

# Optimised biobanking procedures for preservation of RNA in tissue: comparison of fresh-freezing and RNAlater®-fixation methods

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## Introduction

Personalized treatment, supported by biomarkers, would be a major breakthrough to improve survival of cancer patients. RNA molecules are potentially important biomarkers. The Danish CancerBiobank provides an infrastructure for handling and storage of biological material, including RNA, from Danish cancer patients. The aim of this study is to investigate the effects of handling-time and fresh-freezing versus RNAlater® fixation on RNA degradation in solid tissue samples.

## Material and Methods

We evaluated RNA quality in operational tissue from patients with a pelvic mass. Samples were either fresh-frozen or fixated in RNAlater®, at 8 different time-points after surgery. Integrity was measured using a bioanalyzer, and the amount and quality was further investigated by qPCR measuring the expression of housekeeping genes B2M and HPRT1.

## Results

Our findings show that tissue RNA is stable up to at least 180 min. after surgery. The quality of the RNA was not significantly higher for RNA handled immediately compared to 180 min after surgery. Likewise, patient RNA was stable after both fresh freezing and RNAlater® fixation, both methods were equally effective.

## Discussion and conclusion

Effective but careful RNA handling and storage may be a necessary step towards personalized treatment of cancer. Strict rules from the cancerbiobank about tissue handling time have been a challenge in a clinical setting. Our data suggest that RNA in pelvic mass samples is more stable than expected. However, RNA stability should be confirmed for each new biomarker identified.

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