# IMMUNOHISTOCHEMISTRY EXPRESSION OF KLOTHO IN BONE MARROW BIOPSIES FROM NORMAL, MGUS, AND PLASMA CELL MYELOMA

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Klotho is an anti-aging gene, which has been shown to inhibit the insulin and insulin-like growth factor 1 (IGF-1) pathways in mice hepatocytes and myocytes. Immunochemistry analysis of Klotho expression in breast tissue arrays revealed high expression in normal breast, but very low expression in breast cancer. In this study we examined eight normal bone marrow, eight MGUS (monoclonal gammopathy of undetermined significance), and forty-two cases of plasma cell myeloma by immunohistochemistry with the Klotho antibody.

The immunostaining of the Klotho antibody was localized in the cytoplasm and as punctate granular staining of myeloma cells in the marrow. In the accompanying bone marrow clots, Klotho was seen as strong punctate granules on myeloma cells and not on other peripheral white blood cells. There was no staining of plasma cells in the eight normal bone marrow cases. Slight cytoplasmic staining was seen in myeloid series of cells in the normal bone marrow and in megakaryocytes. In the eight MGUS cases, there was very minimal cytoplasmic staining in a few of the myeloma cells. Minimal staining was seen in the myeloid series of cells in the marrow in these cases. Klotho was highly expressed in the myeloma cases and no staining in the normal and MGUS cases.

In conclusion, Klotho was highly expressed in patients with myeloma in myelomas cells in the bone marrow.

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