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# Cryoprotective Effect and Partial Characterization of a Novel Exopolysaccharide (P-ArcPo 20) Produced by *Pseudoalteromonas tetraodonis* Strain ArcPo 20

Sung Jin Kim

Sung Jin Kim<sup>1, 2</sup>, Byung-Gee Kim<sup>2</sup>, Ha Ju Park<sup>1</sup>, Joung Han Yim<sup>1</sup>

<sup>1</sup>Division of Life Sciences, Korea Polar Research Institute, Incheon, Korea  
<sup>2</sup>Interdisciplinary Program of Bioengineering, Seoul National University, Seoul

sungjin@kopri.re.kr

## ABSTRACT

Main body of the abstract Marine samples obtained from the Chukchi Sea, Arctic Ocean yielded 22 bacterial strains that secrete polysaccharides. Of those, seven strains produced cryoprotective exopolysaccharides (EPS). The strain ArcPo 20, identified as *Pseudoalteromonas tetraodonis* by 16S rDNA analysis, demonstrated the highest cryoprotective effect and was selected for the further study. The EPS, P-ArcPo 20, was purified by protease treatment and gel filtration chromatography. EPS characterization was confirmed by the gel permeation chromatography, gas chromatography-mass spectrometry and Fourier transform infrared spectroscopy analysis. The purified EPS (P-ArcPo 20) had a molecular weight of  $1.1 \times 10^7$  Da, and its infrared spectrum showed absorption bands of hydroxyl and carboxyl groups. The principal sugar components of P-ArcPo 20 were determined to be glucose, galactose, and mannose, in the ratio of 1.5:1.0:0.3. The P-ArcPo 20 cryoprotective activity was characterized using an *E. coli* viability test. In the presence of 0.5% (w/v) EPS, the *E. coli* cell survival ratio was  $91.22 \pm 4.21\%$  over five freeze-thaw cycles. These biochemical characteristics suggest that the EPS P-ArcPo 20 may be useful in cryoprotectant development for biotechnological and medical applications.

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