ONCOblot Reports

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Blood Cell Cancers are Detected but not Identified as to Type or Subtype by the ONCOblot® Tissue of Origin Cancer Test

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MorNuCo, Inc. continues its monthly report for participating physicians and health professionals in order to answer common questions relating to the ONCOblot® Tissue of Origin (Cancer) Test. In the current issue, the detection of blood cell cancers by the ONCOblot® Tissue of Origin (Cancer) Test is discussed. Blood cells share a common progenitor, hematopoietic stem cells. Thus, different types of blood cancers produce similar ENOX2 transcript variants, which have yet to be differentiated.

ENOX2 proteins are associated with the cancer cell surface, where they contribute to the uncontrolled growth of cancer cells. Cancers of different tissues of origin produce specific ENOX2 protein transcript variants, which are detected and differentiated by the ONCOblot® Tissue of Origin (Cancer) Test.

Blood is a highly specialized fluid form of connective tissue (1). Cellular elements of the blood are derived from a common cell, the multipotential hematopoietic stem cell (hemocytoblast) located in the bone marrow. Thus red cells, platelets and white cells are produced through the process of hematopoiesis within this single tissue. Blood cancer involves combined defects in cellular maturation and differentiation, mostly of white cells, preventing normal formation or function.

Blood cancers are classified into three main types according to the function of the cells affected; leukemia, myeloma and lymphoma. Within each blood cancer type there are several subtypes that are classified based on the actual onset of the disease.

Leukemia results from the malignant transformation of an early hematopoietic stem cell, together with the expansion and accumulation of malignant white cells in the bone marrow which interferes with the production of red cells and platelets in blood (2). Lymphoma cells are malignant lymphocytes, another type of white cell which may arise from T cells, B cells or from different stages of lymphocyte development (2). Myeloma cells are malignant plasma cells (B-cells), a type of white cell that is responsible for the production and secretion of monoclonal immunoglobulin or M protein (3).

Confirmed cases of different types and subtypes of blood cancers in our database were assayed by the ONCOblot® Tissue of Origin (Cancer) Test and are shown in Table 1. The molecular weights and isoelectric

points of the ENOX2 proteins detected, while not identical, fall into a single category or common range of values for blood cell cancers (Figure 1).

Table 1 Blood cancers detected by the ONCOblot® Tissue of Origin (Cancer) Test.

Type	Subtype
Lymphomas	Hodgkin and non-Hodgkin: Follicular, diffuse large cell and cutaneous.
Leukemias	Chronic lymphocytic leukemia (CLL), chronic myelogenous leukemia (CML), acute myelogenous leukemia (AML) and B-cell (ALL).
Myelomas	Myeloma/Multiple Myeloma

For leukemias and lymphomas, the molecular weights of the detected ENOX2 proteins were primarily distributed over a very narrow range of 43 to 45 kDa, which corresponds to the margin of error in their determination by the ONCOblot® Tissue of Origin (Cancer) Test. Isoelectric points varied more widely, but with the majority falling between pH 3.7 and 3.9. Corresponding values for myelomas fell outside (both higher and lower) these ranges with non-overlapping values for myeloma and multiple myeloma.

Summary

The ONCOblot® test detects ENOX2 protein transcript variants produced by cancerous cells, including when the tissue of cancer origin is blood. Different blood cancers exhibit a common range of molecular mass (38-48 kDa) and isoelectric point (pH 3.6-4.5).

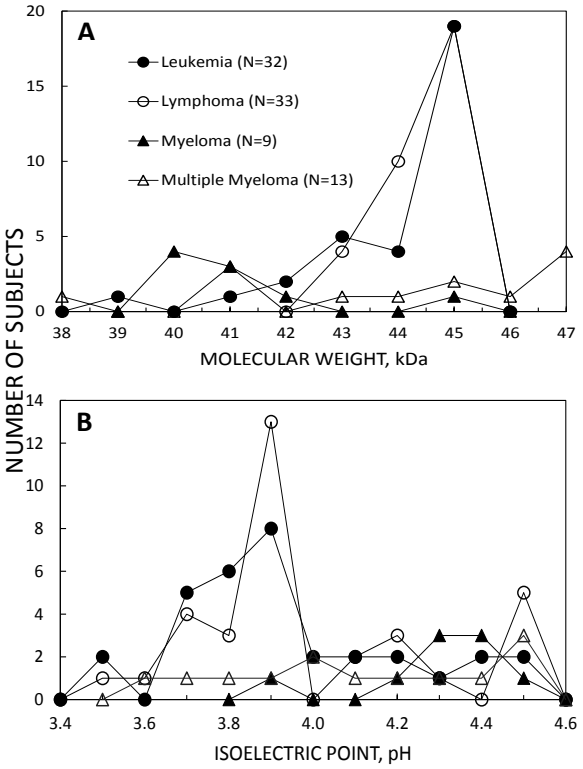

Figure 1 Distribution of ENOX2 molecular weight (A) and isoelectric point (B) determined for blood cancers.

ENOX2 protein transcript variants produced by different types and subtypes of blood cancers may not be identical, but cannot be consistently differentiated due to the overlapping molecular weights and isoelectric points of the ENOX2 proteins produced by each type of blood cancer.

References

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