

***Catostylus tagi*: a new marine collagen source**

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Purpose.

Isolation and preliminary biochemical characterization of collagen derived from the jellyfish *Catostylus tagi*, as an alternative biomaterial for the development of particulate drug delivery systems.

Methods.

An isolation and purification procedure of collagen obtained from the umbrella of *C. tagi* was developed, using pepsin digestion and consecutive steps of dialysis, ultracentrifugation and salting-out. Pure lyophilized samples, as confirmed by SDS-PAGE and hydroxyproline content, were analyzed in terms of amino acid composition and the primary structure of the protein was determined by N-terminal sequencing through Edman degradation. MW and charge of collagen α -chains were estimated by SDS-PAGE and IEC. Glycosylation of collagen was investigated using selected in-gel and glycoprotein carbohydrate estimation kits. A glass capillary viscometer was used to determine the thermal denaturation temperature.

Results.

Collagen samples were successfully isolated and the total freeze-dried umbrella was estimated to have an approximate collagen content of 2.7%. Pepsin allowed for the selective removal of the nonhelical telopeptides, resulting in a more soluble sample of reported lower antigenicity. Glycine was found to be the major amino acid, while glutamic acid, alanine, aspartic acid, proline and hydroxyproline contents were also significant. Moreover, since only 1% of aromatic amino acids were found, this collagen is expected to exhibit low immunogenicity upon injection. The finding of hydroxylysine in reasonable amounts suggested the presence of glycosylation sites in the collagen molecule, later confirmed by the glycosylation assays. N-terminal amino acid sequencing, performed for the first time in a jellyfish-derived collagen, confirmed the presence of the characteristic Gly-Xaa-Yaa repeating sequence. *C. tagi* collagen was shown to be a $\alpha 1\alpha 2\alpha 3$ heterotrimer. The MW of the α -chains, was 90kDa for two of the polypeptides, and 104kDa, for the third chain. However, the two chains presenting similar MW, showed different charge and primary structure. Thermal denaturation temperature of collagen was determined as 30.0°C.

Conclusion.

Results from this study are encouraging and provide an insight into the potential of jellyfish-derived collagen as an alternative source to the traditional bovine collagen for the development and production of polymeric matrixes for controlled drug delivery.

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