases towards exploiting its potentials to various industrial applications.

Keyword: HDPCG; Microgravity; Thermostable T1lipase