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A RHAMNOLIPID PRECURSOR TRIGGERS INDUCED SYSTEMIC RESISTANCE IN ARABIDOPSIS

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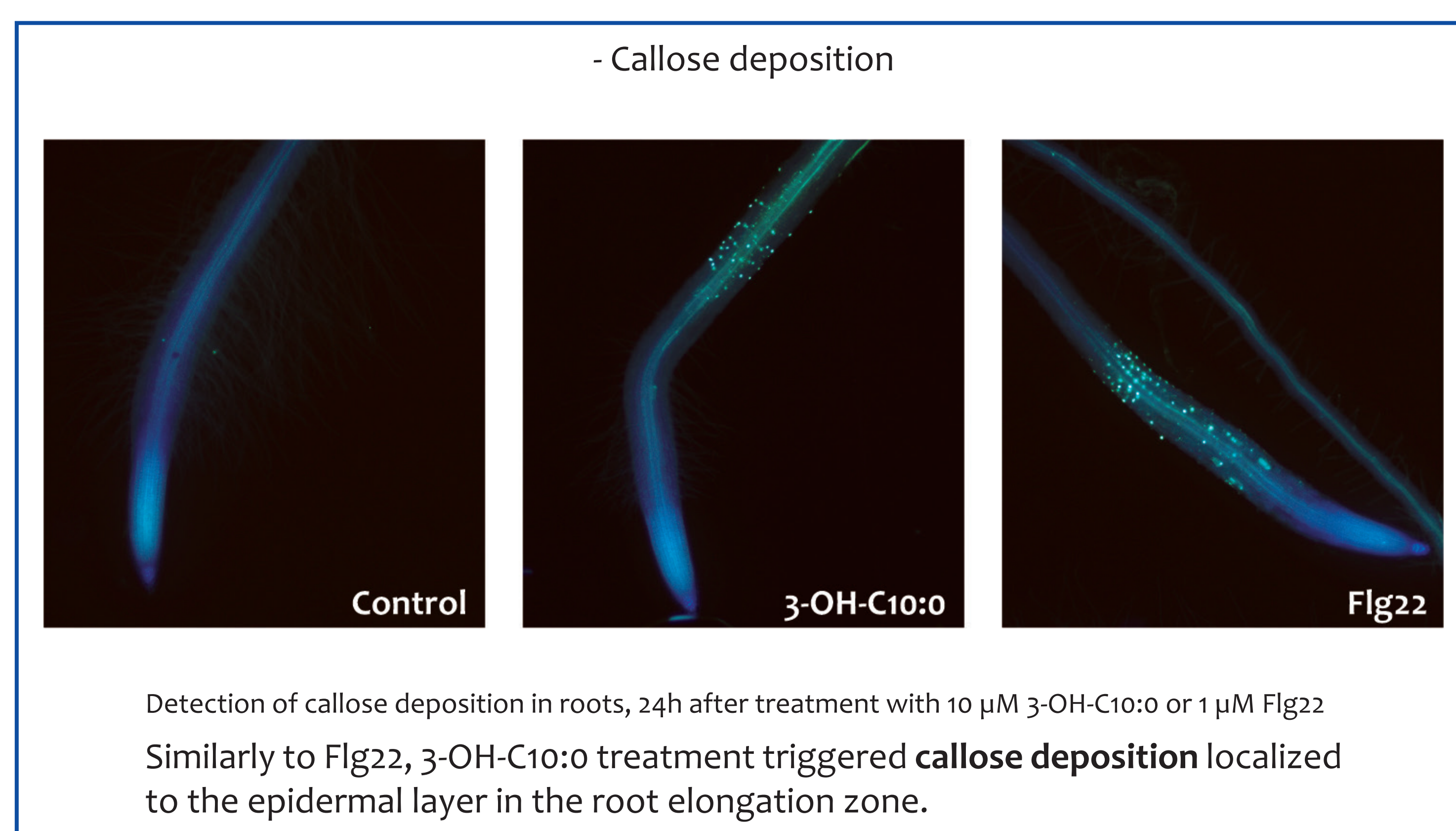
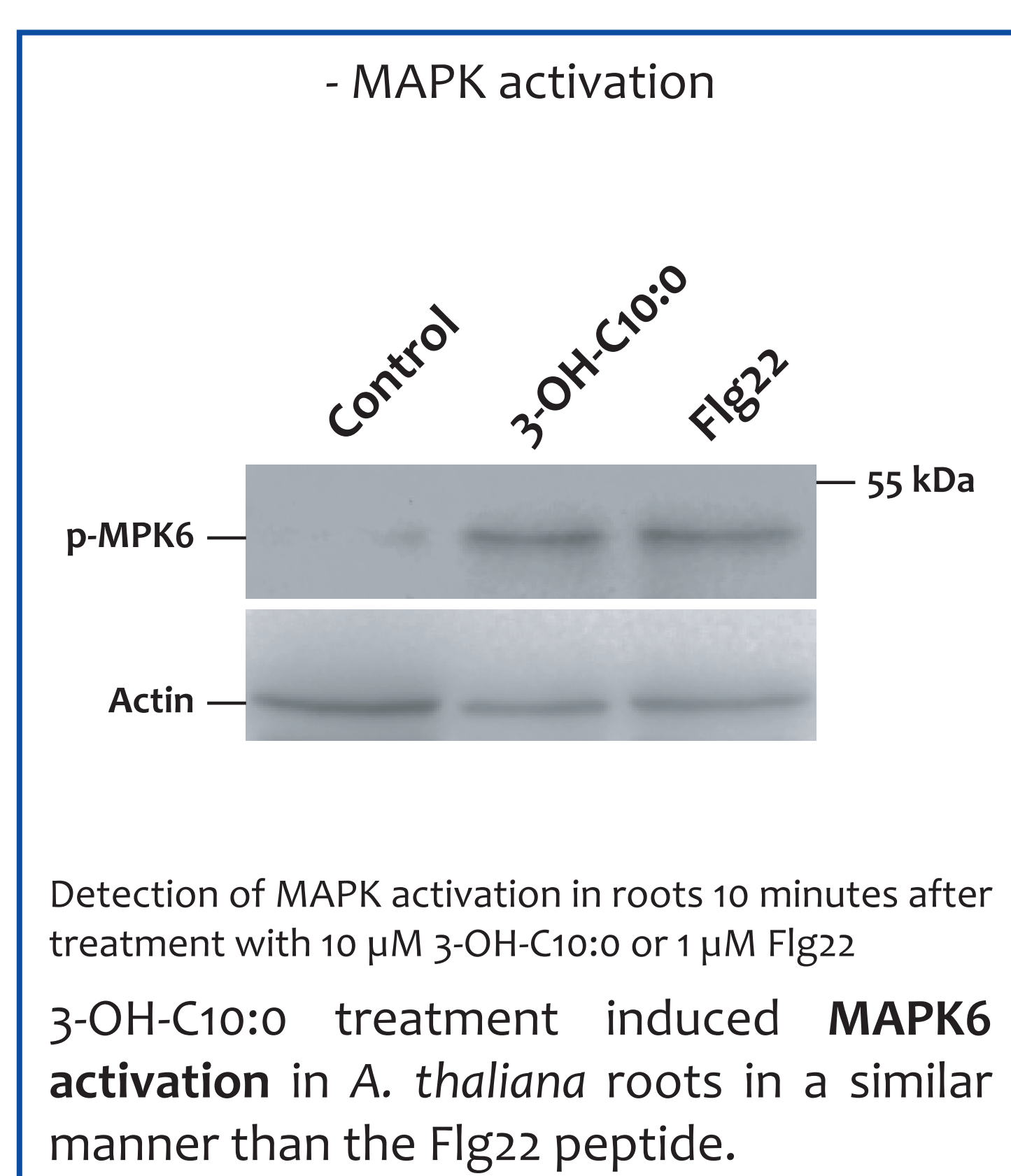
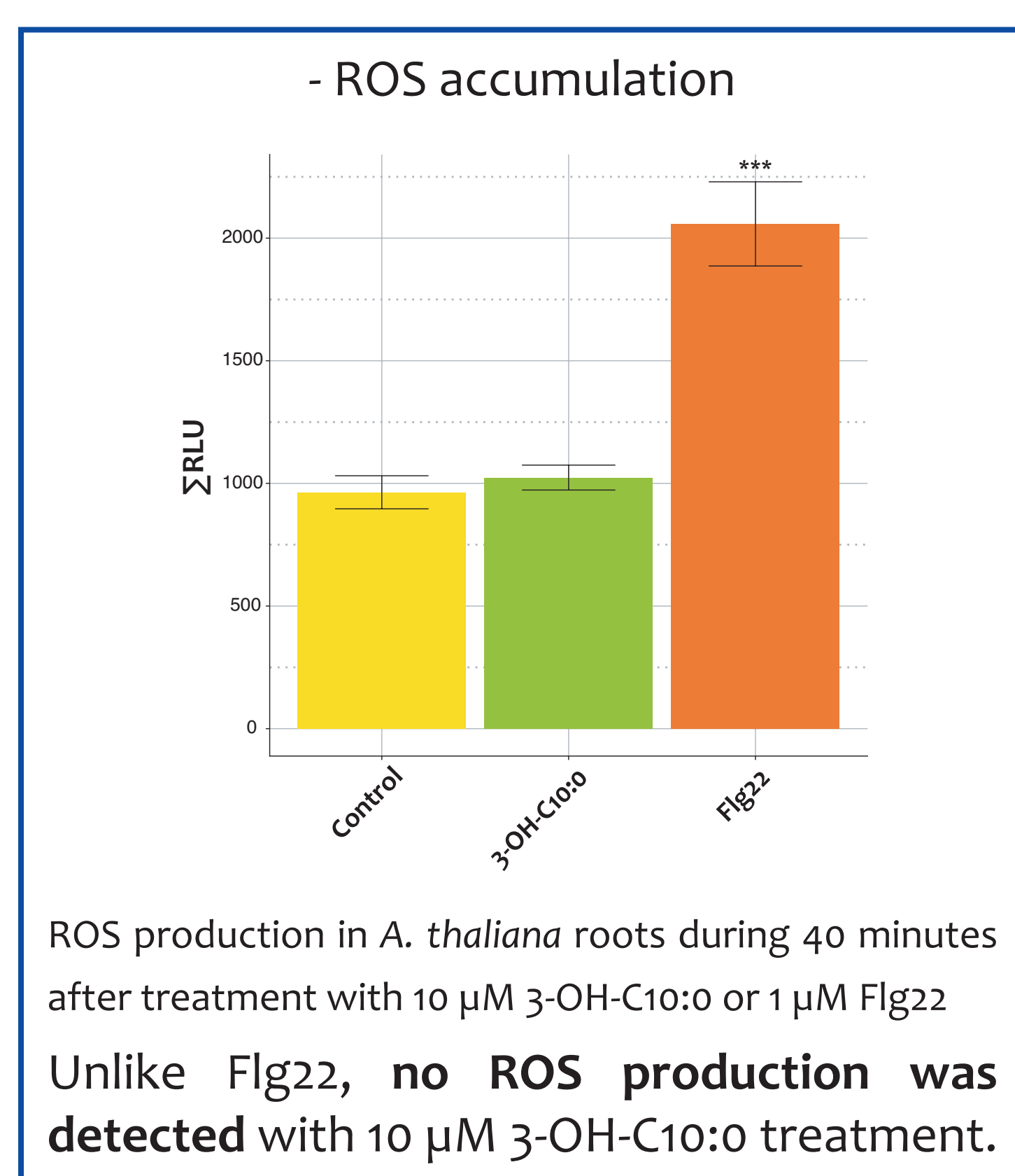
INTRODUCTION

In their environment, plants are frequently challenged by pathogenic microorganisms. To deal with these pathogens, plants possess an arsenal of defence mechanisms, quickly activated following microorganism perception. This perception involves Microbe-Associated Molecular Patterns (MAMPs) that are recognized by plant cells through Pattern Recognition Receptors (PRRs) resulting in plant innate immunity (MTI, MAMP-Triggered Immunity). We previously showed in the laboratory that a natural rhamnolipids secretome (RLsec), produced by *Pseudomonas aeruginosa*, induce classical markers of plant immunity on *Arabidopsis thaliana* leaves and is highly effective on several plants to induce local resistance at the foliar level against phytopathogenic microorganisms^{1,2,3}. Among the RLsec constituents, the 3-hydroxydecanoic acid (3-OH-C10:0) synthesis precursor of rhamnolipids (RLs) was identified.

The aim of this study is to determine if the 3-OH-C10:0 precursor of RLs is perceived by *A. thaliana* roots and if this perception triggers a systemic resistance against the necrotrophic fungus *Botrytis cinerea*.

3OH-C10:0 TRIGGERS IMMUNITY MARKERS IN ROOTS

To investigate the 3-OH-C10:0 perception by roots, commonly used markers of plant MTI were followed.

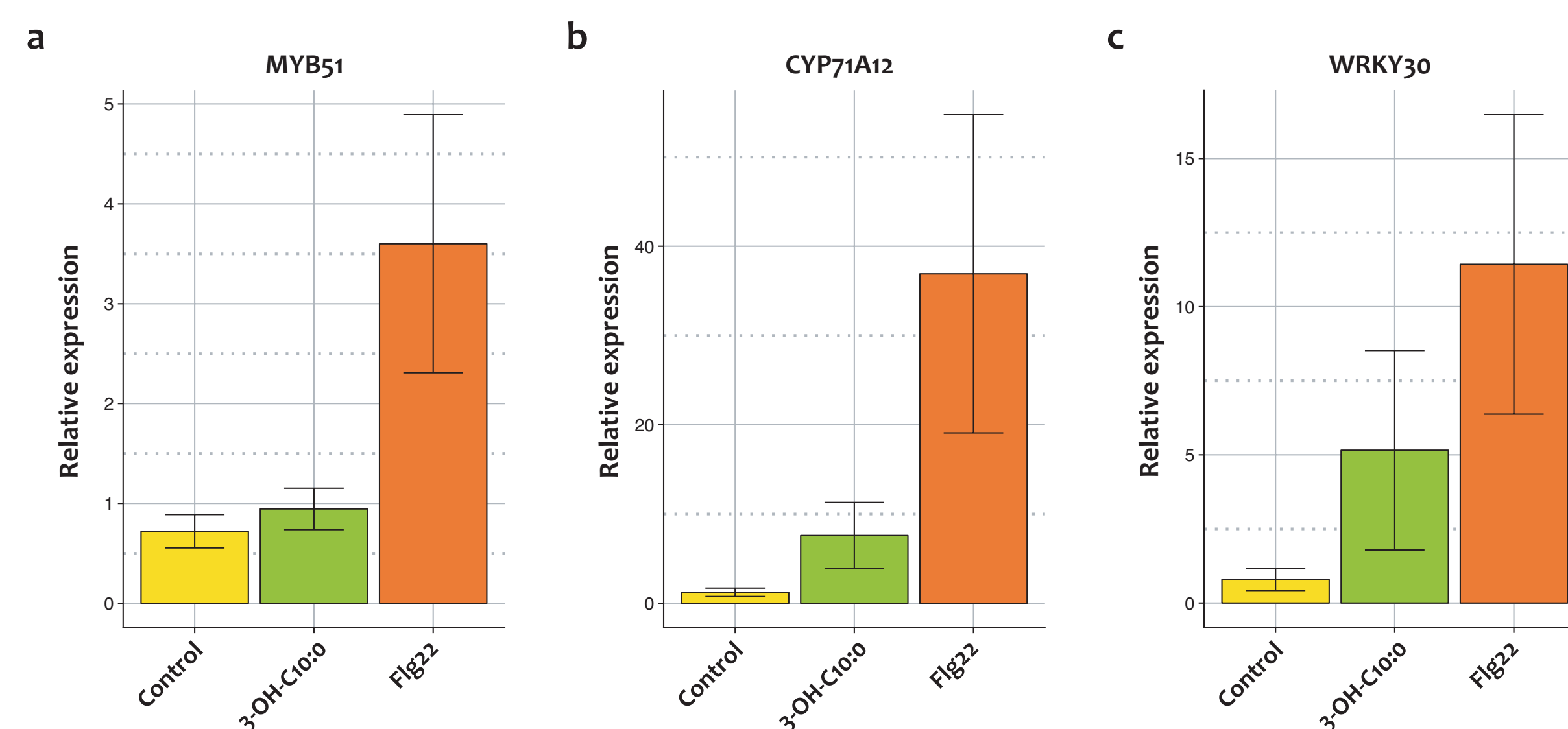


3-OH-C10:0 TRIGGERS TRANSCRIPTIONAL CHANGES IN ROOTS

Expression pattern of the root MTI marker genes, *MYB51*⁴, *CYP71A12*⁴ and *WRKY30*⁵ were followed by qRT-PCR in roots 3h after treatment with 10 μM 3-OH-C10:0 or 1 μM Flg22 as positive control.

- *MYB51* (a) gene expression was significantly induced at 3h after Flg22 treatment but no induction was observed following 3-OH-C10:0 treatment.

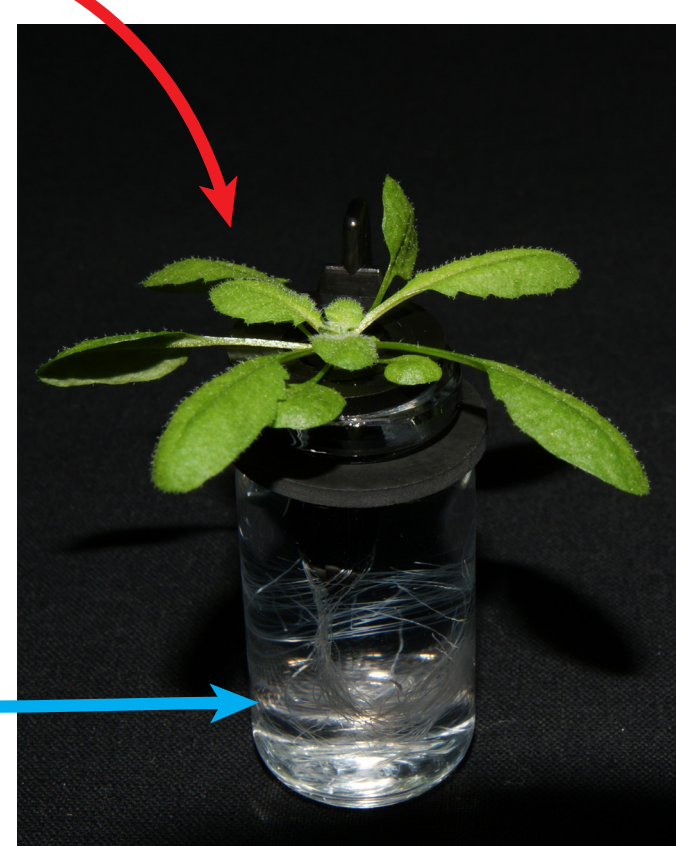
- *CYP71A12* (b) and *WRKY30* (c) genes were induced by both 3-OH-C10:0 and Flg22 at 3h post-treatment



3-OH-C10:0 INDUCES SYSTEMIC RESISTANCE IN A. THALIANA AGAINST B. CINEREA

2- Inoculation of leaves with a *Botrytis cinerea* conidial suspension (1.10⁵ conidia.mL⁻¹)

1- Treatment
Roots elicitation with 10 μM 3-OH-C10:0 or 1 μM Flg22 48 hours before pathogen inoculation

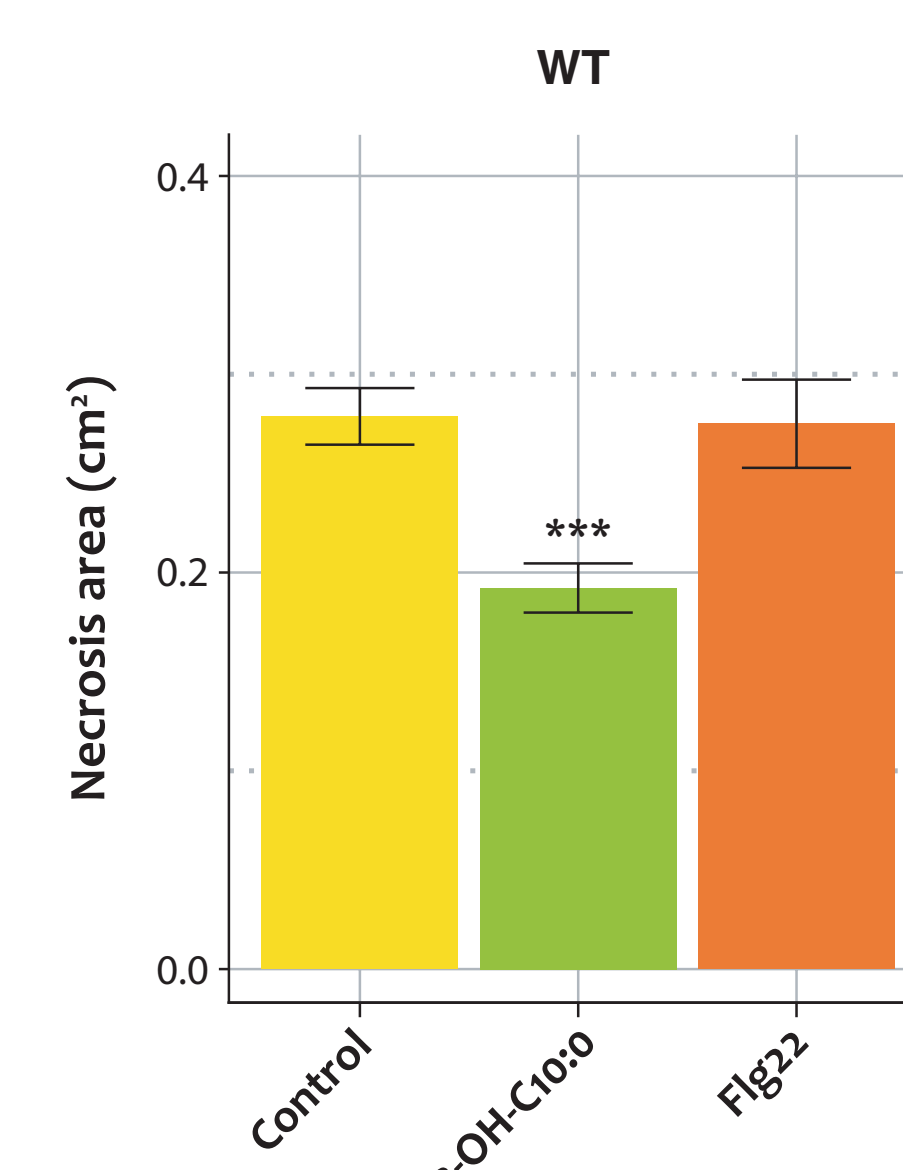


3- 72 hours after inoculation
Measurement of necrosis area



- WT plants treated with 3-OH-C10:0 showed a significant reduction on disease severity.

Interestingly, Flg22 did not showed similar ability in triggering ISR against *B. cinerea*.



CONCLUSION

The 3-OH-C10:0 perception by roots lead to a systemic resistance against *B. cinerea* in *A. thaliana* leaves and induce MAPK activation, callose deposition and induction of MTI markers genes.

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