

**BP-9****Cryoprotective properties of exopolysaccharide (P-21653) produced by the Antarctic bacterium, *Pseudoalteromonas arctica* KOPRI 21653 in Red Blood Cell****Sung Jin Kim**, Phil Sung Kang, Hong Kum Lee, and Joung Han Yim\*

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25 bacterial strains that secrete mucous materials were isolated from sediment obtained from King George Island, Antarctica. Seven of these strains proved capable of producing cryoprotective exopolysaccharides. The strain KOPRI 21653 was selected for the further study. KOPRI 21653 was identified as *Pseudoalteromonas arctica* as the result of 16S rRNA analysis. The exopolysaccharide, P-21653, was purified completely from the KOPRI 21653 cell culture via column chromatography and protease treatment. The principal sugar components of P-21653 were determined to be galactose and glucose, at a ratio of 1:1.5, via GC-MS analysis. The cryoprotective activity of P-21653 was characterized via a red blood cell (RBC) LDH assay. In the presence of 0.5% (w/v) P-21653, the dead cell ratio of RBC was as low as  $20.83 \pm 2.83\%$  over three repeated freeze-thaw cycles. The dead cell ratio of RBC increased to 26.1%, respectively, in five repeated cycle conditions; however, the dead cell ratios of RBC were grater over ( $20.83 \pm 2.83 - 42.11 \pm 7.27\%$ ) in the presence of 0.5 - 0.2% (w/v) P-21653. In addition, at much lower concentrations (0.2 - 0.5%), P-21653 resulted in dead cell ratios of RBC were more less than generally employed as a RBC cryoprotectant (glycerol), which were utilized at the recommended concentrations (40%). The biochemical characteristics of exopolysaccharide P-21653 reflect that this compound may be developed as a useful cryoprotectant for use in medical applications.