

## Cancer Research: Correlation of sample morphology and genotype

### Extract 100% pure cancer tissue for mutation analysis

DNA mutations lead to abnormal proteins or missing functional proteins, which can cause cells to multiply uncontrollably and become cancerous. To find and understand the underlying mutation for a specific cancer type, extraction of pure tumour material is extremely important. This is challenging especially if little amounts of cancerous tissue is available like small metastasis.

Laser Microdissection allows to purely extract cancerous tissue without contamination with healthy cells. Thus DNA sequencing will always lead to valid and reproducible results helping to identify the cancer causing DNA mutation easily as no masking by contaminating healthy cells can occur.



#### Typical fields of research

- Pathology research
- Neuroscience
- Pharmaceutical research
- Plant research
- Epigenetics research

#### References

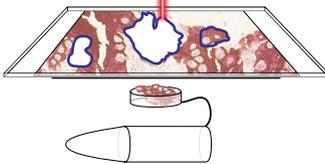
- Ardighieri et al., Virchows Arch., 2016, 469 (1)
- Barrow et al., Int J Cancer, 2015, 137 (3)
- Chatziandreu et al., PLoS One, 2015, 10 (7)
- Mishima et al., Breast Cancer Res Treat. 2015, 152 (2):305-12

# Mutation analysis workflow with pure cancer material



## Sample preparation

Cryo-sectioning with a cryostat and preparation of sections on special LMD slide. Alternatively you can also use FFPE material and a microtome.



Collect pure material via gravity:  
LMD by Leica Microsystems



## Fixation and staining

Fixation and staining of tissue for microscopy and LMD application. Can be automated with a stainer.



## Visualization and ROI definition

Automatic generation of sample overview. The regions of interest (ROI), can be identified and marked automatically or easily manual.



## Laser microdissection

The ROIs will be automatically dissected and collected via gravity into standard, cost-effective consumables such as PCR tubes or 8-strip tubes (e.g. Leica LMD7).



## Extraction of DNA

The preparation for downstream analysis can be obtained by commercially available DNA extraction kits (e.g. QIAGEN).



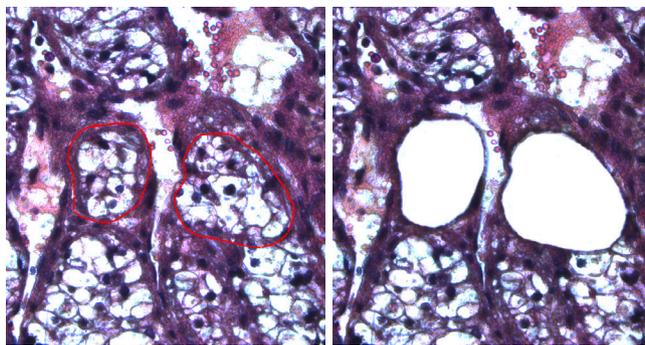
## Mutation analysis

Mutation analysis is done via next generation sequencing (NGS). Other technologies like Pyrosequencing or classical DNA Sanger sequencing are applicable as well.



## Leica provides: Visually controlled excision of 100% cancer material

Cancer material destined for DNA sequencing should not contain healthy cells from the surrounding which distort the mutation analysis. The Leica LMD systems cut tumor cells precisely under visual control – even at the single cell level.



Human kidney tissue before and after laser microdissection. H & E staining.

DEMO AND  
DETAILS



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