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Study of peptides with calcium-chelating ability from enzymatic hydrolysis of isolated soy protein

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Calcium is the most abundant divalent cation in the human body. Several certain diseases have resulted from insufficient calcium uptake, such as rickets in children and osteoporosis in the elderly. Protein hydrolysates could form soluble complexes with calcium, which enhance its bioavailability. The purpose of this study was to fractionate and identify the peptides with calcium-chelating ability from Trypsin-Isolated Soy Protein Hydrolysate (T-ISPH). According to the preliminary study, T-ISPH was selected as the most potential candidate for calcium-chelating ability among 28 hydrolysates. Therefore, to begin with, T-ISPH was prepared by hydrolyzing ISP with trypsin at pH 7.5 and 50 °C for 8 hours. T-ISPH was further sequentially fractionated by 30 kD, 10 kD and 1 kDa Molecular Weight Cut-Off (MWCO) membranes. Calcium Chelating Increment (CCI) was evaluated for each fraction. The higher the CCI, the better the calcium-chelating ability is. The result indicated that 1 kDa permeate of T-ISPH (T-ISPH-1P) showed the highest CCI among 4 fractions. Furthermore, T-ISPH-1P was fractionated by Reverse-Phase (RP) chromatography and Immobilized Metal Affinity (IMA) chromatography, respectively. The result revealed that among the fractions of RP chromatography and IMA chromatography, RP2 and IIE2 had highest CCI of 2.97 and 3.27 mmol/mg protein, respectively. Finally, based on LC/MS/MS analysis of these two fractions, several peptides were identified as potential calcium chelating peptides.

Biography

Wen-Dee Chiang has completed his PhD from Clemson University, USA. He is the Professor of Food Science Department and the Dean of Agriculture College at Tunghai University, Taichung, Taiwan. He has published more than 43 papers in reputed journals and has been serving as a Reviewer for many international reputed journals.

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