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# Small molecules interfere with the tip-polarized growth of Arabidopsis and tomato pollen tubes

Laggoun Ferdousse<sup>1</sup>, Dardelle Flavien<sup>1,2</sup>, Falconet Denis<sup>3</sup>, Driouich Azeddine<sup>1,4</sup>, Lerouge Patrice<sup>1</sup>, Lehner Arnaud<sup>1</sup> and Mollet Jean-Claude<sup>1</sup>.

<sup>1</sup>Laboratoire Glycobiologie et Matrice Extracellulaire Végétale, EA4358, IRIB, Normandy University, University of Rouen, 76821 Mont Saint-Aignan, France.

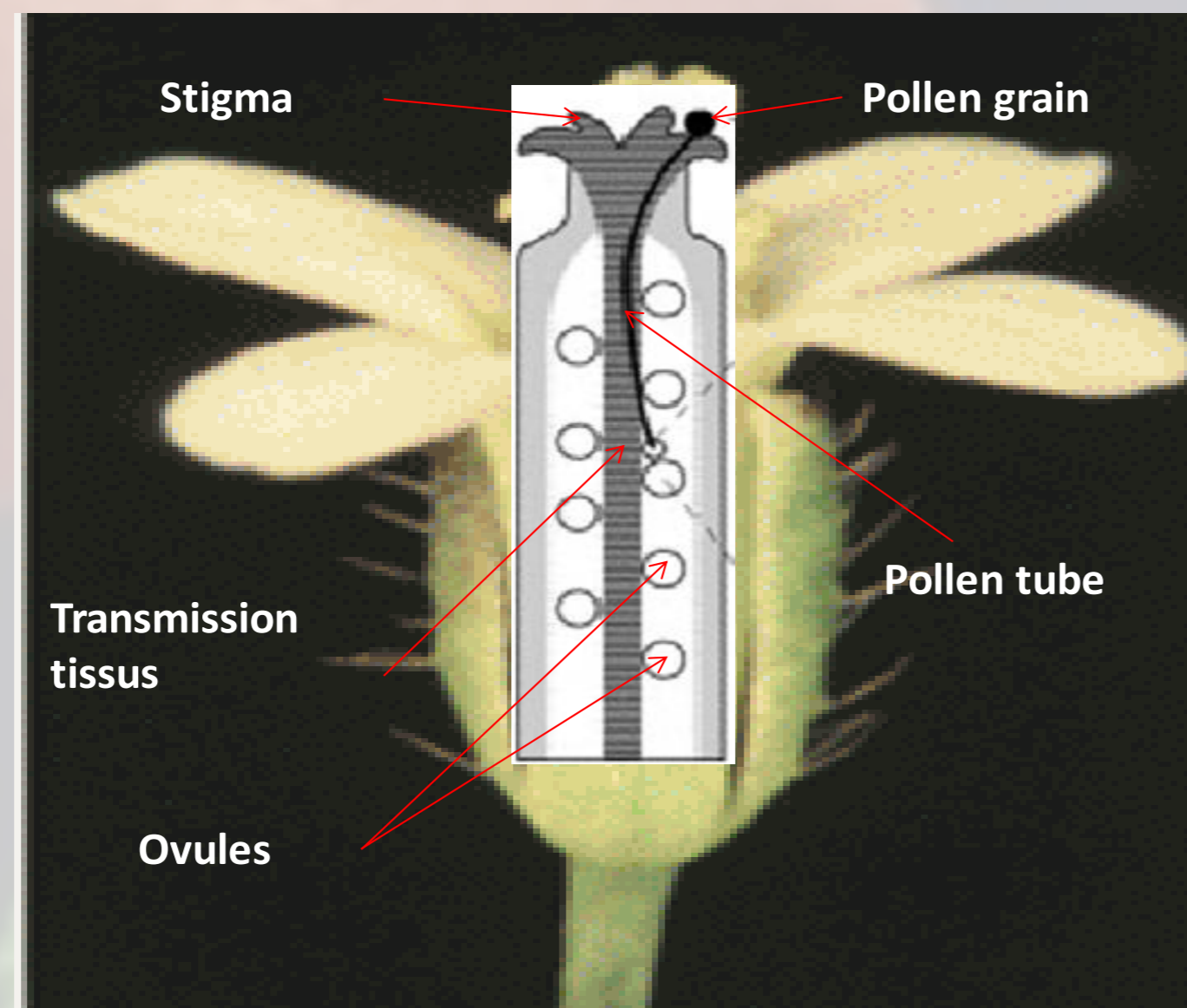
<sup>2</sup>Present address : Fitoplanton Marino, S.L. 11500 El Puerto de Santa María, Cádiz, Spain.

<sup>3</sup>Physiologie Cellulaire & Végétale (PCV), UMR 5168 - CEA - CNRS - INRA - Université Joseph Fourier, 38054 Grenoble, cedex 9, France.

<sup>4</sup>Plate-forme de Recherche en imagerie de Haute Normandie (PRIMACEN), IRIB, Normandy University, University of Rouen, 76821 Mont Saint-Aignan, France.

## I. Introduction

Sexual reproduction in land plants is of economic importance because it allows the production of seeds. The process starts when the pollen grain lands on the stigma, rehydrates and forms a pollen tube that grows through the transmission tissue and deliver the two gamete cells to the ovule.



## II. Problematic

To date, the different mechanisms that occur during the **tip-polarized growth, guidance and adhesion** of pollen tubes through the female transmission tract tissue are not well known.

## III. Aim of this work

To investigate these different mechanisms *in vitro*.

**Using a chemical screen approach**

## IV. Previous work:



Using a chemical screen on 300 small bioactive molecules originating from the CERMN (Centre d'étude et de Recherche du Médicament de Normandie)



8 compounds were selected

✓ 3 for their abilities to perturb *Arabidopsis thaliana* pollen tube growth and shape.

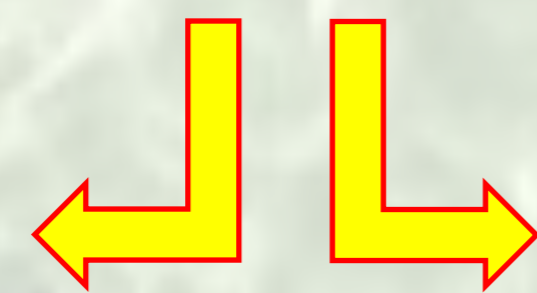
✓ 5 for their inhibiting effects on the adhesion of pollen tubes *in vitro* on a matrix composed of pectin.

## V. Materials and Methods

Flowers of *A. thaliana* and tomato (*S. lycopersicum*)



Extraction of pollen grains and culture for 6 h in a germination medium containing the molecules



1/ Evaluation of the dose dependent effect

2/ Select the concentrations to obtain a phenotype

## VI. Preliminary results

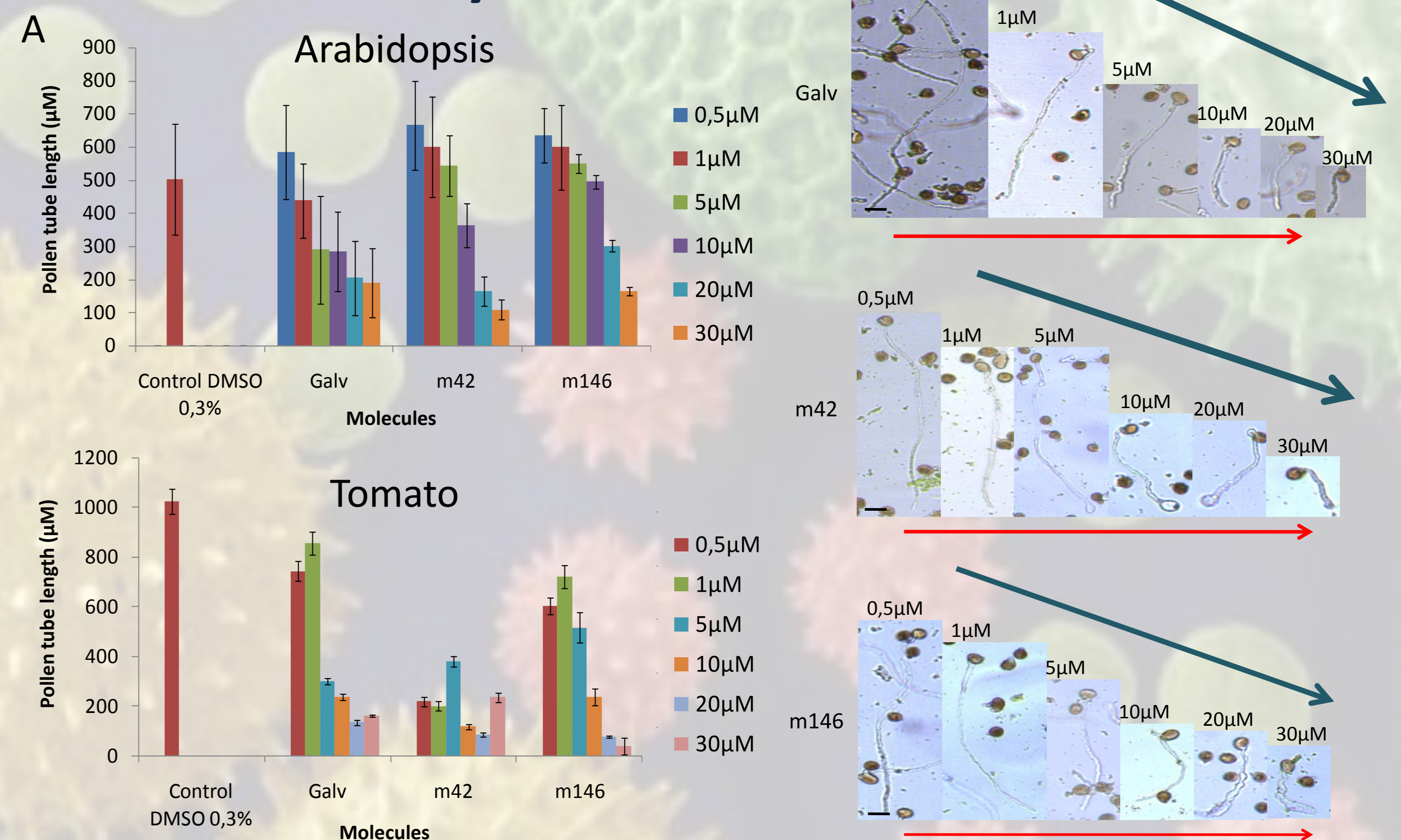


Figure 1: The dose-dependent effects of the molecules on (A) the pollen tube length and (B) phenotypes of Arabidopsis pollen tubes treated with the molecules. Red arrows : increasing concentration, blue arrow : dose-dependent effect on pollen tube length. Galv = Galvestine. Scale bar = 20 μm.

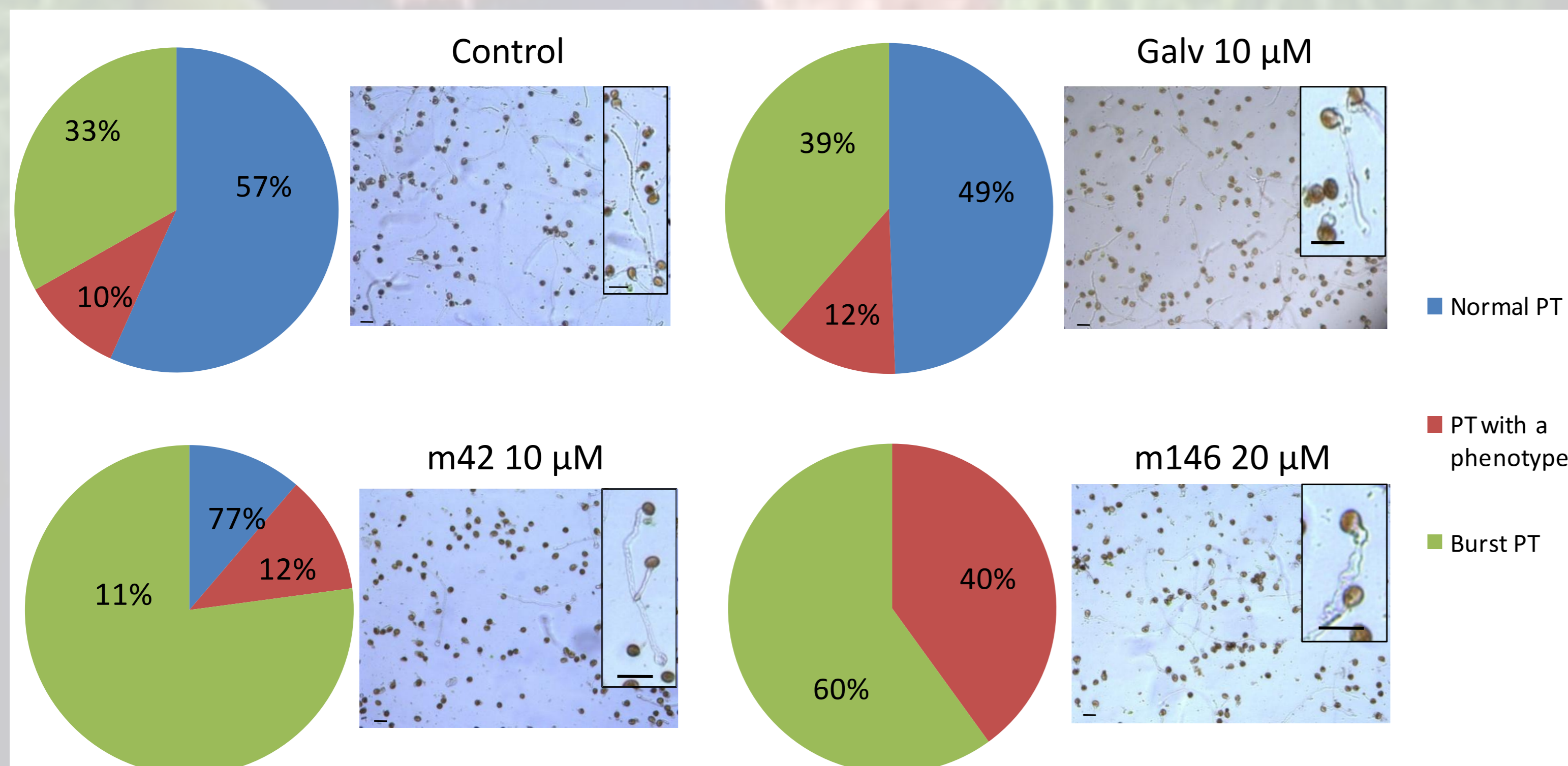


Figure 2: Ratio of the phenotypes and morphology of *A. thaliana* pollen tubes. Galv = Galvestine. PT : Pollen tube. Scale bar = 40 μm.

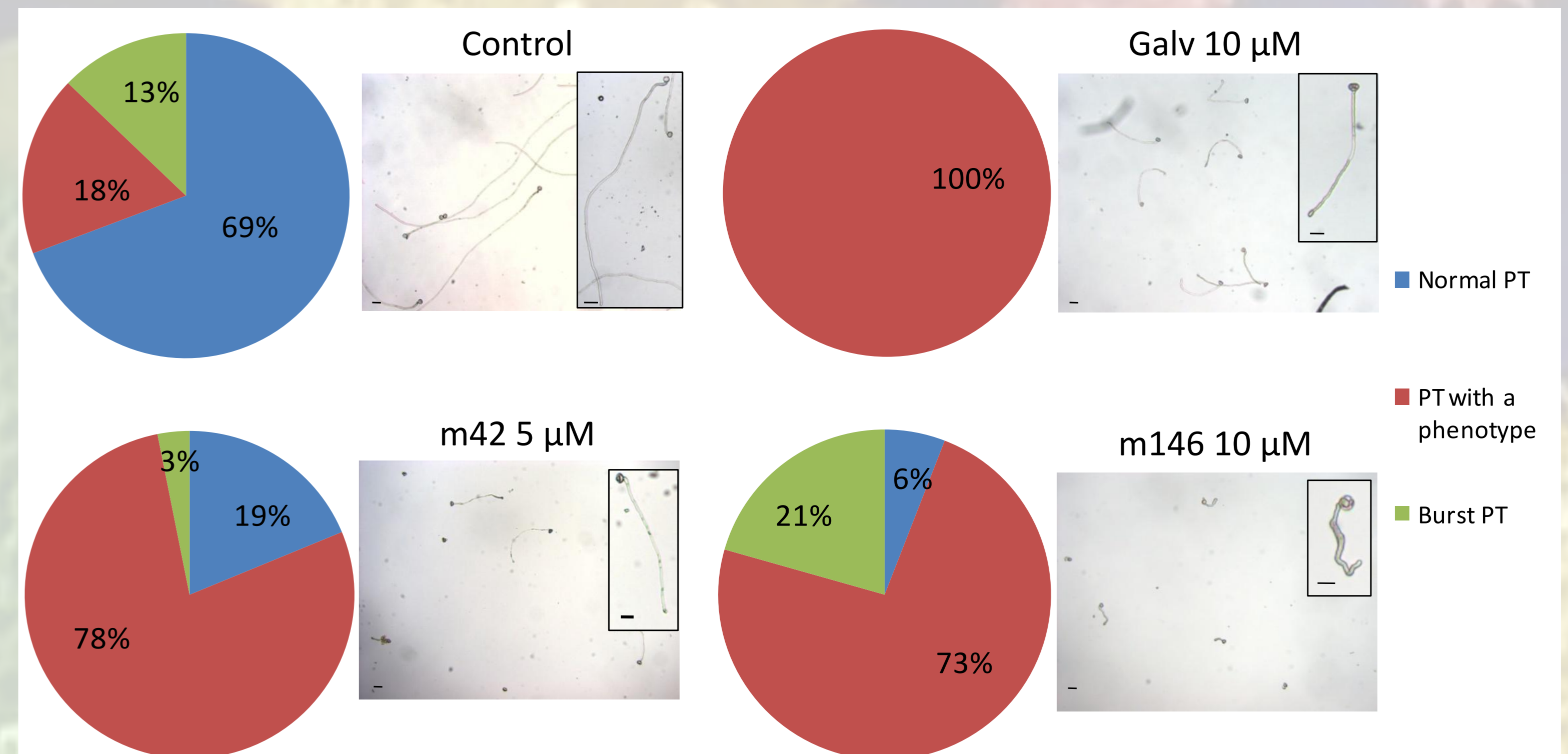


Figure 3: Ratio of phenotypes and morphology of *S. lycopersicum* (tomato) pollen tubes. Galv = Galvestine. PT : Pollen tube. Scale bar = 40 μm.

## VII. Conclusion and perspectives :

- The molecules have a dose-dependent effect on Arabidopsis and tomato pollen tubes.
- Use the selected concentrations to investigate their effects on the cell wall deposition by immuno-cytochemistry and on the cytoskeleton organization.