

ABSTRACT

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Study Program : Bioinformatics

Title : "The role of metal-based inhibitor to the miR-31 biomarkers of the triple-negative breast cancer (TNBC)"

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About two-thirds of the elements in the periodic table can be categorized as metals. One of the most fundamental characteristics of these elements is their low ionization potential. Therefore, the ionic forms of these elements predominate in the biosphere. Due to the diverse properties of these metal ions, these ions play an important role in various biochemical reactions. For this reason, it is very likely that metal ions also have an important role in RNA biochemistry. According to WHO, breast cancer is one of the main cause of death for women. The triple negative breast cancer (TNBC) is considered as the most difficult breast cancer to be medicated. Most of the current acceptable cancer medication and diagnostics measures are based on the protein world view. However, as transcriptomics studies are getting more advanced, research on non-coding RNA (ncRNA) is being considered as a better and more feasible approach to deal with TNBC. A microRNA called miR-31 has been identified as a potential biomarker for TNBC, as it has influence on the hypermethylation of its host gene, the LOC554202 promoter-associated CpG island. Moreover, the miR-31 also influences the suppressor of the Wnt signaling antagonist to expand the breast tumorigenesis. Research on the complementary siRNA (silencing RNA) of the miR-31 could therefore be useful as a potential treatment for TNBC. Considering the important role of metal ions in RNA biochemistry, future studies on miR-31 inhibitors should be focused on metal-based inhibitors and the roles and functions of the metal ions in these inhibitors for the miR-31 breast cancer biomarker.