

Single-Cell-Identification of water borne pathogenic Pseudomonas by means of Micro-Raman Spectroscopy

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In the field of hygienic monitoring, the successful identification of microorganisms is dependent on a large biomass to realise different culture tests, immunoassays or molecular methods. Micro-Raman spectroscopy provides a fast and sensitive analysis method on single cell level [1]. Microscope objectives with a high numerical aperture and high magnification are used to focus the light and guarantee a spatial resolution of approx. 1 μm [2]. The identification bases on the spectroscopic fingerprint of the molecular composition of one bacteria cell. With this technique a noticeable reduction of sample preparation and analysis time especially in routine control of drinking or recreational water is feasible. Under these conditions, a direct examination of microbes extracted from their natural habitat without pre-cultivation might be possible [3, 4].

Pseudomonas is widespread genera in soil and water areas of the environment. This opportunistic organism is a major cause of nosocomial infection, microbial spoilage of food and hazards in spas and drinking water. Its presence is also associated with other waterborne microbes. For limiting the impact of a contamination a fast and direct analysis of such hygienically relevant microorganisms has to be established. In this contribution we demonstrate the identification of both single bacteria cells of different *Pseudomonas* species with standard cultivation conditions and cultivation in tap water.

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References:

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