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## Ice crystal growth inhibiting peptides from gelatin hydrolysate

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The ability of certain peptides derived from gelatin hydrolysate to inhibit ice crystal growth in a model ice cream mix was studied. Bovine hide gelatin (Type 225B40) was hydrolyzed using alcalase for 30 min at 37 °C and pH 7.0 at an (crude) enzyme to substrate ratio of 1:10. The hydrolysate was fractionated using size exclusion (Sephadex G-50) and ion exchange SP-Sephadex) chromatographic techniques. The molecular weight distribution of the peptide fractions was determined by the MALDI-TOF mass spectrometry. The inhibition of ice crystal growth in a model ice cream mix by the peptide fractions was studied by thermal cycling of the sample between -14 to -12 °C at the rate of one cycle per 3 min using a cold stage equipped with a microscope. Gelatin peptide fractions containing peptides in the molecular mass range of 800-2700 Da inhibited ice recrystallization in the ice cream mix. The cationic peptides of this fraction with molecular weight range of 1600-2400 Da were more effective than the anionic peptides. A 2107 Da cationic peptide with high ice crystal growth inhibitory activity has been isolated and its amino acid sequence has been determined. Molecular dynamics simulations were conducted to understand the mechanism of inhibition of ice crystal growth by short gelatin peptides.

## Biography

Srinivasan Damodaran earned his PhD in Food Science from Cornell University in 1981 and currently he is a Professor of Food Chemistry at the University of Wisconsin-Madison. He has published more than 150 papers in reputed journals and has 11 patents to his credit. He is the lead editor of "Fennema's Food Chemistry", a textbook that has been translated into Russian, Spanish, and Portuguese, and being used widely throughout the World.

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