

Isolation and Characterization of Collagen Extracted from Fish Scales and Applied as Anti-TNF α Protein

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ABSTRACT

Background: In the recent years, the focus on taking out biologically active molecules from animals' byproducts, especially from marine organisms have been increased. These sources play a major role in extracting collagen to be used as a biomaterial for medical applications and in the food industry. However, collagen-producing firms can be found all around the world, but not all of them kind 100% pure collagen; instead, they make gelatin hydrolyzed collagen. These businesses lack additional collagen development. Therefore, extracting collagen from fish scales as a potential raw material and using it to study high-value applications might potentially produce an economic potential for anti-inflammatory protein.

Methodology: Isolation and characterization methods were undertaken when fish scales (450gm) were procured from a local market, then washed with distilled water several times to remove any dirt, dust, and unwanted materials from the scales. Then, they were soaked with (0.2 M) of NaOH₂ for 12 hours to get rid of non-collagen proteins. For demineralization purposes, they were immersed with (0.5 M) of HCl for 12 hours. Later, for digestion to be carried out (0.5 M) of acetic acid was added and drenched for about 36 hours with stirring performed at 4 °C. after the digestions step, the samples were filtered. Moreover, collagen was detected and characterized by the size exclusion chromatography (SEC) assay. Furthermore, the extracted collagen was used in vivo to detect fish-tumor necrosis factor (TNF α) to notice the effect of extracted collagen as an anti-inflammatory protein as a part of the medical application method.

Results: The SEC assay revealed that Col-I is purified and separated as soluble monomeric protein (53 min) fractions which correspond to a molecular weight of roughly 300 kDa. Also, the result indicated a mild significant decrease of collagen on TNF α (down-regulation).

Conclusion: In summary, we conducted to use collagen for biomedical and pharmaceutical purposes as an anti-inflammatory.

Keywords: Fish scale, TNF α , Collagen, Biomedical, Chemical action, Inflammatory agents

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