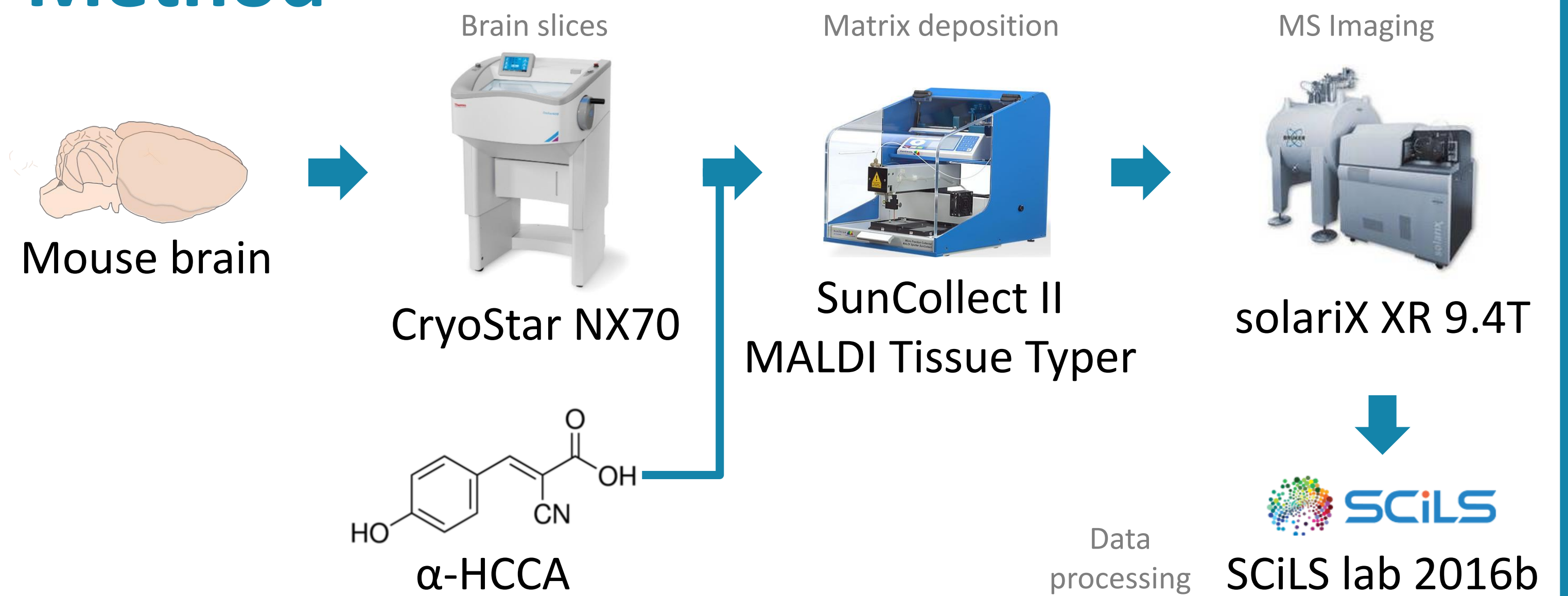


## Introduction

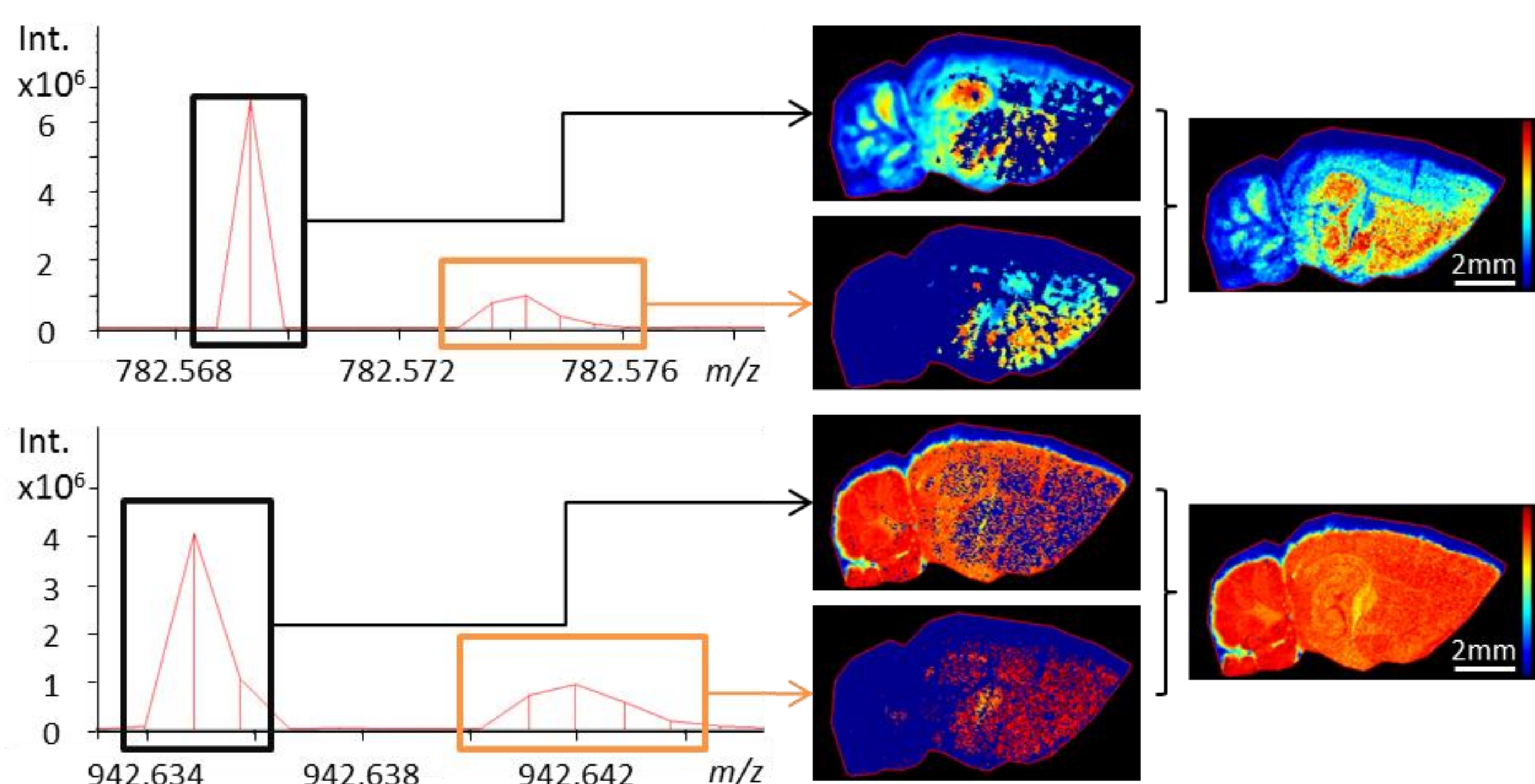
Mass Spectrometry Imaging is often confronted to complex samples where many isobaric compounds can be found. Hence, high resolving power is required especially if the determination of the empirical formula of ions using exact masses is planned. The new generation of FT-ICR fitted with the ParaCell© allows such high resolving power. Usually the ParaCell prevents the distortions of ion cyclotron resonance movements due to dynamically harmonized electronic fields. In this study we show how the total ion current affects this instrument during MS imaging.

## Method



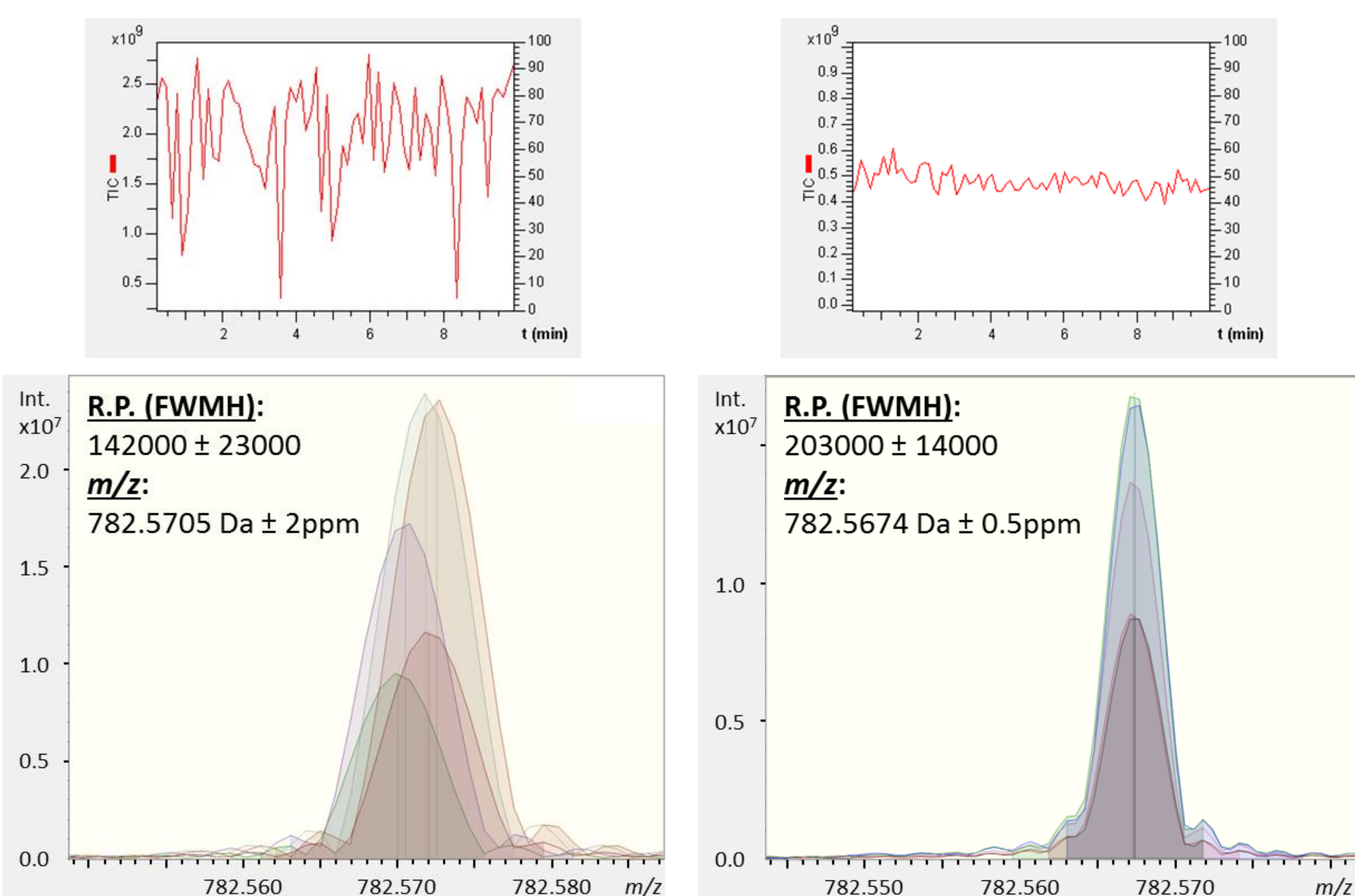
## Results

### 1 Problematic



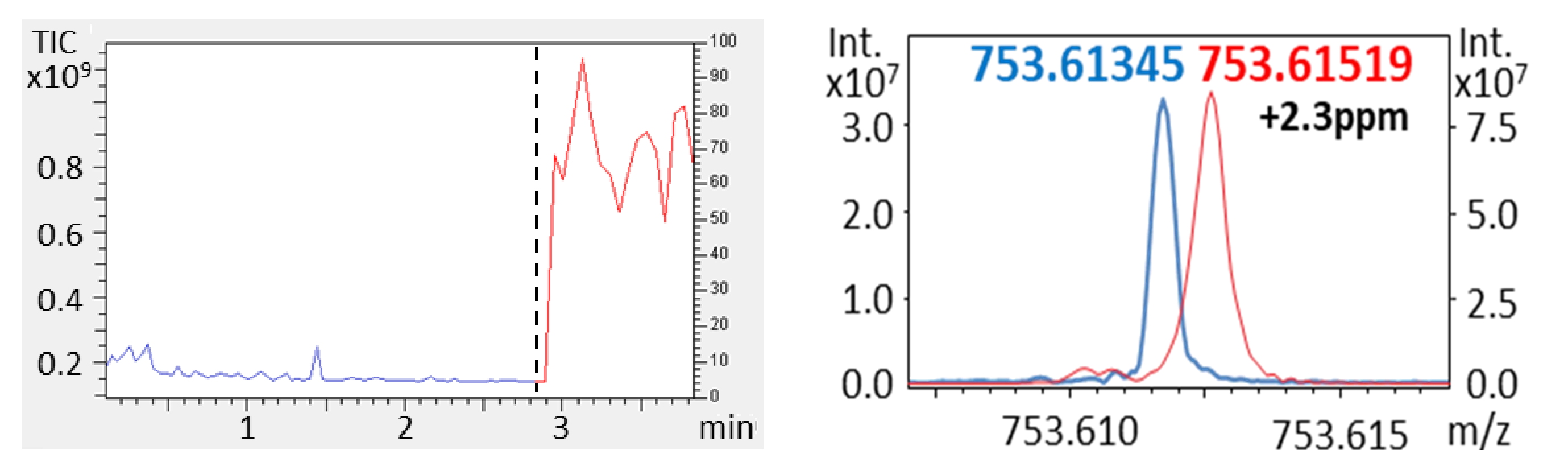
Poor mass accuracy and occasionally peaks multiplication is encountered in MSI, showing incomplete images.

### 4 Solution



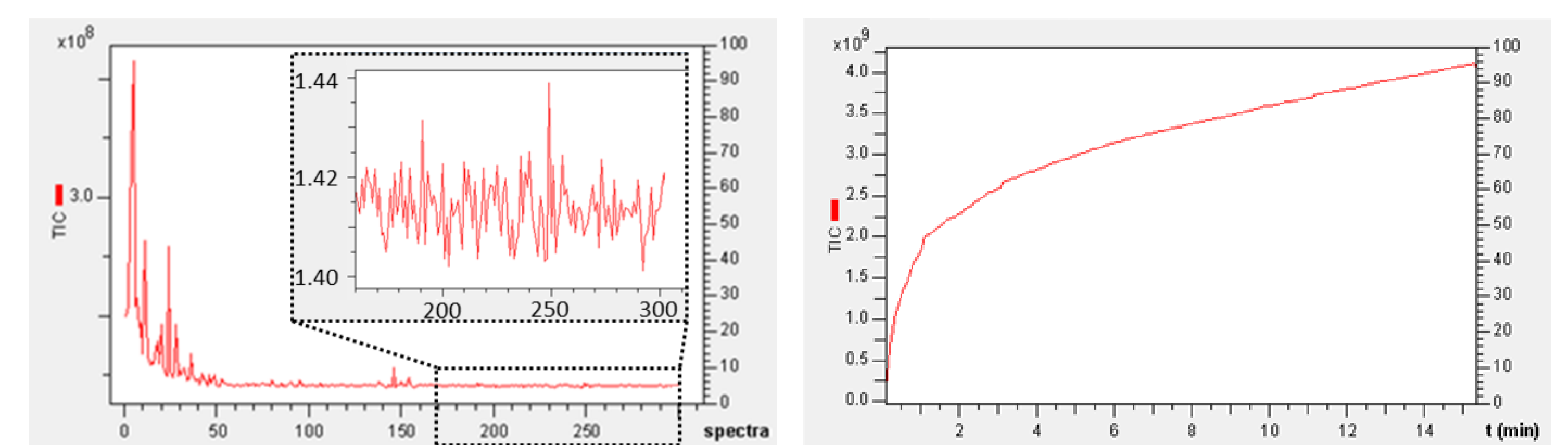
Representation of the TIC over time during an acquisition (up) with their resulting accuracy and resolving power (RP) on a lipid detected in a mouse brain slice (down).

### 2 Origin



Fluctuation of the Total Ion Current (TIC) during the acquisition dramatically affect the mass accuracy.

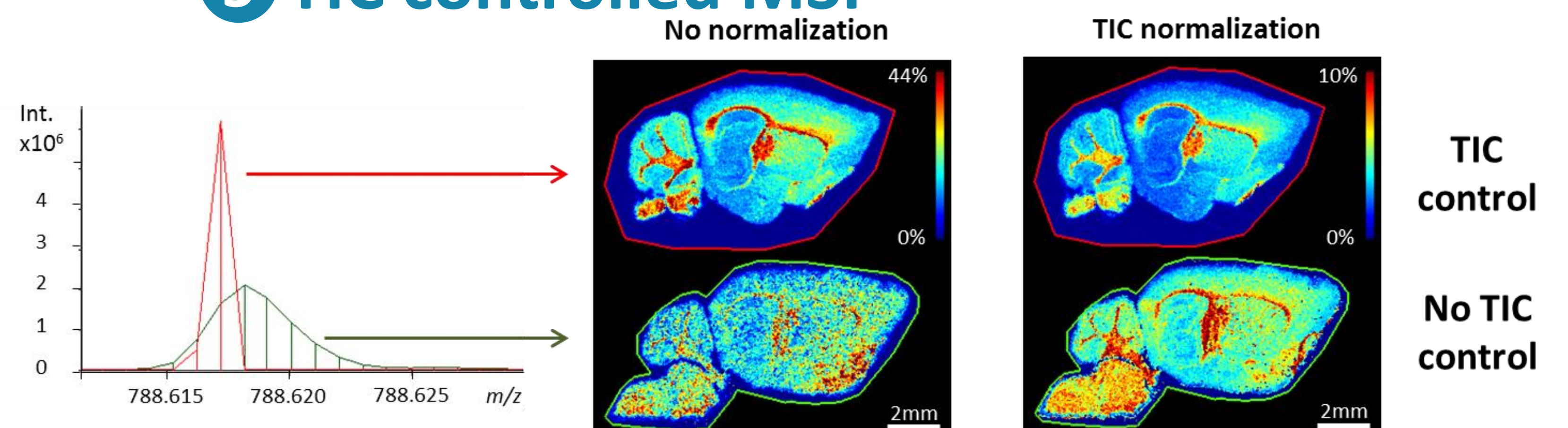
### 3 Total Ion Count behavior



Evolution of the TIC shot by shot (left) and over time (right) for an acquisition summing 400 laser shots.

The behavior of the TIC indicates that a small range of laser shots could offer greater reproducibility and stability while still offering significantly high absolute signal.

### 5 TIC controlled MSI



By controlling the TIC during MSI acquisition, the results are now showing sharper images with better mass accuracy on par with MS specifications.

## Conclusion

When working with dynamically harmonized FT-ICR cell, a greater stability of the TIC has is required to reach instrument specifications. In this work the TIC has been controlled and database searches now match better with the results due to the high resolution and great accuracy.

