

## **Spatial metabolomics applications in toxicology and drug research**

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### **Abstract:**

Metabolites and drug distribution analysis is an important aspect in toxicology and drug research. In this presentation, I summarize the spatial metabolomics applications of MALDI-Mass spectrometry imaging (MSI), firstly in toxicology which deals with Drug induced liver injury (DILI), and secondly in drug research which deals with drug distribution in tumors.

In DILI, we investigated the compound-X treated rat liver tissue MSI to elucidate the associated lipids and bile acid changes. We have shown lipid up-regulation and accumulation in fat droplets in treated rat livers clearly indicating macrovesicular steatosis. Additionally, we were able to describe spatial distribution and slight down-regulation of two major bile acids in the liver. In drug research, we analyzed the localization of compound-Y drug and its metabolites in xenograft tumors using MALDI-MSI, whereupon we found that the drug is found higher at the tumor peripheries and the MSI quantification corroborated well with the absolute quantification by LCMS.

Thus by, we demonstrate that how new technologies such as MALDI-MSI can be useful in the toxicological and drug research to complement histopathological evaluation and drug efficacy respectively.