

Is Zn redox “innocent”? Redox modulation and signaling by Zn vs Fe and Mn

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We will compare reactivity of some highly charged Zn, Fe and Mn porphyrin and non-porphyrin complexes towards superoxide in chemical, in vitro and in vivo environment, as well as their effects on longevity (studies on *C. Elegans*), cell protection (studies on normal breast cells and multicellular spheroids) and enhancement of cancer radiation therapy (studies on breast cancer cells and multicellular spheroids). Redox activation of superoxide, oxygen, phenyl and quinol functionality by Zn will be presented, demonstrating at molecular level a prooxidative acting of redox inactive Zn. Though a bit paradoxical, but by promoting oxidations Zn can trigger a cellular antioxidative defense, either through induction of SOD catalytic activity of endogenous and exogenous molecules or through upregulation of antioxidants expression. In addition, our newest strategy for applying Zn as adjuvant and/or therapy enhancer to treat COVID-19 will be presented.