Introduction

PreAnalytiX has developed a system for preservation of histomorphology and nucleic acids in paraffin embedded tissue samples. The system is comprised of a collection container for formalin-free fixation and stabilization of tissue specimens and specialized purification kits for isolation of DNA, RNA, or microRNA directly from tissues fixed in PAXgene TissueFix, paraffin embedded tissue samples.

In this case study, a tissue specimen of human infiltrating ductal carcinoma (IDC) of the breast was divided into three parts after resection and 1) fixed in neutral buffered formalin (NBF), 2) fixed and stabilized in the PAXgene TissueContainer, or 3) snap frozen in liquid nitrogen (LN2). Paraffin embedded tumor samples were compared for preservation of histomorphology, expression of ERα, PR, and HER2. RNA was isolated from paraffin embedded and snap frozen samples and compared for integrity and preservation of the gene expression profile.

Materials and Methods

Tissue specimens

Histological type: Infiltrating ductal carcinoma of the breast
Histological grade: Moderately differentiated

Fixation

NBF
PAXgene TissueFix

Isolation

PAXgene Tissue Fix:
PAXgene Tissue Container: 1.5h @ R.T.

Primer/probe assays

TaqMan® Array Gene Signature 96-Well Plate: human molecular mechanism of cancer

NCBI accession numbers

10.000 genes

Study Design

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The PAXgene Tissue System preserves morphology and gene expression profile in paraffin embedded breast cancer tissue samples. Histomorphology is preserved similarly to that seen in fresh frozen tissue, while the gene expression profile shows a high correlation to snap frozen tissue.

In conclusion, the test results yielded the following comparison between PFPE and FFPE breast tumor (IDC) tissue:

• H&E stained sections of PFPE were similar to, or indistinguishable from, FFPE tissue.
• Immunohistochemical staining of HER2, ERα, and PR gave comparable staining intensities in PFPE and FFPE samples.
• RNA from LN2 snap frozen and PFPE samples were of high integrity with average RIN values of 8.5 and 8.6 respectively, compared to low RIN value of 2.2 from FFPE.
• Gene expression analysis of 95 genes in real time RT-PCR showed a high correlation of CT (FFPE or PFPE) -10 CT (snap frozen). A: Scatterplot of ∆CT PFPE vs FFPE.

Conclusions

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