BUTLEROV HERITAGE

Butlerov Communications C
Advances in Biochemistry & Technologies
ISSN 2074-0948 (print)

2021. Vol.1, No.2, Id.13.
Journal Homepage: https://c-journal.butlerov.com/

Thematic section: Biochemical Research.
Subsection: Medical Chemistry.

Full Paper

The Reference Object Identifier – ROI-jbc-C/21-1-2-13
The Digital Object Identifier – DOI: 10.37952/ROI-jbc-C/21-1-2-13
Received 20 May 2021; Accepted 22 May 2021

Assessment of hydroxyproline content dynamics in inflammatory and degenerative joint lesions

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Keywords: hydroxyproline, collagen, resorption.

Abstract

Collagen is an intercellular substance of connective tissue and has an important role in physiological processes of the body. Collagen is three polypeptide chains twisted into a helix, and for stabilization of this structure, hydroxyproline is necessary, its hydroxyl groups participate in the formation of hydrogen bonds between polypeptide chains. A characteristic feature of collagen is that 14% of the amino acids it contains are oxyproline, an amino acid that is not present in other proteins. In human and animal blood, oxyproline is found in free, peptide- and protein-bound forms. It is found in tissues only as part of collagen, which accounts for most of the protein in mammals. In terms of physico-chemical properties, the oxyproline-containing protein of blood is similar to collagen and is therefore called the collagen-like protein of blood plasma. Therefore, oxyproline content in blood serum was used to evaluate collagen metabolism in the body.

We determined the content of hydroxyproline in blood serum and its fractions. When studying the content of total hydroxyproline in blood it is difficult to conclude which process in the connective tissue prevails – destructive or reconstructive. The content of total hydroxyproline reflects the total amount of its different components – free and hydroxyproline bound to proteins. It was noted that the content of total hydroxyproline and protein-bound hydroxyproline in patients with degenerative joint disease was 30-40% lower compared to the indicator of healthy patients, indicating clearly occurring destructive processes in the joint for the period of the disease.

For citation: Petr P. Purygin, Yulia V. Golub, Konstantin S. Mochalov, Danila O. Lipatov, Vladislav I. Korunas, Regina R. Kamilova. Assessment of hydroxyproline content dynamics in inflammatory and degenerative joint lesions. *Butlerov Communications C.* **2021**. Vol.1. No.2. Id.13. DOI: 10.37952/ROI-jbc-C/21-1-2-13

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