DNA-APTAMERS AS A NOVEL STRATEGY IN AGRICULTURE TO CONTROL THE GRAY MOLD DISEASE CAUSED BY *BOTRYTIS CINEREA*

López Laguna, Alba; Polonio, Álvaro; Ruíz Jiménez, Laura; Vielba Fernández, Alejandra; Pérez García, Alejandro; Fernández Ortuño, Dolores

Botrytis cinerea, the causal agent of the gray mold disease, is one of the main limiting factors of horticultural crops production worldwide. Its control is very dependent on the use of fungicides; however, this fungus has been categorized by FRAC (*Fungicide Resistance Action Committee*) as a high-risk pathogen for fungicide resistance development. In addition, and according to the "farm to fork" strategy of the European Green Deal, the diversity of fungicides available to growers will be reduced by 50% in 2030. For all these reasons, new advances and technologies are needed to control this important harvest and postharvest disease.

Aptamers, also called chemical antibodies, are small synthetic single-stranded DNA or RNA molecules that fold into unique three-dimensional structures, allowing them to bind specifically to a target molecule with high stability. In this work, two DNA aptamers against the SOD1 protein of *B. cinerea* (BcSOD1) were developed. BcSOD1 is involved in the virulence/pathogenicity of *B. cinerea* as it catalyses the dismutation of the superoxide-ion, produced as a host plant defence system. To test the effectiveness of both aptamers, sensitivity assays (effect on conidia germination, detached leaf, and fruit assays), fungal biomass analysis and aptamer uptake studies were carried out. The results showed that both aptamers were taken by the fungus and inhibited the conidia germination of *B. cinerea* by 60%. Furthermore, it was demonstrated that both were able to reduce *B. cinerea* growth and fungal biomass by 50% and 60%, respectively, on tomato leaves and apple fruit.

These results demonstrate the potential, for the first time in agriculture, of DNA aptamers to be novel candidates that could be included within the different strategies to control the gray mold disease.

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