Metal Ions Role in Biological Systems

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Editorial

The role of metal ions in biological systems has been realized for a long time. Some metals are essentials. Others are considered toxic. When it comes to transition metals, the story is not different from that of the main group metals. Some have no known biological effects, such as Scandium in its +2 and +3 oxidation states in its various isotopic forms. Some are hypoallergenic such as Titanium (Ti), while others are essential to all forms of life such as iron and zinc. It appeared that Zinc plays an essential role in 300 enzymes in *biota*.

The aim of this special issue is to make the biologically associated and related scientists pay more and close attention to the essential or the toxic effects of the elements in the first transition metal series of the periodic table. For example, iron ($Fe^{2+/3+}$), by far, is the most important metal ion not only within the first transition series, but also within the entire periodic table. Without iron, there will be no life.

On the other hand, Chromium (III) or (Cr^{3+}) may have a role to play in glucose metabolism as has been seen by Mertz and Vincent. On the other hand, the toxic effect of Cr (VI) or (Cr^{6+}) is undeniable which prompted researches to search for specific Cr^{6+} chelators. Cr^{6+} also is considered to be mutagenic and/or carcinogenic [1-3].

In this special issue of eJBio, the Associate editor is presenting original research articles that deal with the most abundant first series transition ions in humans (Fe^{3+} and Zn^{2+}) and their interactions with one of agonists of one of mammalian nuclear receptors.

The rest of the first transition metal series are: V, Mn, Co, Ni, and Cu. The experts on the biochemistry of these metal ions are welcome to contribute to this special issue. Biologists know the limited role of V in biology. Also, they know the role of Mn in photosynthesis, the role of Co in Vitamin B12, and the role of Ni in urease. We will give a very brief account for one of these remaining metal ions (copper). Copper exists in nature as Cu^{2+} which is the most stable oxidation state; this oxidation state is what always studied by researchers. Cu^{2+} is an essential trace metal ion involved in many metalloproteins including: ceruloplasmin, cytochrome oxidase, superoxide dismutase, dopamine-β-hydroxylase, ascorbate oxidase, lysyl oxidase, and tyrosinase [1-3].

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