Proposition d'un sujet de stage au M2 ADAM (2017-2018)

Titre	**Study of peptides secreted by symbiotic and pathogenic fungi**
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Résumé	*Biological context:* Most plants are associated with symbiotic fungi beneficial for their growth, the arbuscular mycorrhizal (AM) fungi. This widespread association involves an exchange of nutrients: in exchange for sugars provided by the plant, the fungus brings to its host water and minerals, thus improving its nutrition and growth. The study of this ancient symbiosis can lead to promote the use of AM fungi in sustainable agriculture and thus reduce the need for irrigation and chemical inputs. Our main objective is to study the cellular and molecular mechanisms involved in the establishment of the symbiosis: from spore germination to the formation of arbuscules. We contributed to the discovery of important molecular signals produced by plant roots, the strigolactones (Besserer et al. 2006; Gomez-Roldan et al. 2008) and by the AM fungi, the Myc-LCO / CO (Maillet et al. 2011; Genre et al. 2013). We have recently characterized fungal peptides presenting activities on the fungus, thus promoting mycorrhization. In sillico analyses also revealed the presence of interesting peptides in plant pathogens. *Training offer:* We would like to search for the production of peptides by symbiotic AM fungi but also by pathogenic fungi to describe the occurrence of these peptides. Then we would like to evaluate the activity of these peptides on the host plant or the fungus itself. Finally, we would like to inhibit or compete these activities using modified or truncated peptides. The candidate will first have to realize the fungal cultures, and will help in the detection of these peptides by mass spectrometry. Then, different approaches will be developed to understand the role of the peptides produced by these fungi, through mycorrhization assays or patho-assays.

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