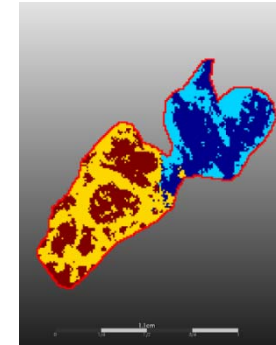


FT-ICR combined with MALDI-imaging – a novel tool to follow the ripening of dry-cured meat



- MALDI imaging enables mass spectrometric analysis of the **distribution** of analytes in a sample
- The imaging can be combined with **targeted** or **non-targeted** MS-analyses
- Visualisation can be targeted to specific analytes or analyte groups or can be performed 'unsupervised' in order to search for differences in distributions of unknown analytes

Potential applications to follow ripening of dry-cured meat:

- Quality control
- Identification of 'ripening markers' and their distribution

MALDI imaging: MALDI FT ICR & MALDI TOF/TOF

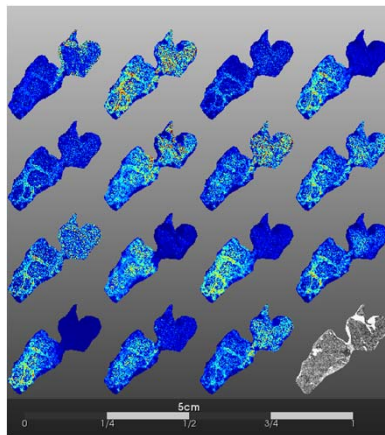


- Sample preparation is crucial
- MALDI imaging of metabolites/small molecules → FT ICR
- MALDI imaging of proteins → MALDI TOF/TOF

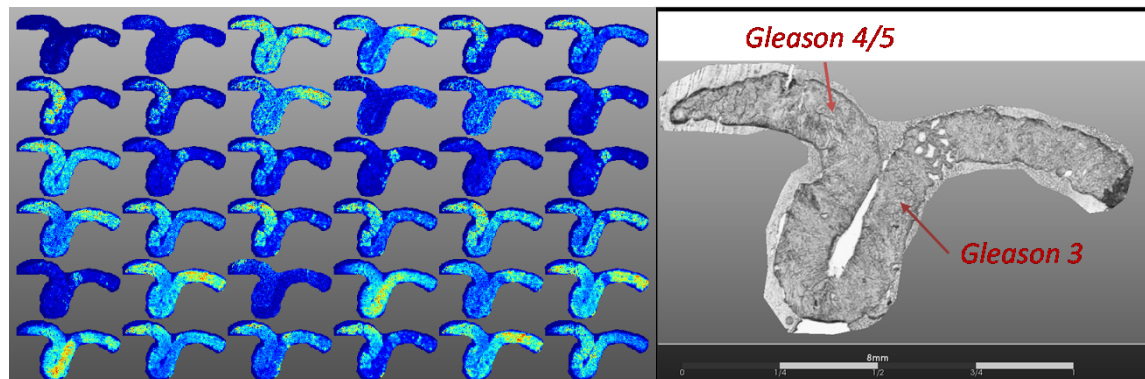
Applications:

- drug and metabolite distribution, biomarker discovery, nanoparticle distribution, food quality, etc.

MALDI imaging of cured ham



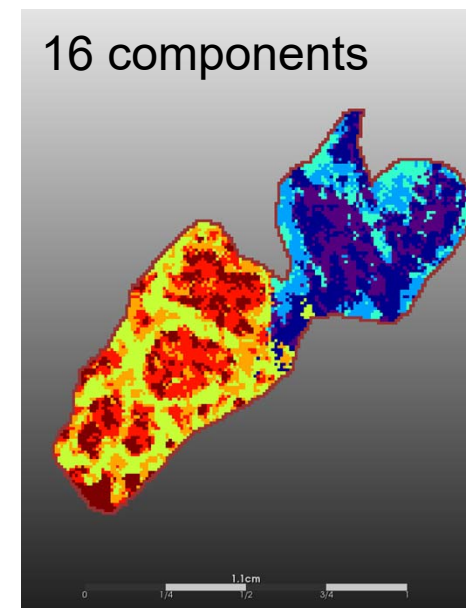
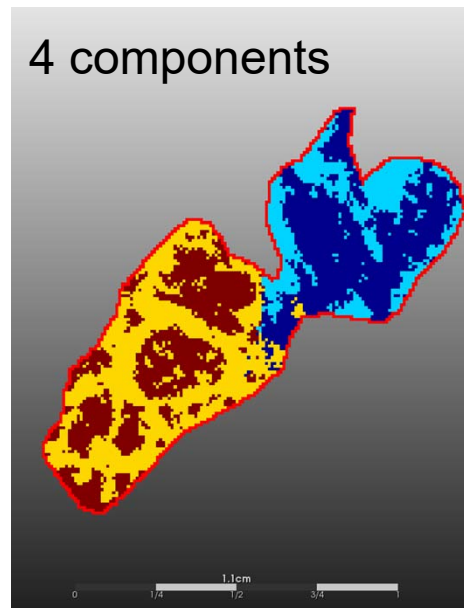
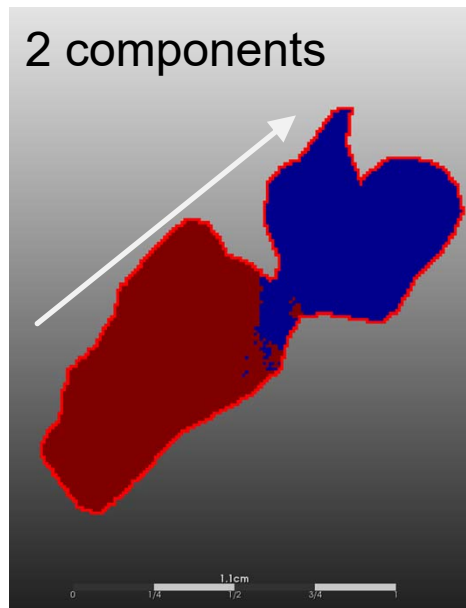
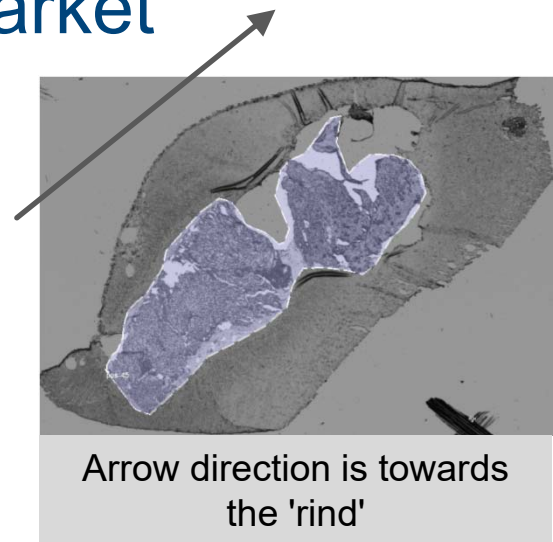
MALDI imaging of prostate with tumour tissue



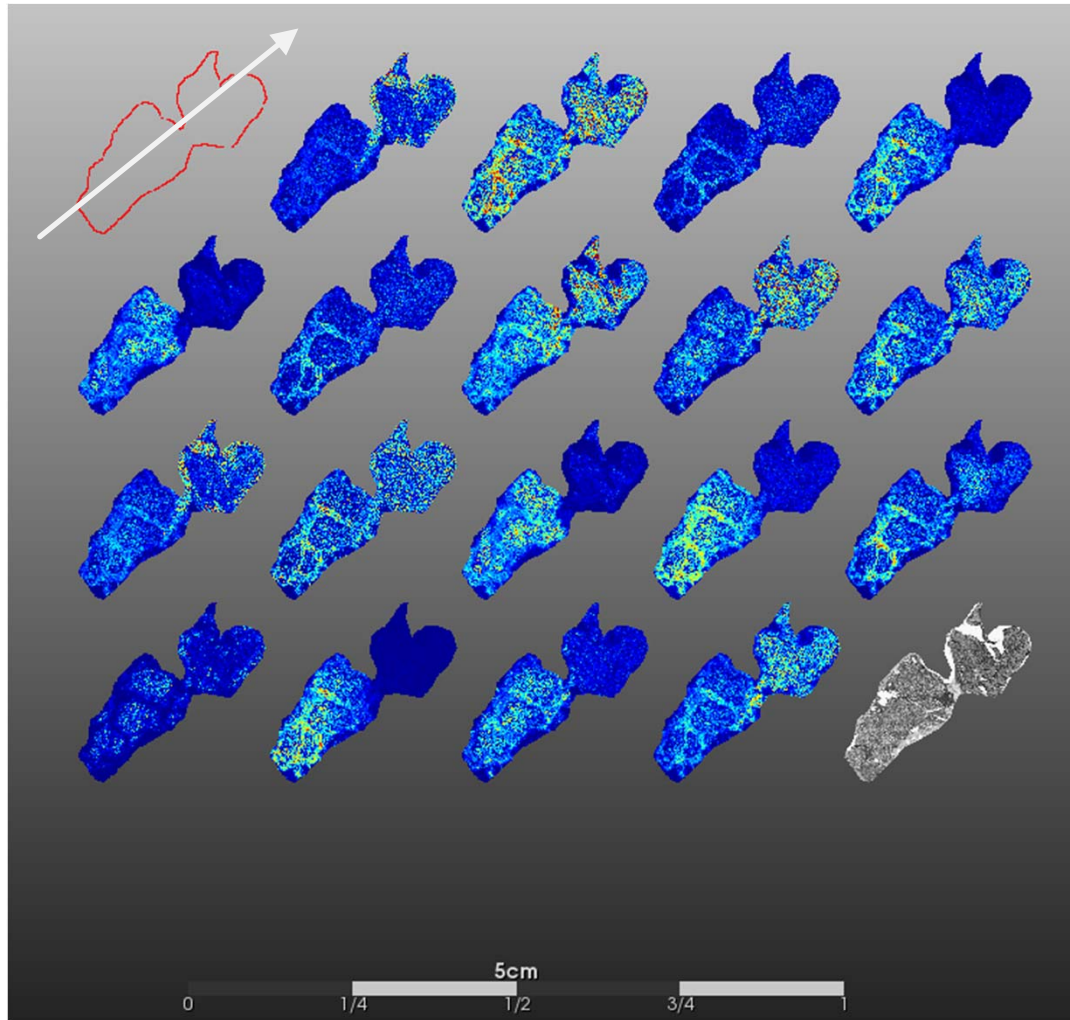
Matching imaging data with pathology

Tests on dry-cured ham from a supermarket

- Frozen ham sample embedded in cellulose matrix
- Acquisition in positive ionisation mode, mass range 150-2000 Da
- Unsupervised data analysis and visualisation
 - Non uniform
 - Two distinct areas containing sub-areas, all having different chemical profiles



Distribution and relative abundance of selected observed ions



- Each picture shows *one specific compound*
- The colour represents the *abundance* (increasing from blue->yellow->red)
- The observed ions are yet to be identified

Available equipment

- ImagePrep
 - For application of MALDI matrix
- MALDI-FT-ICR: Bruker Solarix 12T FT ICR with MALDI source
 - Ultra high resolution MS (up to 10 million)
 - Mass range up to ca 10 000 Da
 - "Metabolite/peptide imaging"
- MALDI –TOF/TOF: Bruker Autoflex III
 - Suitable for small to large analytes
 - Mass range ~ 120 kDa (Linear Mode): Resolution ~ 4000
 - Mass range ~ 6,000 Da (Reflectron Mode): Resolution ~ 11000
 - "Protein imaging"

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