Finanziato dall'Unione europea NextGenerationEU



# Project title: Conserved regulation of plant programmed cell death in response to heat stress

### Acronym: DEATHEAT

#### **Partners:**

- IBPM-CNR: Dr. Alice Pajoro
- UniMi: Prof. Marta Mendes
- UniPisa: Prof Riccardo di Mambro

## alice.pajoro@cnr.it



#### **Description**:

Global warming is causing a reduction of crop yield threatening food security. Since most food supply are fruits/seeds or originates from root vegetables, it is crucial to understand how plants cope with heat stress (HS) in the reproductive systems and in the root. Plants have developed several strategies to tackle HS, one is the induction of programmed cell death (PCD). In *Arabidopsis thaliana*, the synergid cells (SYN), located in the female gametophyte, and the uppermost cells of the lateral root cap (ULRC) tissue in roots undergo PCD to guarantee a successful fertilization, thus production of seeds, and the correct growth of the root. Although these processes take place in opposite plant body, many PCD regulators are expressed in SYN and in ULRC, suggesting analogous PCD molecular mechanisms.

## Aims:

The project main aim is to identify the conserved molecular mechanisms that are at the basis of PCD of SYN and ULRC, in physiological and HS conditions. This discovery will be immediately translated into a species of huge agronomic and economic interest in Italy, rocket.

## **Expected results:**

DEATHEAT will generate new insights for common and conserved molecular mechanisms for developmentally regulated PCD. Moreover, DEATHEAT will increase the understanding of components influencing PCD in reproduction and root growth in response to HS in a model species and in a crop, thus cogenerating practical concepts for a translational application with an immediate impact on the agronomic level.

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