Review article

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BLUE MOONLIGHTING IN THE IMMUNE RESPONSE: ROLES OF COPPER AND CERULOPLASMIN IN THE PATHOGENESIS OF INFLAMMATION AND IMMUNE-MEDIATED DISEASES

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Increase in serum copper levels and/or its main blood carrier - ceruloplasmin (Cp) is a constant finding in some human diseases. One of the best-known roles of Cp is the regulation of cellular iron efflux in situations of hypoxia. Nevertheless, copper and Cp are involved in multiple physiological processes, such as redox balance, regulation of transcription factors, neuronal growth, some immune functions: microbicidal activity, cytoprotective barrier, lymphocyte proliferation, etc. Ceruloplasmin is an acute phase reactant and therefore its levels increase in conditions of acute infections or inflammation. Also, copper dyshomeostasis has been clearly established in many inflammatory autoimmune diseases, malignancies, neurological and obstetric disorders. Changes of copper and Cp metabolism are reported in the pathogenesis of diabetes mellitus and cardiovascular diseases. Besides, alterations of serum copper can be utilized as a prognostic and predictive biomarkers. However, interpretation of these data is not fully recognized in the routine clinical practice. Therefore, the aim of our work is to review current knowledge and recent evidence about the roles of copper and Cp as a part of the immune response in the etiopathogenesis of multiple diseases and present the usefullness of interpretation of their altered levels.

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