

GEOBACILLIN 19, NOVEL BACTERIOCIN FROM A THERMOPHILIC BACTERIUM

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The genus *Geobacillus* is represented by obligately thermophilic bacteria able to grow in the temperature range of 35–75°C. Growth at high temperatures makes *Geobacillus* species promising agents in biotechnological processes. They can be sources of various thermostable enzymes. Also, *Geobacillus* spp. can produce bacteriocins, it is ribosomally synthesized antimicrobial peptides or proteins, which has narrow antagonistic activity spectrum against bacterial strains closely related to the strain-producer. The activity of bacteriocins against foodborne and pathogenic bacteria opens wide opportunities for their application in medicine and food industry [1].

Little is known about bacteriocins of thermophilic bacteria. *Geobacillus stearothermophilus* 15 produces two bacteriocins geobacillin 26 (Geo26) and geobacillin 19 (Geo19). Whereas Geo26 have been well characterized and its amino acid sequence determined [2], native Geo19 still needed characterization. In this study we tested several different growth mediums for bacteriocin production and purification. After medium optimization different protein chromatographic strategies have been used to purify Geo19. Using mass spectrometry analysis, we determined the amino acid sequence of Geo19. Bioinformatics tool BLASTp at NCBI database revealed gene sequence coding Geo19 protein in the genome of *Geobacillus stearothermophilus* 15. Our focus now is in cloning and heterologous expression of recombinant Geo19 in *Escherichia coli* for further characterization.¹

[1] G. Novik, V. Savich, and O. Meerovskaya, "Geobacillus Bacteria: Potential Commercial Applications in Industry, Bioremediation, and Bioenergy Production," 2018.

[2] M. Vaičiškaitė *et al.*, "Geobacillin 26 - high molecular weight bacteriocin from a thermophilic bacterium," *Int. J. Biol. Macromol.*, vol. 141, pp. 333–344, Dec. 2019.