Poster 29

Tomato transcription factors regulate defence response against biotic stresses

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Tomato is one of the most economically important vegetable crops throughout the world. However, it is affected by a panoply of different pathogens that reduce yield and affect product quality, causing symptoms including wilts, leaf spots/blights, fruit spots and rots. Tomato diseases are mainly caused by fungi, but also by oomycetes, bacteria, viruses, viroids and nematodes. The study of plant-pathogen system in tomato arises as an ideal system for better understanding the molecular mechanisms underlying disease resistance, offering an opportunity of improving yield and quality of the products. Among several genes that have been identified in tomato response to pathogens, we highlight those encoding the transcription factors (TFs). TFs are considered central components of plant innate immune system and basal defence in diverse biological processes. They act through sequence-specific interactions with cis-regulatory DNA elements in the promoters of genes and are key regulators of tomato defence response against a wide array of pathogens linked to important diseases, together with a complex cross-talk between different signal transduction pathways.

Here we discuss recent studies of tomato TFs regarding defence responses to biotic stresses. Hence, we focus on the identification and role of different families of TFs selected for their abundance, importance, and the availability of functionally well-characterized members in response to pathogen attack. Genes that encode TFs as master regulators of stress-related genes offer extended possibilities related to their use for engineering pathogen resistance in tomato plants, arising as candidates for tomato breeding, taking advantage of the newly emerging molecular techniques applied to plant breeding in the genomics and genome editing era.

This work is supported by the project “Development of a new virus-based vector to control TSWV in tomato plants” with the references ALT20-03-0145-FEDER-028266 and PTDC/ASP-PLA/28266/2017, and the project “Control of olive anthracnose through gene silencing and gene expression using a plant virus vector” with the references ALT20-03-0145-FEDER-028263 and PTDC/ASP-PLA/28263/2017, both projects co-financed by the European Union through the European Regional Development Fund, under the ALENTEJO 2020 (Regional Operational Program of the Alentejo), ALGARVE 2020 (Regional Operational Program of the Algarve) and through the Foundation for Science and Technology (FCT), in its national component. M. P. is supported by Portuguese National Funds through FCT/MCTES, under the PhD scholarship SFRH/BD/145321/2019, co-financed by the European Social Fund through the Regional Operational Program of the Alentejo.