

## New developments in MALDI applications for the pharmaceutical industry

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Matrix-Assisted Laser Desorption Ionization (MALDI) Mass Spectrometry Imaging (MSI) has become a powerful tool for different applications in life sciences and opens up new possibilities in further scientific fields. MSI gained tremendous interest in the pharmaceutical industry in the last years and get more and more accepted as standard validation tool for drug development studies. The different application possibilities of Brukers two MSI workhorses, rapifleX and solariX 2XR, will be explained. While the rapifleX sets a new benchmark in terms of speed and spatial resolution, the Bruker solariX 2XR MALDI-FTICR represents a highly complementary imaging MS system, which offers unrivaled mass resolving power of up to  $R = 15$  million and outstanding mass accuracy in the ppb range. This results in MALDI imaging data that represent an ultimate level of convenience, which allows for the straightforward identification of compounds off-tissue directly, for example when analyzing drug distribution and metabolization. Applications examples for both instruments and important features for successful MSI experiments will be shown.

Beside MSI rapifleX provides an alternative format interesting for the pharmaceutical industry: high throughput screening (HTS - 10,000 compounds/day) and ultra high throughput screening uHTS (uHTS - 100,000 compounds/day) of small molecules, peptides and proteins for enzyme assays. With analysis times less than 1 second/sample and nanolitre volumes, this technique offers a MS format with throughput and sample volumes closer to traditional HTS/uHTS fluorescence based technologies but with a label-free, direct-detection assessment of activity. An example will be given to present the feasibility in a pharma industry application.