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High-Throughput Fingerprinting of Rhizobial Free Fatty Acids by Chemical Thin-Film Deposition and Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry

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Optimized protocol for Fingerprinting of Rhizobial Free Fatty Acids

IPB scientists, in close cooperation with Russian researchers, have published a straightforward protocol for the quantification of free fatty acids from the nitrogen-fixing bacteria *Rhizobiales*. As mutualistic symbionts of legumes, these bacteria are of great ecological and economic importance. Since the fatty acid profiles of *Rhizobiales* influence plant root infiltration and therefore successful symbiosis, quantification of these fatty acids is particularly interesting.

In contrast to conventional analytical methods, such as gas or liquid chromatography, the novel protocol combines matrix-assisted laser desorption/ionization-time of flight mass spectrometry (MALDI-TOF-MS) and Langmuir technology, which enables the incorporation of fatty acids in monolayers with high regularity at the molecular level. This combination ensures higher sensitivity and derivate stability. Simultaneously, sample preparation is less time-consuming and analysis less susceptible to artifacts. The step-by-step protocol is therefore particularly useful for high-throughput fatty acid fingerprinting.

Reference:

Gladchuk, A.; Shumilina, J.; Kusnetsova, A.; Bureiko, K.; Billig, S.; Tsarev, A.; Alexandrova, I.; Leonova, L.; Zhukov, V.A.; Tikhonovich, I.A.; Birkemeyer, C.; Podolskaya, E.; Frolov, A. High-Throughput Fingerprinting of Rhizobial Free Fatty Acids by Chemical Thin-Film Deposition and Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry. *Methods Protoc.* 2020, 3, 36.