

The Importance of Tissue Quality for Personalized Medicine

Overview

Quality control for samples used in proteomics, metabolomics, transcriptomics, or targeted analytical applications are of outstanding importance. The lack of standardized, high-quality, and clinically annotated human biospecimens poses a significant roadblock to cancer drug and biomarker development. You can find the published recommendations [here](#).

With more than 20 years of experience Indivumed Services scientists have conducted extensive research and authored many publications highlighting the importance of pre-analytical conditions of biospecimens (surgical conditions for tissue processing) and its effect on protein and gene expression. With extremely short ischemia times and standardized sample preparation, Indivumed Services ensure the best quality for your research.

Research Data

Success in personalized medicine depends on standardized tissue and data processing.

> [Oncotarget](#). 2014 Nov 30;5(22):11017-28. doi: 10.18632/oncotarget.2669.

Surgical procedures and postsurgical tissue processing significantly affect expression of genes and EGFR-pathway proteins in colorectal cancer tissue

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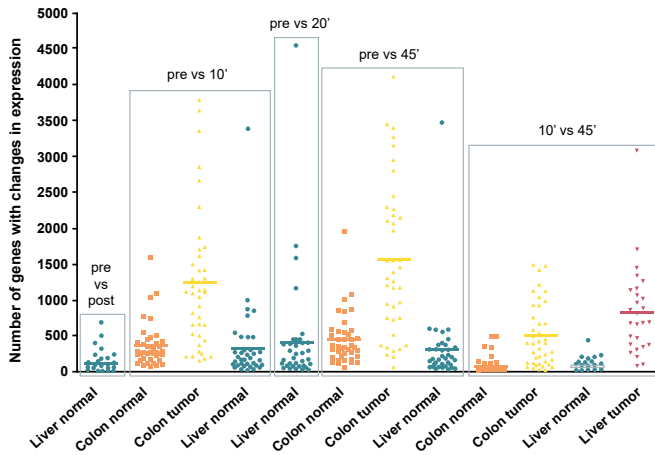
The study David et al., 2014: "Surgical procedures and postsurgical tissue processing [...]" was conducted to gain a better understanding of the effects that warm and cold ischemia have on the molecular composition of a tissue specimen.



The variability of gene and protein expression changes between patients, tissue type, surgery, and tissue processing times:

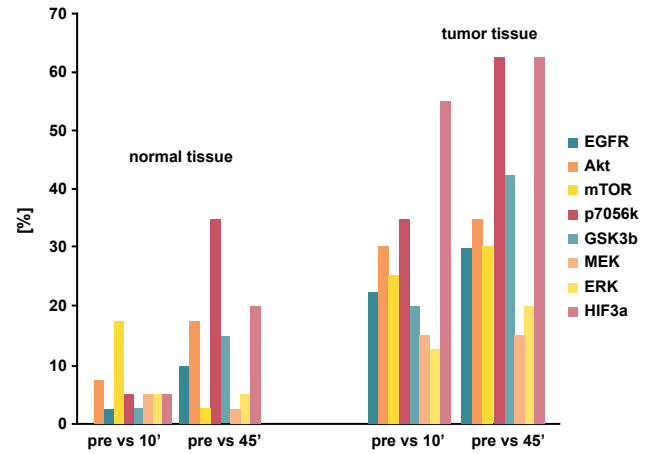
Gene Expression
presurgery vs. postsurgery

Change ≥ 2 -fold during surgery and postsurgical processing time



Protein Expression
presurgery vs. postsurgery

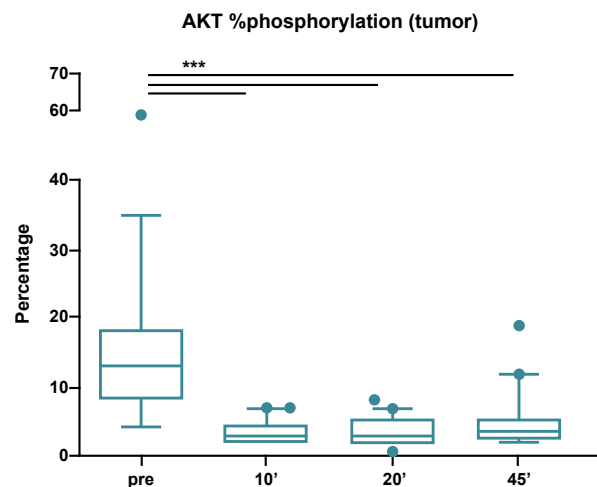
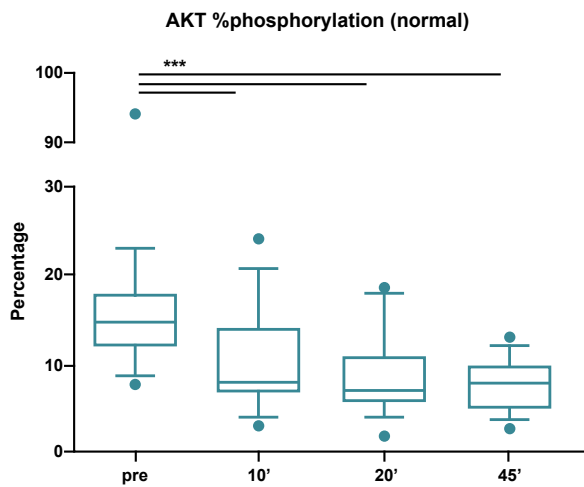
Change ≥ 2 -fold during surgery and postsurgical processing time



Expression change $>15\%$ of genes and 60% of selected proteins due to ischemia

Percentage of protein phosphorylation of AKT in normal and tumor colon tissue at four timepoints of tissue collection:

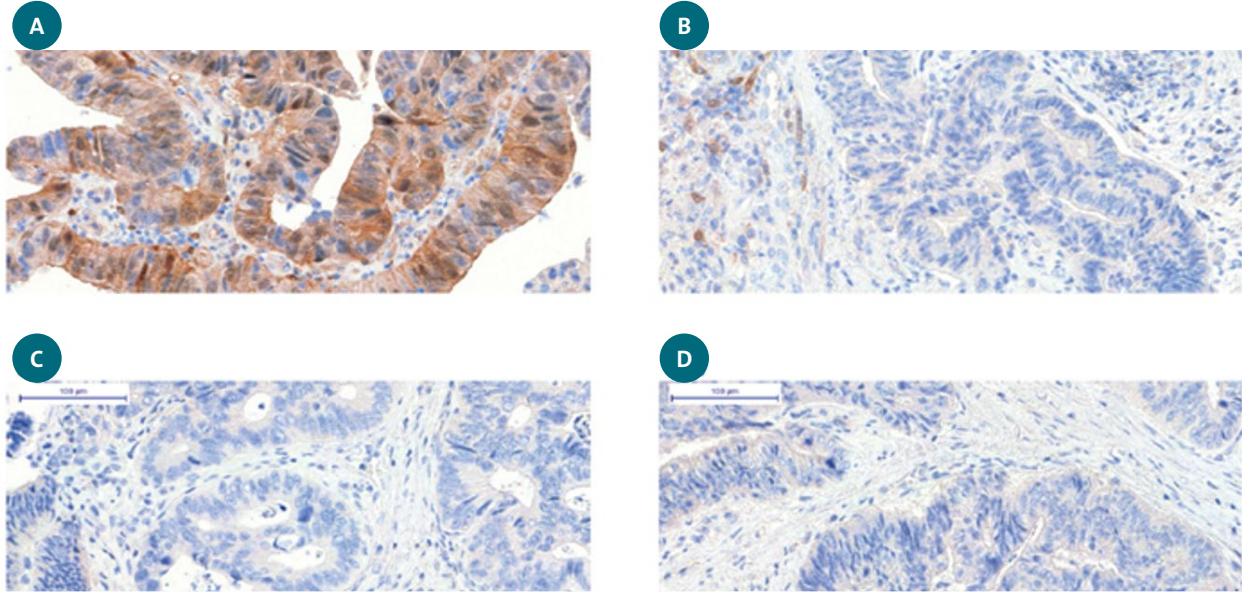
- pre, before hepatic pedicle clamping
- 10', 10 minutes after resection
- 20', 20 minutes after resection
- 45', 45 minutes after resection



Protein phosphorylation decreased significantly with warm and cold ischemia in normal colon and CRC tumor tissue.

Representative immunohistochemistry for pAKT (brown staining) on formalin-fixed colon cancer tissue from one patient taken at four timepoints:

- (A) biopsy presurgery (Colonoscopy)
- (B) tissue fixed 10 minutes after resection
- (C) tissue fixed 20 minutes after resection
- (D) tissue fixed 45 minutes after resection.



The decrease in protein phosphorylation of EGFR-pathway proteins was mostly associated with lower staining intensity in immunohistochemistry.

About Indivumed Services

Indivumed Services, a Crown Bioscience Company, is a global contract research organization (CRO) that offers an industry-leading oncology biobank and a range of service platforms to advance oncology and immuno-oncology drug discovery and development.

Holding a unique biobank of clinical specimens, unrivalled in quality and associated clinical history, which currently totals almost one million patient samples, the company partners with extensive clinical network of more than 60 entities in the United States, Europe, and Asia providing direct and controlled access to relevant surgical biospecimens and blood samples.

Further known for their enhanced immunohistochemistry and spatial transcriptomics, Indivumed Services' platforms complement a range of established Crown Bioscience capabilities supporting biomarker discovery.

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