Poster Abstract

BRN Symposium 2011
Bethesda, USA, March 28-29, 2011

PAXgene Tissue: A New Tissue Fixation Technology for Simultaneous Preservation of Morphology and Nucleic Acids

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Introduction: PAXgene Tissue (PAXgene) is a new, formalin-free fixation technology developed for simultaneous preservation of morphology and biomolecules in tissue samples. PAXgene-fixed, paraffin-embedded (PFPE) tissue is suitable for conventional histochemical and immunohistochemical staining as well as for extraction of high quality nucleic acids.
Material and Methods: Cases of human lung, breast and colorectal cancer were divided and fixed in formalin, PAXgene, or snap frozen in liquid nitrogen (LN2). PAXgene-fixed, stabilised specimens were stored for up to four days at room temperature prior to processing. Formalin-fixed, paraffin-embedded (FFPE) and PFPE tissue morphologies were compared using H&E stain. RNA, miRNA and DNA were isolated from FFPE, PFPE and LN2 tissue. RNA expression was analysed in 96-well RT-qPCR arrays with pre-designed assays, and miRNA expression profiling was performed with single Sybr-green or primer/probe based assays. DNA was analysed by agarose gel electrophoresis, long-range, and multiplex PCR.
Results: Morphology of PFPE samples was similar to or indistinguishable from FFPE tissue. A high correlation of both RNA and miRNA gene expression results was observed between PFPE and LN2 samples. For all PCR assays, Ct values were within +/- 2 Ct. In contrast, poor correlation was observed between RNA from FFPE compared to RNA from LN2 with differences of up to 10 Cts. Correlation of FFPE to LN2 was higher in the case of miRNA but was still not as high as that of miRNA from PFPE. High molecular weight DNA which performed well in PCR could be isolated from LN2 and PFPE tissue, but DNA from FFPE failed in long-range PCR and showed biased or no amplification in multiplexed PCR.
Conclusion: The PAXgene Tissue fixation technology preserves morphology and nucleic acids in tissue samples. It enables morphological and multimodal biomarker testing with one sample.