Array CGH Defines Diagnosis as AML with a non-M3 Subtype

**Clinical Overview**

The 72 year old patient was referred to GenPath with a suspected diagnosis of acute lymphoblastic leukemia. Physician ordered testing for diagnosis included cytogenetics, FISH, and PCR to detect specific gene rearrangements in BCR/ABL1 and PML-RARA. The only abnormality detected prior to Array CGH testing was the chromosome translocation t(15;17)(q22;q21.2) between the long arms of chromosomes 15 and 17, indicative of Acute Promyelocytic Leukemia (APL, AML-M3).

**GenArray Clinical Insight**

Our Array CGH technology delineated the specific copy losses on chromosomes 15q and 17q which were found NOT to have involved the PML or RARA locus. The results indicate that the translocation (15;17) observed by cytogenetics was likely to be an unbalanced rearrangement and thus **not AML-M3**, changing the prognosis from favorable to unfavorable. The high resolution of Array CGH clarified the discordant abnormal cytogenetic findings and negative FISH and PCR results.

**Patient Information**

- **Age:** 72
- **Gender:** Male
- **Specimen Source:** Bone Marrow
- **Clinical Information:** Suspected ALL.

**Diagnostic Summary**

- **Cytogenetic** chromosome analysis identified the translocation t(15;17)(q22;q21.2) between the long arms of chromosomes 15 and 17 observed in eight metaphases.

- **FISH** probes for 5q-, 7q-, +8, 20q12, t(8;21), inv(16), t(16q23), BCR/ABL t(9;22), AML1/ETO t(8;21), PML/RARA t(15;17) were all negative.

- **PCR** for rearrangements in BCR/ABL and PML/RARA were both negative.

- **GenArray** uniquely identified singly copy losses of genetic material in breakpoints 15q22.2 and 17q11.2, both above the PML and RARA genes, and therefore not producing the hallmark balanced translocation found in AML-M3.

**GenArray Implications:**

The patient’s diagnosis has been changed from suspected APL (AML-M3) to one of AML non-M3; this has an unfavorable prognosis and significant treatment implications. AML **non-M3** is normally treated with an aggressive chemotherapy regimen consisting of a cytarabine and anthracycline vs. a retinoic acid based regimen for APL. Anthracyclines have known cardiotoxic side effects and thus are given only in certain clinical situations.

See back of page for the high resolution picture produced by the Array showing the areas of chromosome deletion in this AML case.
GenArray™ AML Case study

GenArray Inside Look:

Location of actual chromosome loss in comparison to PML and RARA genetic regions

15

17

Actual chromosome loss

RARA gene location

PML gene location

Actual chromosome loss