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## Extractive electrospray ionization mass spectrometry for biosample analysis

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Mass spectrometry (MS) is one of the preferable analytical techniques for sensitive characterization of biological samples on the molecular levels. Technological innovations advance mass spectrometry for sophisticated applications in many fields including but not limited to chemistry, material sciences and life sciences. For trace analysis of a typical biological sample, classical MS techniques require multi-step sample pre-treatment (e.g., grinding, extraction, separation, pre-concentration, etc.) to obtain molecular information from the native biological samples, especially for detection of trace analytes distributed in the 3-dimensional volume of a bulk sample. Commonly associated with sample pre-treatment are biological degradation, chemical reactions, reagent contamination, and material losses. Apparently, tedious sample pretreatments strangle the breakthrough of high throughput in analytical mass spectrometry. By isolating the high electric field required for ionization from any biological sample, extractive electrospray ionization (EESI) allows direct detection of small metabolites and/or large proteins distributed either on surfaces or inside bulk tissue by mass spectrometry, without any sample pretreatment. Experiments demonstrated that EESI-MS minimizes matrix effects during the ionization process, enabling real-time, *in vivo* analysis of biofluids, biosurfaces, aerosols and living objectives. Therein, the fundamental principle, instrumentation and typical applications of EESI-MS for biological analysis can be summarized, giving emphases on progresses in our lab for sensitive qualitative/quantitative detection of chemicals located inside a bulk tissue of whole-volume ( $\geq 20 \text{ mm}_3$ ), with neither mashing/grinding the sample nor matrixes clean-up. Furthermore, the emerging utilization of EESI-MS for sequentially acquiring metabolites, lipids, and proteins in a single tissue sample will be presented for the first time.

### Biography

Huanwen Chen has completed his PhD from Jilin University and Postdoctoral studies from Aston Lab, Purdue University. He is the Director of Jiangxi Key Laboratory for Mass Spectrometry and Instrumentation. He has published more than 200 papers in reputed journals and has been serving as an Editorial Board Member of *repute*.

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