S16-2 Detection of biological active compounds using mass spectrometry

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Matrix-assisted laser desorption ionization (MADLI) combined with time-of-flight mass spectrometry (TOF MS) is largely used for a rapid and sensitive analysis of biological compounds. The advantages of MALDI include good sensitivity, and good tolerance to biochemical buffers and salts. In addition, since there is usually only a singly charged ion formed it is a good choice for the analysis of heterogeneous samples. Therefore, a mass profile of biological compounds in the cells will be observed when the frozen section prepared from a tissue was directly applied into MALDI-TOF MS analysis. Recently, mass spectrometry imaging (also known as imaging mass spectrometry) is a technique used in mass spectrometry to visualize the spatial distribution of compounds, such as biomarker, metabolites, peptides or proteins by their molecular masses. On the other hands, the use of matrix like α-cyano-4-hydroxycinnamic acid and dihyroxy benzoic acid not only suppressed the matrix related background ions but also the compound signals in the low-mass range. To solve this problem, immobilized matrix or meso-tetrakis(pentafluorophenyl) porphyrin (F20TPP) were applied into detection of caffeine or steroid hormone. 4-mercaptohydrocinnamic acid could be binding to gold chip. F20TPP has a high molecular weight (MW 974.6) compared to other matrix. Immobilized matrix and F20TPP were found to be advantageous owing to less interference in the low mass range. Moreover, a matrix-free strategy for biomolecular mass spectrometry based on pulsed-laser desorption–ionization from a porous silicon surface has proposed.