

# Flow Analysis XIII



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## MALDI-MS for microorganism identification in contaminated groundwater

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An increased concern on the impact of hydraulic fracturing on the quality of groundwater has emerged as the used fluids can enter the groundwater due to spills on the surface while the well is hydraulically stimulated, during transport and storage, or through faulty well casings. Some studies have been performed to understand if chemical contamination of groundwater is related with hydraulic fracturing activities by measuring, for example, metals, ethanol and methanol levels. However, as far as we know, no studies have been performed to determine the influence of hydraulic fracturing on the microorganism community of groundwater. The fluids produced from this activity are constituted of several contaminants which can, on one hand, be a source of nutrients for microorganisms allowing their growth or, on the other hand, be toxic inhibiting their growth. In fact, if bacteria found in these contaminated waters can grow in the presence of hazardous chemicals, a possible source for bioremediation can be explored. For that purpose, matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) is a technique that allows the rapid and specific identification of microorganisms with low costs when compared to conventional microbial methods. In this work, MALDI-TOF MS was used for bacteria identification in contaminated groundwater and the possible application of the identified bacteria to bioremediation was evaluated by determining their ability to degrade toluene and chloroform.

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