Objective

Receptor ectodomain shedding (shedding) is a fundamental mechanism of the regulation of communication between mammalian cells. Shedding refers to the proteolytic cleavage of the extracellular portion of a membrane protein. This process can inactivate the function of a receptor, generate extracellular signalling molecules and trigger the generation of intracellular protein forms involved in signalling. Shedding is best understood in mammals, with hundreds of shedding events reported, but also occurs in other animals and fungi. A few cases of shedding have been observed in plants. Membrane receptor like kinases (RLKs) constitute the main players of cell-to-cell communication in plants, with many of them serving as key immune receptors. RLK shedding has been reported in two occasions, pointing to an important regulatory function. Despite the essential functions of shedding in animals,
the biological significance of RLK shedding in plants, and the fact that plant cells harbour many more receptors than their animal counterparts, shedding has yet to be studied systematically in plants. By reanalysis of large scale extracellular proteome datasets, I found evidence of widespread RLK shedding events in plants. However, this analysis could not reveal exact cleavage sites that are important for follow up functional studies. Through RESIST, I seek to develop this new field of ectodomain shedding in plant biology and study the mechanisms of regulation and the consequences of plant RLK shedding. To do so, I aim to establish a platform for experimental identification of shedding events in plants by adapting cutting edge methods recently developed in medical sciences for precise identification of processed membrane proteins and released ectodomains in Nicotiana benthamiana. I will use this platform to analyse the plant sheddome (the repertoire of shed proteins) and its dynamics upon defence activation and to identify interesting shedding events for functional characterization.

**Fields of science**

natural sciences > biological sciences > biochemistry > biomolecules > proteins > proteomics
natural sciences > biological sciences > microbiology > mycology
natural sciences > biological sciences > zoology > mammalogy
medical and health sciences

**Keywords**

Nicotiana benthamiana  ectodomain shedding  Receptor like Kinase  terminomics

plant

**Programme(s)**

HORIZON.1.2 - Marie Skłodowska-Curie Actions (MSCA)  MAIN PROGRAMME

**Topic(s)**

HORIZON-MSCA-2021-PF-01-01 - MSCA Postdoctoral Fellowships 2021

**Call for proposal**
See other projects for this call

Funding Scheme

HORIZON-TMA-MSCA-PF-EF - HORIZON TMA MSCA Postdoctoral Fellowships - European Fellowships

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Links

Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

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