

Laser post-ionization (MALDI-2) coupled to a timsTOF fleX improves the limit of detection for statin drug compounds in MALDI-MS imaging

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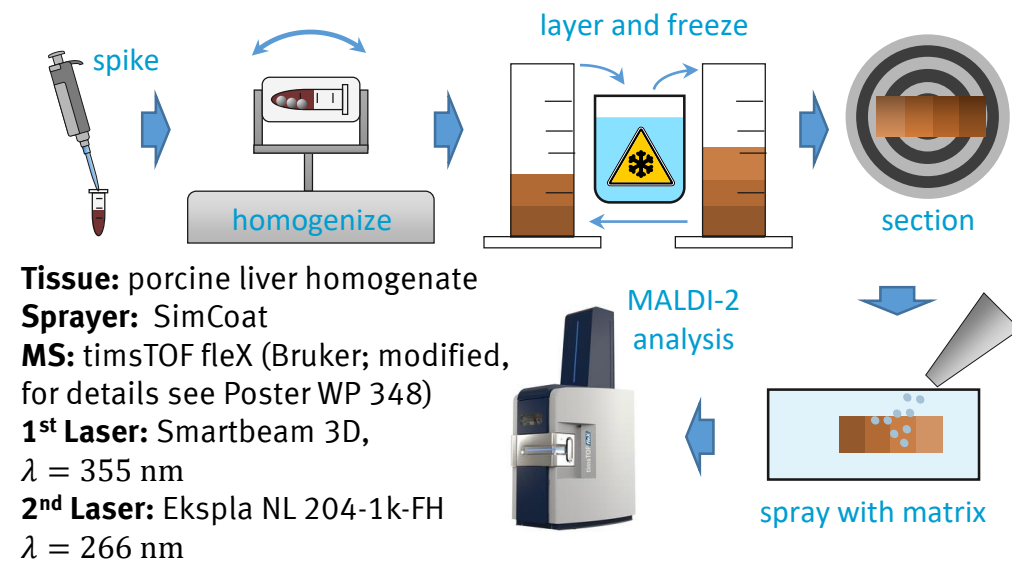
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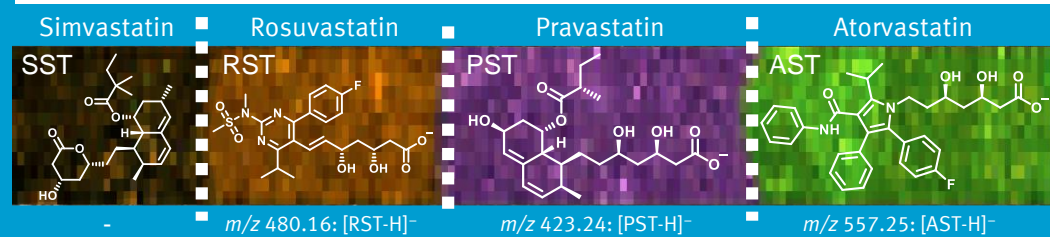
Why statins?

- ◆ Statins comprise some of the most prescribed drugs
- ◆ Inhibition of cholesterol synthesis
- ◆ Prevention of coronary artery disease (CAD)
- ◆ May cause adverse effects in muscles and liver
- ◆ Side effects may differ for lipophilic vs. hydrophilic compounds

Workflow



Parameter Optimization



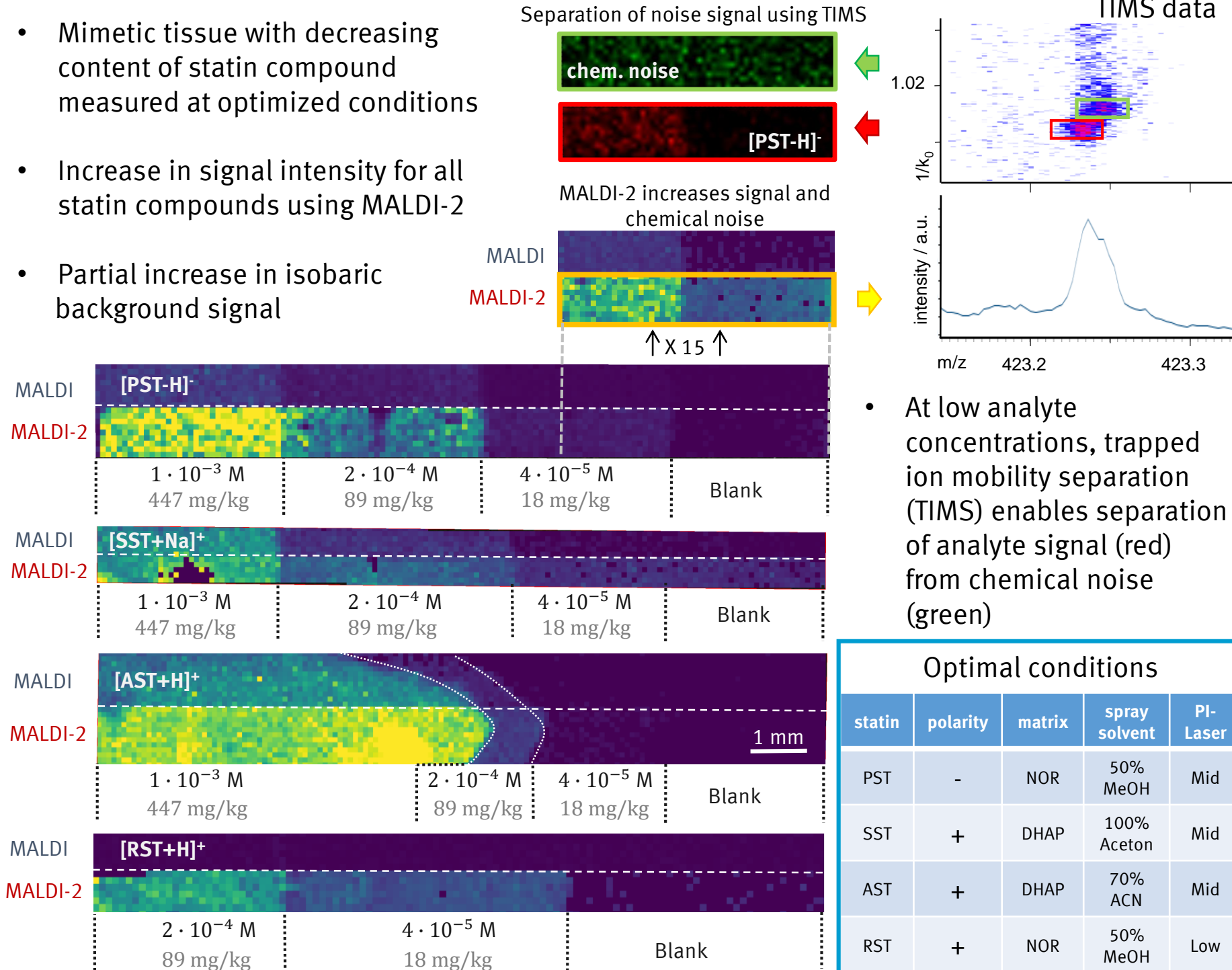
Mimetic tissue with 4 layers containing 1 statin each

Systematic variation of:

- **Matrix**
 - type (2,5-DHAP, Norharmane (NOR), PNA)
 - preparation (solvent system, spray parameters)
- **MALDI-2 parameters**
 - desorption laser pulse energy
 - post-ionization laser pulse energy
 - polarity

Limits of detection

- Mimetic tissue with decreasing content of statin compound measured at optimized conditions
- Increase in signal intensity for all statin compounds using MALDI-2
- Partial increase in isobaric background signal



Conclusions and Outlook

- Systematic optimization revealed polarity of the measurement, solvent type and spraying conditions as well as post-ionization laser pulse energy as key parameters
- MALDI-2 increases signal intensity for all investigated statin compounds under MALDI-MS Imaging conditions
- MALDI-2 also increases background signals
- TMS can be used to isolate analyte signal
- Software needed to determine limits of detection of TMS isolated signal
- Future application to dosed tissue

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