

## Downsizing antifreeze proteins to antifreeze peptides from Antarctica inhabitants

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Some cold-adapted organisms are able to synthesize antifreeze protein (AFP) to enable them to survive in subzero environment. The ability of AFP to reduce the ice damage in cells has attracted interest in many applications for example medical and agriculture sectors. However, high capital cost in producing AFP may hamper them to be resourcefully used in industrial biotechnology. Lately, peptides that mimic the parent proteins have been designed and synthesized for many purposes. AFP type I from Antarctic yeast *Glaciozyma antarctica* and shorthorn sculpin fish, *Myoxocephalus scorpius* were downsized to functional several  $\alpha$ -helix antifreeze peptides. The short peptide segments derived from both AFPs gave high antifreeze activity and ice recrystallization inhibition. Molecular modeling of  $\alpha$ -helix antifreeze peptides on ice surface showed the straightforwardness of the peptides is related to the high antifreeze activity. These synthetic antifreeze peptides could be a new hope in food preservation and cryopreservation technology as it could inhibit the growth of ice crystals.

### Biography

Mohd Basyaruddin Abdul Rahman is currently the Professor of Chemistry at Universiti Putra Malaysia. He has received his PhD in Catalysis Chemistry in 1999 at the University of Southampton, England. He has developed skills in catalysis at synchrotron radiation in Daresbury and Grenoble, Protein Engineering at Osaka University and Structural Biology at the University of Edinburgh. His research areas include biocatalysis, protein chemistry, nanobiotechnology and computational chemistry. He is among the pioneer Chemists in this country to synergize experimental results with theoretical insights. He has published more than 170 cited papers and 300 proceedings in the wide field of biocatalysis. To date, he has filed more than 20 patent applications in Malaysia and 10 internationally. He has supervised and co-supervised more than 30 PhD and 35 MSc postgraduate students. He has won Young Scientist recognition from various bodies including ACS, IUPAC and IAP. He is currently the Founding Chairman of the Young Scientists Network and also being elected as the Fellow of the Academy of Sciences Malaysia.

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