Title: **AUTOMATED SELECTION OF MICROORGANISMS AND IDENTIFICATION USING MALDI**

FIELD OF THE INVENTION

The present invention generally relates to a method for locating and selecting a colony of microorganisms and identifying microorganisms using MALDI, in particular MALDI-TOF-MS (Matrix Assisted Laser Desorption and Ionization Time-of-Flight Mass Spectroscopy) and the systems for performing such methods.

MALDI-analysis is a useful tool for solving structural problems in biochemistry, immunology, genetics and biology. Samples are ionized in the gas phase and a time of flight (TOF) analyzer is used to measure ion masses. TOF analysis begins when ions are formed and are accelerated to a constant kinetic energy as they enter a drift region. They arrive at a detector following flight times that are proportional to the square root of their masses. A mass spectrum is created because ions of different mass arrive at the detector at different times.

Mass spectrometry can be a powerful tool in the fields of drug discovery and development, genotyping, and proteome research. In addition MALDI has already been used for characterization and identification of bacteria and microorganisms. Current trends in research are to analyze larger and larger numbers of samples using quantities of individual samples ranging from the micro-mole levels to ato-mole levels. As a result, samples are also becoming smaller and needs exists for efficient and reliable acquisition of the correct amount of micro-organisms and accurately depositing a sample of the acquired amount on a target plate used in the MALDI-instrument.

In a typical MALDI TOF MS operation, the sample to be analyzed is spotted or deposited on a metal plate (also called target plate or MALDI-plate), reagents are added (matrix) that support ionization, and then they are dried to form crystals. In these instruments, the target plate is positioned in a fixed position in the MALDI-instrument. The target plate has a plurality of depositing spots (e.g. from 24 to 384 depositing spots on a single target plate) and these depositing spots have a fixed orientation with regard to the edges of the target plate. The target plate is positioned on an X-Y stage so that an obtained sample of a colony of microorganisms can be