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Zinc as Bioindicator: Main Characteristics and the Relation of Zinc and Lung Cancerous

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Editorial

In human health, biological measure used to assess disease risk, health status, or life expectancy has an important role as bioindicator. It is necessary to consider that for a bioindicator to be effective, it must meet some important requirements such as sensitivity and specificity for determination, reproducibility, clinical relevance, ease of measurement. Being able to meet these characteristics makes the bioindicator reliable and allows decisions of relevance to an individual or to public health. Zinc is an essential micronutrient, it is part of more than 200 enzymes, it is involved in numerous biological processes, such as repairing DNA, participating in immune and reproductive function, it also has a relevant role in ossification, such as in lung physiology, among other relevant functions. Its dysregulation is associated with the development and progression of different pathologies ranging from inflammatory conditions, complicating other preexisting pathologies, as well as several types of cancer. Zinc levels in tissues and serum of cancer patients are often altered, which can influence processes such as oxidative stress, DNA repair, immune function, and inflammation.

From the above, we can deduce that Zinc has a potential use in pathologies such as Cancer.

Prevention: Zinc deficiency is associated with an increased risk of some types of cancer. Supplementation may be an important option to prevent some cancers, including colon or oesophageal cancer.

Diagnosis: It can also be a biomarker for the early detection of prostate cancer; this determination could be made in serum of individuals. In this

type of cancer, zinc supplementation could inhibit tumour growth.

Therapy: In breast cancer, zinc and its transporters (such as ZIP6 and ZIP7) are being investigated as therapeutic targets. In pancreatic cancer, zinc can induce cell apoptosis by reactive oxygen species (ROS).

In lung cancer, zinc plays an important role due to its impact on cellular homeostasis and the function of zinc transporters. Studies have identified alterations in zinc levels and in the expression of zinc transporters related to this mineral in patients with lung cancer. Zinc levels in the serum of lung cancer patients are often decreased, which could be related to increased susceptibility to oxidative damage and inflammation. However, zinc levels in malignant tissues may be elevated, suggesting that tumour cells may accumulate zinc to support their growth and survival. Zinc Transporters as ZIP4 is overexpressed in malignant lung cancer tissues, contributing to the accumulation of zinc in tumour cells and promoting cell proliferation and invasion.

In conclusion, zinc plays a dual role in lung cancer, with altered levels that can influence tumour progression. Transporters such as ZIP4 are key in this process and represent potential targets for the development of targeted therapies.

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