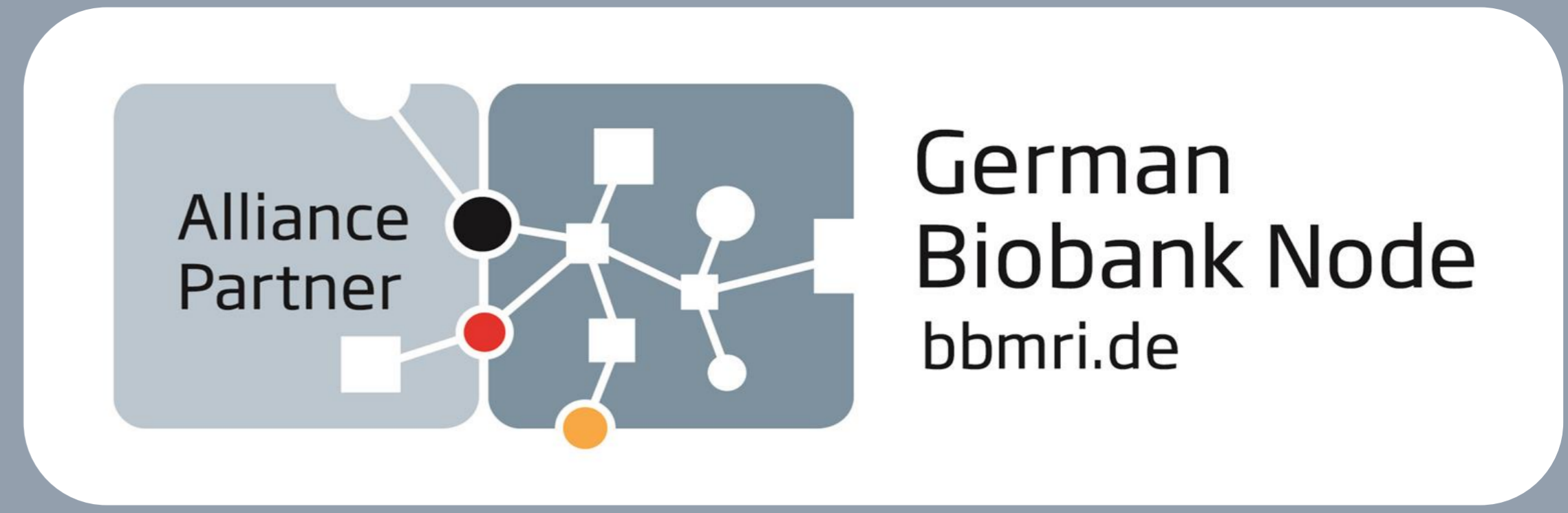


# GBA TISSUE RING TRIAL: THE SECOND ROUND WITH AN EXTENDED CONCEPT



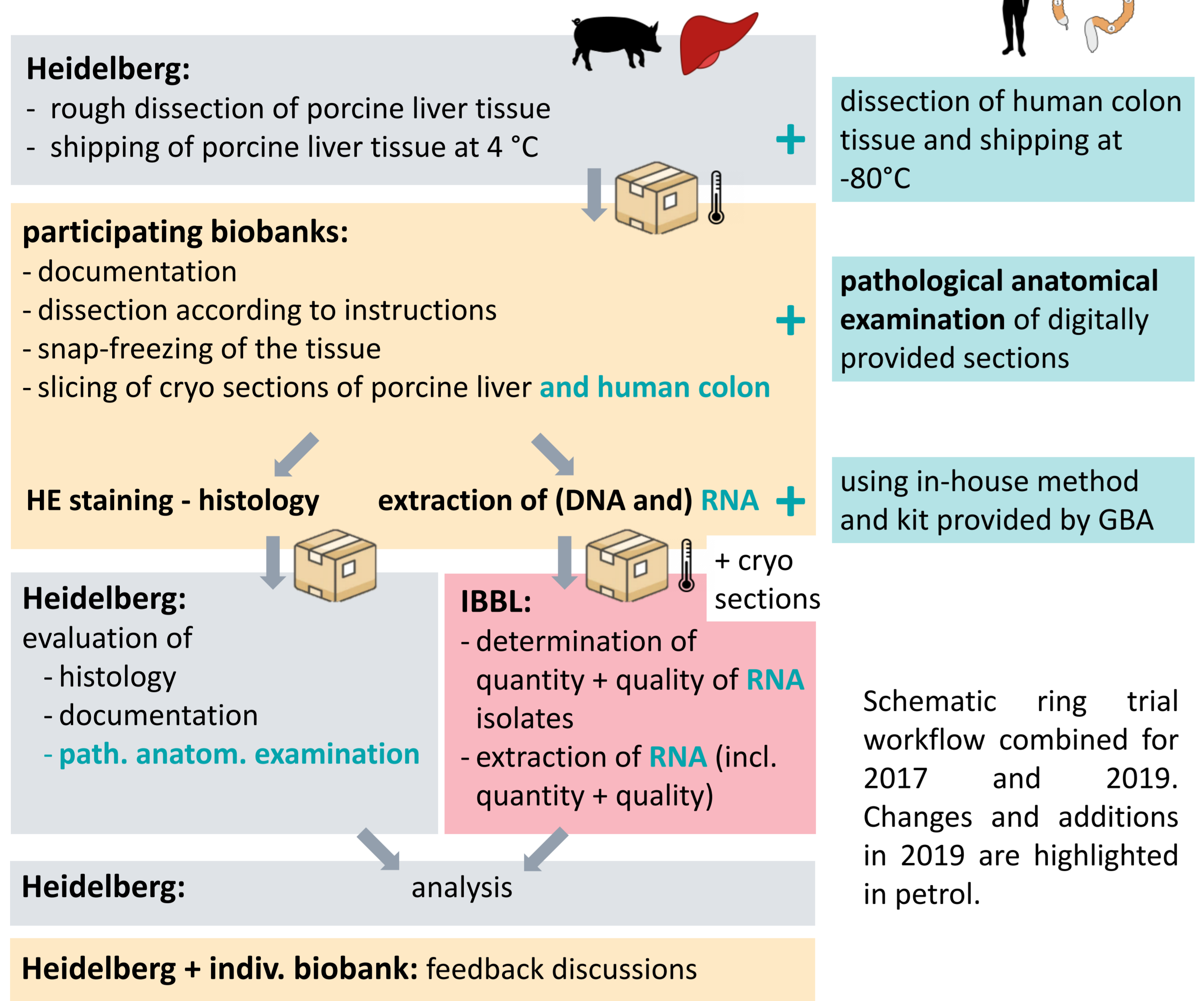
## ABSTRACT

Pre-analytical tissue-related processes such as transportation, tissue handling and storage potentially have a great impact on sample quality. A useful tool to assess this impact and to identify associated critical conditions is the accomplishment of interlaboratory comparisons. The collected data and derived conclusions are valuable resources that allow a harmonization and a refinement of tissue-related processes to ensure consistent high sample quality.

In order to assess the *status-quo* of tissue-related processes within biobanks, GBA established in cooperation with the BioMaterialBank Heidelberg (BMBH) a ring trial program and successfully conducted the first round in 2017. Based on the promising results we extended the concept in the course of the second round performed in June 2019.

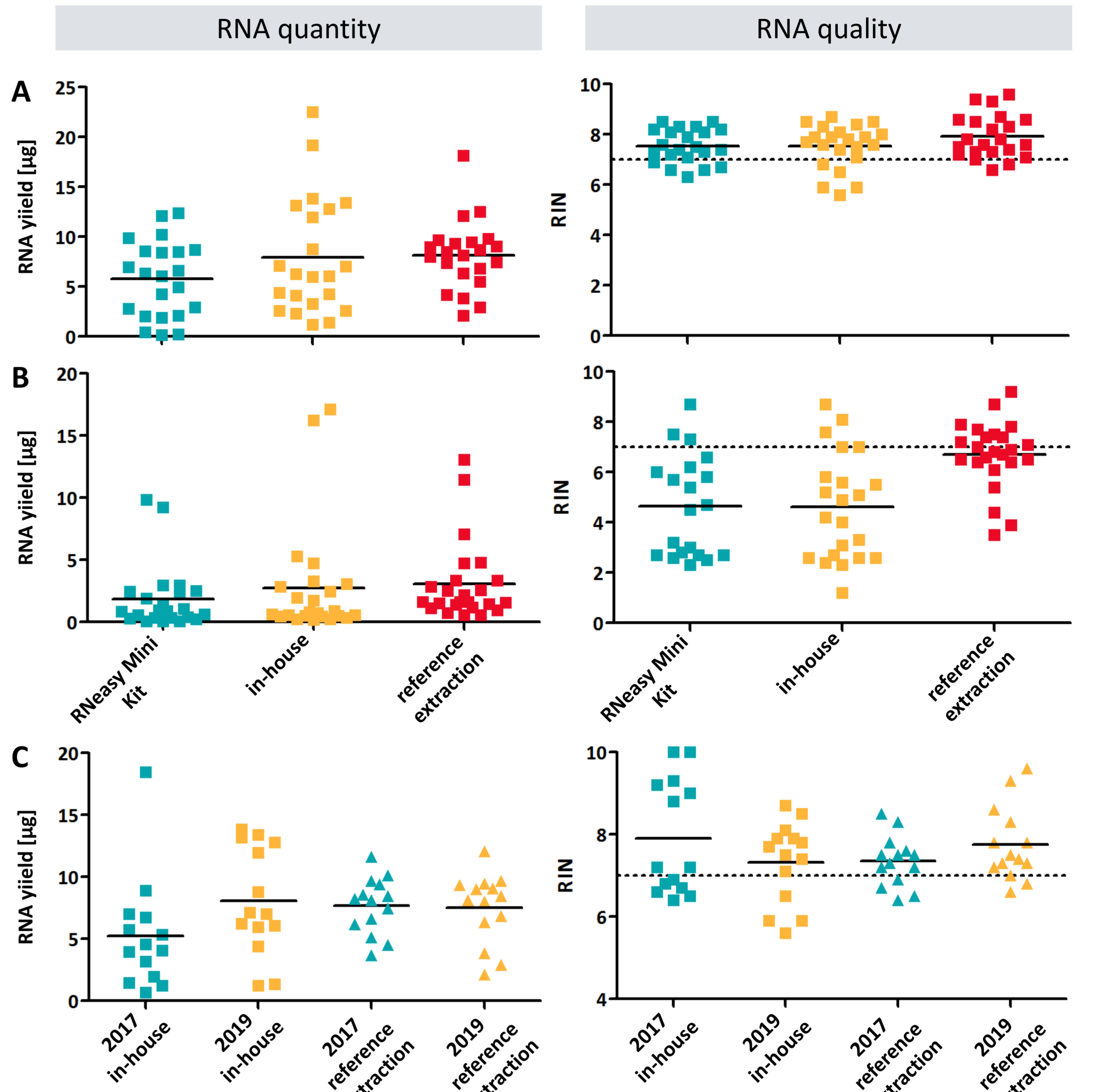
After analysis, measures of individual improvement and harmonization will be derived based on the results of both, the first and the second round.

## WORKFLOW



## RNA EXTRACTION

RNA from porcine liver tissue (A) and human colon (B) tissue were extracted according to a kit provided by GBA (RNeasy Mini Kit) and the local standard method (in-house). Upon determination of RNA quantity and quality cryo sections were sent to a reference laboratory and a reference extraction was performed. To assess both, a potential improvement of performance and an impact of storage on sample quality, the result of both rounds were compared (C).



The in-house extraction methods are as efficient as the reference extraction.

The participants increased the RNA yield in 2019 compared to 2017.

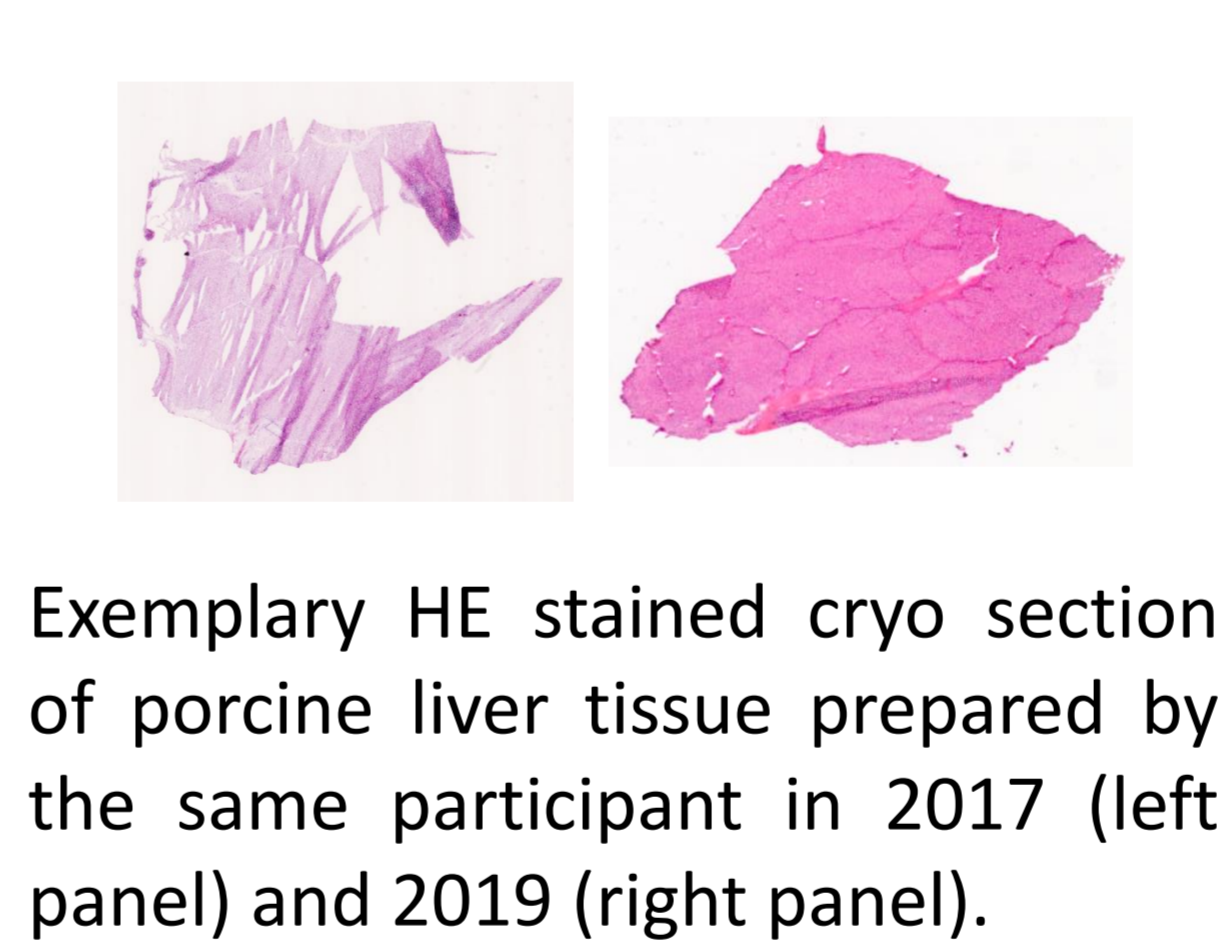
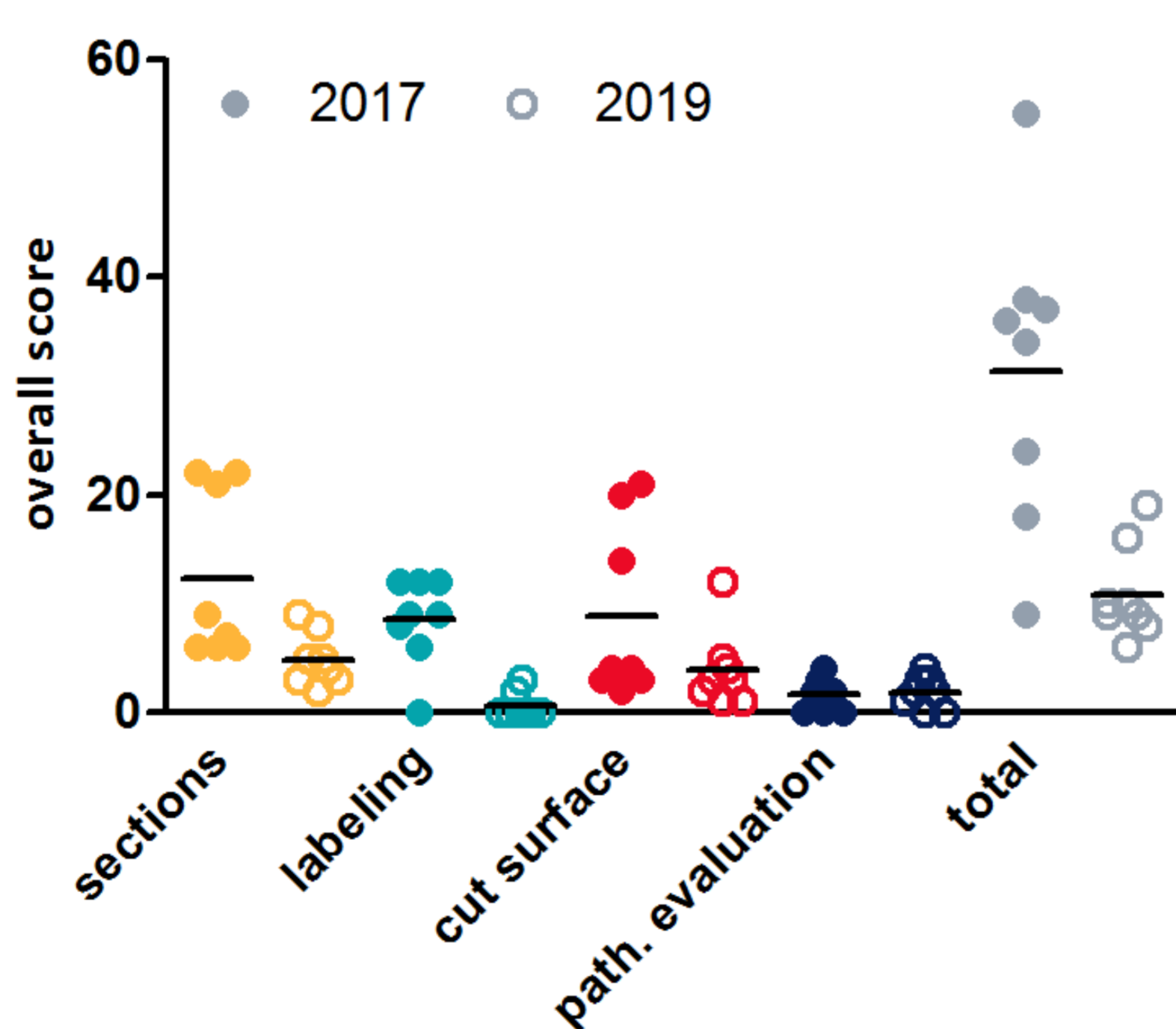
Extraction methods conducted by participants deliver RNA of lower quality compared to the reference extraction.

The assessed storage time did not have an influence on RNA quantity and quality.

## HISTOLOGY

Technical, as well as pathological aspects were evaluated according to a scoring system.

| Score | Description             |
|-------|-------------------------|
| 0     | very good/ non-existent |
| 1     | good/ little            |
| 2     | moderate                |
| 3     | poor/ severe            |



All participants improved their performance in comparison to 2017.

## CONCLUSION

The results of the second round demonstrate an improvement of performance for each participant for both, histology and RNA extraction. Furthermore, we conclude that the storage time did not (yet) have an impact on sample quality. The analysis of the pathological anatomical examination provided satisfying and consistent results.



### Improvement potential and outlook:

A „best practice“ HE staining protocol will be developed, which will be verified in future ring trials.

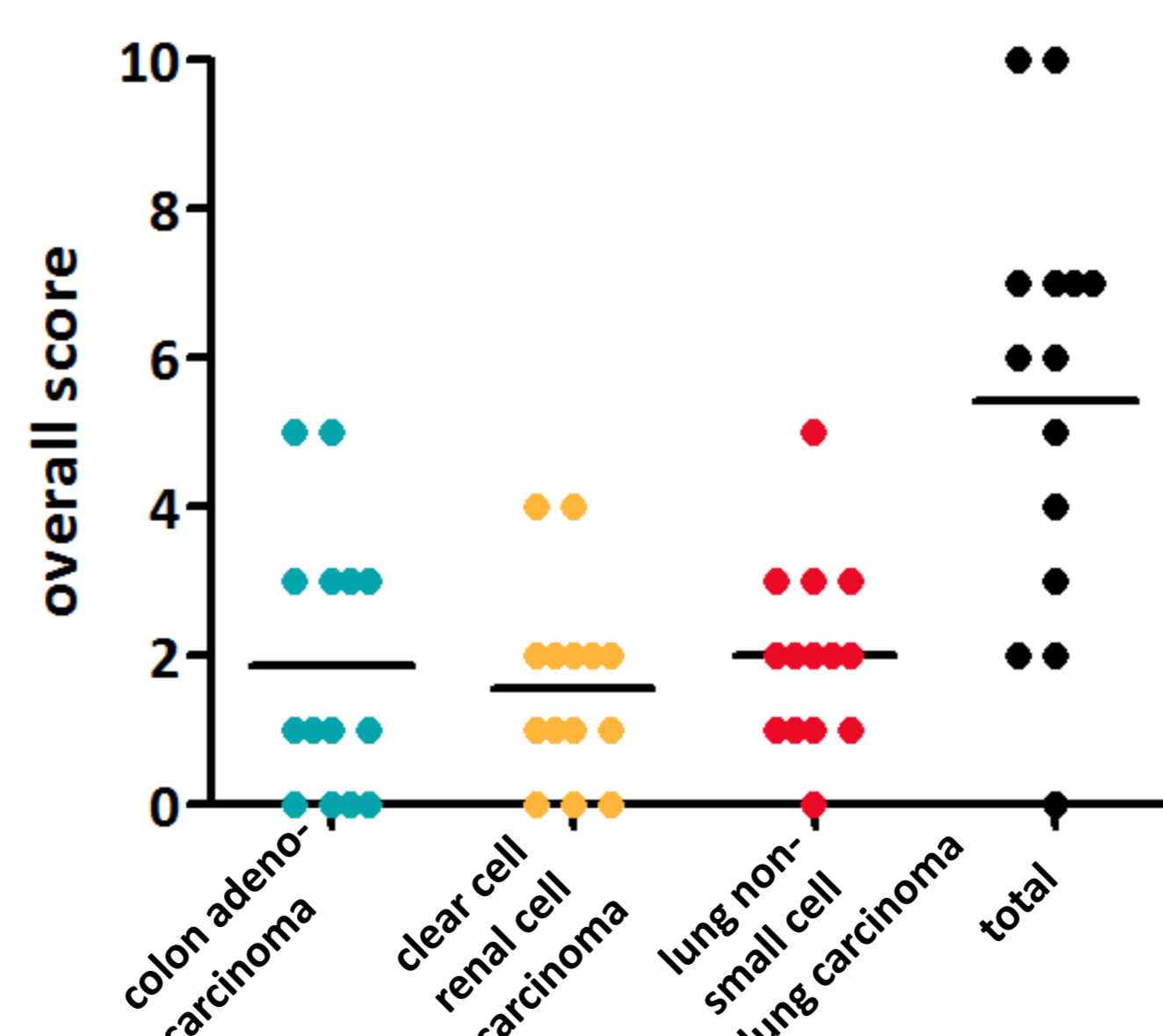
While the in-house methods tested here provide equal amounts of RNA compared to the reference extraction, the RNA quality was notably reduced. To improve RNA quality, the optimisation of the homogenisation method will be assessed.

## PATHOLOGICAL ANATOMICAL EXAMINATION

The evaluation was based on the mean and standard deviation calculated from the values submitted by all participants and conducted according to a scoring system.

evaluated parameter: tumor of total tissue [%], vital [%], devitalized [%], stroma [%]

| deviation from mean | score |
|---------------------|-------|
| < 1x SD             | 0     |
| ≤ 2x SD             | 1     |
| > 2x SD             | 2     |
| > 3x SD             | 3     |



The results of the individual participants are in line with the average of all participants.