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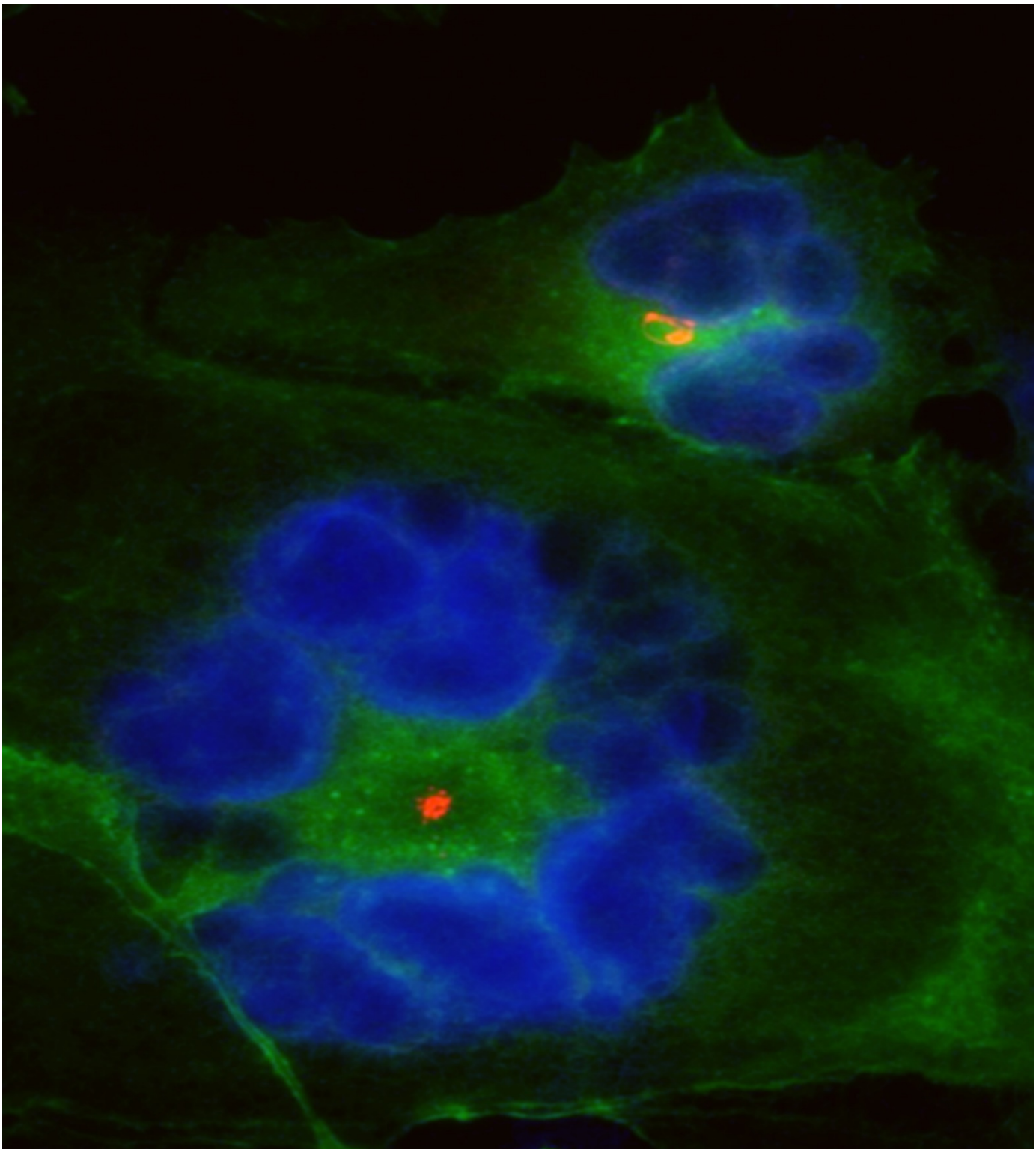

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Cover page: The Synthetic Lethal Rosette

Aberrant mitotic phenotype found in BRCA1-deficient cells treated with the PLK1 inhibitor Volasertib. Cells become giant and multinucleated and acquire a flower shape, with nuclei arranging in a circular disposition around a cluster of centrosomes. Blue (DAPI: nuclei), Green (FITC-phalloidin: actin cytoskeleton), Red (γ-Tubulin: centrosomes).

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state and directly as toxic compound against bacterial and fungal pathogens. On the other hand, exogenous treatments of healthy plants with SFN, lead to priming state, a situation of "alert" in plants against possible future attacks. Mode of action of SFN it is believed rely on its electrophile nature, that allow to react whit cellular thiols, like reduced glutathione and/or protein cysteine and histidine. While there is information about its physiological effects, as mentioned above, little is known about the signaling events that lead to SFN final responses in plants. In this work we analyze the signaling responses generated by SFN treatment on *Arabidopsis thaliana*, focus on reactive oxygen species (ROS) as well as the effect of presence of free glucose in stoichiometry amounts. It was determined that SFN induces the production of ROS and this production are enhance in the presence of glucose. Using non- metabolizable analog of this sugar, we were able to determine effect responds to glucose catabolism and not to sugar signaling mechanisms. In addition, we were able to determine that calcium participates upstream for the production of ROS, since calcium blockers and chelators reduced the ROS signal. Finally, using null mutants of *A. thaliana* in NADPHox D and F (RBOHD and RBOHF) we were able to determine that isoform D is responsible for the production of ROS in response to SFN treatment. These results together indicate that SFN induces the production of ROS in *A. thaliana* through RBOHD activity dependent of calcium.

PL-P16
STRUCTURAL AND FUNCTIONAL CHARACTERIZATION OF ORGANELLAR SMALL HEAT SHOCK PROTEINS FROM TOMATO (*SOLANUM LYCOPERSICUM*)

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Chaperones belonging to the small heat shock protein (sHSP) family are ubiquitous and exhibit high expression levels after heat and other stress conditions. In plants, these proteins are especially abundant and diverse, and localized in the cytosol as well as in almost every organellar compartment. The presence of specific sHSP in organelles seems to be exclusive to plants, with a few exceptions. In tomato fruits, the accumulation of specific sHSP was postulated to be related to the protection against chilling postharvest injury. In this work, we focused on two organellar sHSP: sHPS23.8 and sHSP21.5, which are present in the mitochondria and endoplasmic reticulum of tomato, respectively. The mature proteins were cloned, expressed and purified to homogeneity. A structural characterization to investigate their oligomeric state *in vitro* was performed. Additionally, polyclonal antibodies against specific peptides of each of these proteins were used to detect changes in their abundance in fruit of wild type and transgenic tomato plants with altered levels of each of these proteins. In this sense, extracts from mature fruit before and after cold treatment were analyzed in order to elucidate their participation in the maturation of tomato fruit and their response to cold storage. Results indicated that the level of these proteins correlated with the chilling injury of the fruit, suggesting that the regulation of the organellar sHSP would be important for the protection mechanisms against chilling stress in tomato.

PL-P17
STUDY OF POLLEN TUBE GROWTH BY RALF-MEDIATED SIGNALING WITH RECEPTOR-LIKE KINASES IN *ARABIDOPSIS THALIANA*

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In flowering plants, fertilization requires complex signal exchanges and a flawless communication between male and female reproductive tissues. This complex cell-to-cell communication that occurs in the extracellular matrix to the interior of the cell is crucial for cell's function. Receptor-like kinases (RLKs) have been implicated in various processes, including cell wall integrity, sexual reproduction, immunity and various hormone pathways. In turn, small proteins of the RAPID ALKALINIZATION FACTOR (RALF) family have been recently identified as ligands of different RLKs. RLK/RALF interaction is essential for a correct polarized growth of pollen tubes, process regulated by cytoskeletal reorganization, vesicular movement, Ca^{2+} signaling and reactive oxygen species (ROS). However, the mechanism of their perception has not been fully elucidated. Using transgenic plants that express pollen proteins followed by fluorescent proteins, we propose to study the mechanism of interactions between pollen RALFs and their respective RLKs. These results will shed light to understand the signaling pathway during pollen tube growth in *Arabidopsis thaliana*.

PL-P18