

## **Characterization of a putative antimicrobial peptide from an Antarctic bacterium**

### **ABSTRACT**

The search for new antibiotics is a continuous effort since its discovery. Nevertheless, the speed of discovering novel antibiotics cannot match the speed of bacteria acquiring antibiotic resistance. Hence, the search efforts have broadened to include all compounds with antimicrobial activities. The toxin-antitoxin (TA) gene products are the potential antimicrobial compounds worth analyzing. The TA system consists of a set of genes found either in the chromosome or plasmid, or both. At the moment, the toxin, a peptide from this system is known to kill some hosts that either encountered stress or have lost the plasmid carrying the TA genes. In a previous study, it was found that an Antarctic bacterium, *Cryobacterium* sp. SO1 chromosome harbored a putative antimicrobial peptide-coding gene similar to a class II TA, pemK gene. However, it is not clear whether this antimicrobial peptide has cross-species antimicrobial activity. Therefore, this work aims to determine whether this PemK protein has antimicrobial properties or not. The pemK<sub>CryobacSO1</sub> gene was ligated to an arabinose-inducible promoter of the Topo pBAD plasmid and used to transform the *Escherichia coli* TOP10. The cloning of pemK inhibited the growth of the host *E. coli* TOP10 as the cells failed to grow. This indicated that PemK probably has a cross-species activity that inhibited the growth of *E. coli* apart from its original host *Cryobacterium* sp. SO1.