



HAL
open science

When foes become friends: a *Colletotrichum* endophyte that enhances plant growth

Richard O'Connell

► **To cite this version:**

Richard O'Connell. When foes become friends: a *Colletotrichum* endophyte that enhances plant growth. SFB seminar series of Martin-Luther-Universität Halle-Wittenberg, May 2016, Halle, Germany. hal-02795072

HAL Id: hal-02795072

<https://hal.inrae.fr/hal-02795072>

Submitted on 5 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

When foes become friends: a *Colletotrichum* endophyte that enhances plant growth

Richard O'CONNELL

BIOGER, INRA, AgroParisTech, Thiverval-Grignon, France

A staggering diversity of endophytic fungi associate with healthy plants in nature, but it is usually unclear whether these represent stochastic encounters or provide host fitness benefits. Although most characterized species of the fungal genus *Colletotrichum* are destructive pathogens, we show here that *C. tofieldiae* (*Ct*) is an endemic endophyte in natural *Arabidopsis thaliana* populations in central Spain. Colonization by *Ct* initiates in roots but can also spread systemically into shoots. *Ct* transfers the macronutrient phosphorus to shoots, promotes plant growth, and increases fertility only under phosphorus-deficient conditions, a nutrient status that might have facilitated the transition from pathogenic to beneficial lifestyles. The host's phosphate starvation response (PSR) system controls *Ct* root colonization and is needed for plant growth promotion (PGP). PGP also requires PEN2-dependent indole glucosinolate metabolism, a component of innate immune responses, indicating a functional link between innate immunity and the PSR system during beneficial interactions with *Ct*.