

First Results With a Lab-on-a-Chip System for a Fast *Phytophthora* Diagnosis¹

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Abstract

For *Phytophthora* spp. that are quarantine or regulated organisms, highly specific and sensitive diagnostic tools are recommended for surveys and monitoring. Furthermore, these diagnostic techniques should give results within a short time and should not be too expensive. The techniques currently used for routine diagnosis of *Phytophthora* spp. in plant tissue are mainly molecular techniques (conventional and real-time PCR) and direct isolation. They require that samples must be brought to a diagnostic lab with specific equipment. This takes time and means financial losses for the commercial nursery industry because they have to stop plant sales until results are available. Furthermore, with PCR, only a single *Phytophthora* sp. can be detected per run. Therefore, techniques that can be used directly in the field and that can detect multiple *Phytophthora* spp. at a time would be preferred.

Industry and academics collaborated to develop a chip-based technical platform that miniaturized hybridization and PCR on a chip (Julich, S.; Riedel, M.; Kielpinski, M.; Urban, M.; Kretschmer, R.; Wagner, S.; Fritzsche, W.; Henkel, T.; Möller, R.; Werres, S. 2011. Development of a lab-on-a-chip device for diagnosis of plant pathogens. *Biosensors and Bioelectronics*. 26(10):4070–4075). This technology will be improved and different techniques for sample preparation will be tested. First results on the specificity of the developed probes tested with *in vitro* samples will be presented. Both projects were funded by the German Federal Office for Agriculture and Food.

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