

The Desorption / Ionization Mass Spectrometry on Nanopore Materials for Small Molecule Analysis and its Application

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Matrix-assisted laser desorption/ionization time of flight mass spectrometry (MALDI-TOF-MS) was developed with the powerful method for analysis of large biomolecules. MALDI-TOF-MS for the analysis of small molecules, however, was little attention, because most of the widely used matrixes have low molecular weight, many matrix related peaks in the low mass range, which even suppresses the sample peaks from noise signals.

In this study, the use of nanopore materials as an energy mediator in laser irradiation has a potential to generate low-mass analyte signal without noise and thus to precisely interpret analyte in low-mass range.

To validate the application for drug screening, binding assay was performed by the incubation of human serum albumin with drug library.

In conclusion, our proposed matrix-free approach is simple but powerful method to analyze low-mass molecules with high sensitivity and reliability and could be applied to small molecule screening, for instance, inhibitor, enzyme substrate, metabolite and drug screening.