"Studies Involving the Pro-Oxidant Activity of Copper in MCF-7 Cells"

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Oxidative stress is defined as a disturbance in the pro-oxidant – antioxidant balance in favor of the former, leading to potential damage in biological systems. The aim of this study is to determine how the pro-oxidant activity of copper(II) ion - an important bioessencial metal - affect the cell cycle, using copper complexes with peptide ligand as a form to carry copper inside the cell. They can mimic a copper imbalance, causing a disturbance in free radicals and reactive species generation inside the cell, generally affecting cell cycle. The cell model studied was the breast tumor MCF-7 treated with copper(II) complexes with the peptides GGH, tetraglycine and triglycine, in the range of 50 to 200µM each complex. In this work we determined the viability of cells in 24 and 48 h after the treatment with copper complexes, by trypan blue exclusion test. Our results showed that only tetraglycine-copper at 50 µM increased the MCF-7 proliferation when compared to control, after 24 h. On the contrary, triglycine-copper and GGH-copper blocked the cell proliferation in 24 h, affecting in a distinct way the cell cycle. Similar studies were conduced with these peptides complexed with zinc(II), in order to compare the effect of peptide isolated. The results sowed a similar effect of the isolated peptide on cell viability, but much less intense when copper complexes were used. It was possible to verify the copper entry in the cell after 24 h by initial studies by atomic absorption spectrometry of copper in the cell lysates, showing that these complexes allowed the copper access in the cell.

Keywords: oxidative stress, copper, cell cycle
(FAPESP, CNPq, CAPES)