



## A mini-review on importance and role of trace elements in the human organism

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### ARTICLE INFO

#### Article history:

Received 16 May 2020

Received in revised form 1 June 2020

Accepted 2 June 2020

Available online 3 July 2020

#### Keywords:

Trace elements

Health

Disease

Essential

Toxicity

### ABSTRACT

Trace elements are minerals present in living tissues in minute quantities. Some of them are known to be nutritionally essential and the remainder is considered to be nonessential. The body requires certain essential elements and their deficiency or excess may result in serious dysfunction of the body and even death in extreme cases. The low intakes dietary of trace element produce changes in biochemical pathways that can raise the risk of diseases over time. On the other hand, excessive levels, a level higher than needed for biological functions, of these elements can be toxic for the body health. This review evaluates the role and importance of the essential trace element in the human organism. The potential importance of key essential trace elements; Magnesium, Manganese, Iron, Zinc, Copper, Cobalt, Iodine, Selenium, Nickel, Molybdenum and Chromium; and nonessential trace such as Cadmium, Lead, Arsenic and Mercury are discussed.

### 1. Introduction

Trace elements, also called trace metals, are present in small amounts as constituents of all living organisms and despite the minuscule level of their presence, are vital for the growth, development and general well-being of those organisms. It plays a crucial role in many biochemical processes, mainly as components of vitamins and enzymes [1, 2]. Trace elements has been shown that the imbalances in trace elements may negatively affect biological processes and are linked with many fatal diseases [3]. The Interest of trace elements in human physiology began over a century ago with the discovery that a number of compounds in living organisms contained metals not previously considered to be of biological significance [4]. Trace elements are present in every biological process, from the production of energy and hormones, associate with some protein, nerve transmission, cholesterol and blood sugar levels, and muscle contraction to the regulation of pH, digestion, metabolism and others [5]. These elements are part of cells, enzymes, hormones in the body [6]. A few elements donate or accept electrons in redox reactions, which results in generation and utilization of metabolic energy and have an impact on the structural stability and to import certain biological molecules.

Many searches have focused on the relationship of various trace elements levels in blood with biological disorders such as thyroid dysfunction, heart diseases and diabetes, gastrointestinal cancer, breast and lung cancer, sclerosis, neurodegenerative disorders, schizophrenia and Alzheimer's disease and Parkinson's [7-12]. This review article evaluates the role and the importance of essential trace elements in the human organism.

### 2. Trace Elements

#### 2.1. Magnesium

Magnesium (Mg) is an essential element required as a cofactor for more 300 enzyme systems that regulate diverse biochemical reactions in the human organism, including protein synthesis, blood glucose control, nerve and muscle function, and blood pressure regulation [13]. Magnesium may also be considered for adjunct or treatment for depression, as a prevention of renal calculi and cataract formation, and as a therapeutic intervention for many other health-related disorders [14]. Generally, Mg deficiency is due to these factors: low dietary magnesium intake in food and drinking water, excessive losses of magnesium due to certain health conditions, chronic alcoholism and may occur as a result of using certain medications [15].

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