Multidimensional Liquid Chromatography MALDI-MS of Whole Cell Lysate using a High Performance Continuous Vacuum Deposition Interface.

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ABSTRACT

The 2-D chromatographic approach to proteomic analysis has high peak capacity but suffers in dynamic range of many orders of magnitude. The Multidimensional Chromatography – Mass Spectrometry approach improves the separation in both dimensions and improves overall sensitivity. The use of high performance liquid chromatography (HPLC) in the first dimension and electrospray ionization mass spectrometry (ESI-MS) in the second dimension allows for improved separation and identification of many proteins simultaneously. The Multidimensional Chromatography and Mass Spectrometry approach is highly sensitive and can be used on a variety of samples ranging from exudates to cell lysates.

RESULTS AND DISCUSSION

The use of distinct sample manipulation protocols enables on-line fractionation in both dimensions. The LC gradient runs in the first dimension and the amount of sample is defined based on a solvent gradient. The LC gradient run time is typically less than 1 hour. The LC effluent is combined with matrix flowing at 1.25μL/min. The effluent is then deposited onto a vacuum chamber and the sample deposited on a vacuum chamber using a static deposition system. The upper frame in Figure 3 shows the LC trace obtained from a single sample used for the MALDI-MS experiment. The lower frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment.

It should be noted that the MALDI-MS spectrum obtained from the MALDI-MS experiment using a vacuum deposition interface is obtained using a static deposition system. The lower frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The upper frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The lower frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The upper frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The lower frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The upper frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The lower frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The upper frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment. The lower frame in Figure 3 shows the MALDI-MS spectrum obtained from a single sample used for the MALDI-MS experiment.