Applied molecular biology

Health & Medicine

LYMPHOMA DIAGNOSTICS TECHNIQUES al Affiliation) Problem of Interest

Lymphoma diagnostics. Many people die of the disease called non-Hodgkin's lymphomas. The most common type of non-Hodgkin's lymphomas (NHL), out of the many subtypes, is the diffuse large B-cell lymphoma (DLBCL). This death rate can be reduced by employing various methods stated below.

Why the Problem Exists

It is very difficult to categorize prognostic ally on morphological or clinical grounds the condition of NHL subtype DLBCL.

With the complexity of the classification system of the NHL, it is known that the NHL categories have multiple disease subtypes each with separate molecular defects and clinical outcomes.

An example is where, 35-40% of patients diagnosed with DLBCL is able to be cured using chemotherapy whereas 60-65% die of the disease. (Airley, 2009)

Attempts to distinguish patients likely to respond to chemotherapy from those unlikely have been unsuccessful.

The DLBCL tumors are also not able to be distinguished using classical histopathology and the available molecular markers. (Younes & Coiffier, 2013)

Envisage of the Prospective Solution

Recent studies on non-Hodgkin's lymphomas show some diagnostic advances made possible by HD (High Density) DNA microarrays. (Berrar, 2003)

Researchers currently have tried to approach the problems by using HD cDNA microarrays to profile gene expression in DLBCL. CDNA Is a platform where Polymerase chain reaction products are separately and placed on the

array surface using a robotic arrayed.

The researchers identified genes responsible for classifying DLBCL specimens into separate subclasses. One of the subclasses was germinal-center B-cell-like DLBCL which showed an expression pattern the same as the mature germinal-center B-cells and portended a more favorable prognosis with a 60% five-year survival rate. Besides that, two other DLBCL subclasses, these are, type-3 DLBCL and activated B-cell-like DLBCL, presented much less favorable prognoses with a 35% five-year survival rate. From all these and the researches, it may be possible to determine the patients that might benefit from more aggressive therapies such as chemotherapy regimens or bone marrow transplants when DLBCL is diagnosed. HD DNA microarray studies have highlighted molecular pathways that are important in cancer subclasses. Example, researchers have observed that several genes in the activated B-cell subclass of DLBCL were downstream targets of the NFkB transcription factor. They proved that NFkB activity is higher in this DLBCL subtype thereby suggesting that drugs targeting the NFkB may be effective in the treatment of these tumors. (Cain, 2011)

Gene expression profiling of tumor specimens may be useful in the pre-selection of patients who may benefit from drug treatment. It can also be used in examining gene expression profiles of cancers following chemotherapy so as to determine whether the tumors are responding to treatment. In this method, detailed patient-specific molecular information would be used to predict an effective therapy. (Schwab, 2009)

Problems Associated With Proposed Solutions

This method is not effective in very remote areas with limited facilities.

Overcoming the Problem in a Systematic Way

Equipping the health centers with the necessary equipment that can be used to improve the human health status

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