

Poster Abstract

23rd European Congress of Pathology
Helsinki, Finland, August 27 - September 01, 2011

A New Technology for Simultaneous Preservation of Biomolecules and Morphology in Tissues

C. Viertler¹, D. Grözl², K. Kashofer¹, S. Gündisch³, P. Riegman⁴, R. Winther⁵, R. Wyrich⁶, M. Kruhoffer⁷, K.-F. Becker³, U. Oelmüller⁶, K. Zatloukal¹

¹Institute of Pathology, Medical University of Graz, Austria

²PreAnalytiX GmbH, Hombrechtikon, Switzerland, c/o QIAGEN GmbH, Hilden, Germany

³Institute of Pathology, Technical University Munich, Germany

⁴Department of Pathology, Josephine Nefkens Institute, Rotterdam, The Netherlands

⁵Dako Denmark A/S, Glostrup, Denmark

⁶QIAGEN GmbH, Hilden, Germany

⁷AROS Applied Biotechnology A/S, Aarhus, Denmark

Background: Upcoming molecular diagnostics and emerging omics-technologies increased the need for a new tissue preservation technique that enables combined histopathological diagnostics and molecular analyses from one tissue sample. Therefore, we tested a novel stabilisation technology (PAXgene Tissue System), developed using a high-throughput screening approach.

Methods: Corresponding samples from different human (non-)malignant tissues were either snap-frozen, fixed in buffered formaldehyde or with PAXgene Tissue. In a comparative study morphology, antigenicity and different biomolecules were investigated with a focus on nucleic acids preservation.

Results: PAXgene-fixed and paraffin-embedded (PFPE) samples showed outstanding RNA preservation and strong correlation of multiple mRNA and microRNA profiles with snap-frozen samples as revealed by qPCR and microarray analysis. DNA isolated from PFPE was of similar high molecular mass and well suited for long-range and multiplex PCR as well as for different sequencing techniques. Proteins showed the same electrophoretic mobility compared to cryo-preserved samples and good preservation of phosphorylation levels.

Conclusions: The versatility of the PAXgene Tissue System opens new opportunities for combined morphological and molecular analyses in a series of applications scenarios e.g. clinical trials, biomarker discovery or molecular analyses of lesions where a collection of snap-frozen material is impossible for logistic, medical or ethical reasons.