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Titolo	How Can Secretomics Help Unravel the Secrets of Plant-Microbe Interactions?
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Descrizione fisica	1 online resource (188 p.)
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Sommario/riassunto	Secretomics describes the global study of proteins that are secreted by a cell, a tissue or an organism, and has recently emerged as a field for which interest is rapidly growing. The term secretome was first coined at the turn of the millennium and was defined to comprise not only the native secreted proteins released into the extracellular space but also

the components of machineries for protein secretion. Two secretory pathways have been described in fungi: i) the canonical pathway through which proteins bearing a N-terminal peptide signal can traverse the endoplasmic reticulum and Golgi apparatus, and ii) the unconventional pathway for proteins lacking a peptide signal. Protein secretion systems are more diverse in bacteria, in which types I to VII pathways as well as Sec or two-arginine (Tat) pathways have been described. In oomycete species, effectors are mostly small proteins containing an N-terminal signal peptide for secretion and additional C-terminal motifs such as RXLRs and CRNs for host targeting. It has recently been shown that oomycetes exploit non-conventional secretion mechanisms to transfer certain proteins to the extracellular environment. Other non-classical secretion systems involved in plant-fugal interaction include extracellular vesicles (EVs, Figure 1 from Samuel et al 2016 Front. Plant Sci. 6:766.). The versatility of oomycetes, fungi and bacteria allows them to associate with plants in many ways depending on whether they are biotroph, hemibiotroph, necrotroph, or saprotroph. When interacting with a live organism, a microbe will invade its plant host and manipulate its metabolisms either detrimentally if it is a pathogen or beneficially if it is a symbiote. Deciphering secretomes became a crucial biological question when an increasing body of evidence indicated that secreted proteins were the main effectors initiating interactions, whether of pathogenic or symbiotic nature, between microbes and their plant hosts. Secretomics may help to contribute to the global food security and to the ecosystem sustainability by addressing issues in i) plant biosecurity, with the design of crops resistant to pathogens, ii) crop yield enhancement, for example driven by arbuscular mycorrhizal fungi helping plant hosts utilise phosphate from the soil hence increase biomass, and iii) renewable energy, through the identification of microbial enzymes able to augment the bio-conversion of plant lignocellulosic materials for the production of second generation biofuels that do not compete with food production. To this day, more than a hundred secretomics studies have been published on all taxa and the number of publications is increasing steadily. Secretory pathways have been described in various species of microbes and/or their plant hosts, yet the functions of proteins secreted outside the cell remain to be fully grasped. This Research Topic aims at discussing how secretomics can assist the scientists in gaining knowledge about the mechanisms underpinning plant-microbe interactions.