BURKHOLDERIA SSP. IN SUGARCANE CROP: THE CONUNDRUM OF ANTIFUGAL PRODUCTION INTRINSIC ANTIMICROBIAL RESISTANCE AND PEST CONTROL

PRINCIPAL INVESTIGATORS

WELINGTON LUIZ DE ARAUJO
Institute of Biomedical Sciences /
University of São Paulo (USP)
MIGUEL VALVANO
Queen's University of Belfast

ABOUT THE PROJECT

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CONTACT

✉ wlaraujo@usp.br

Burkholderia spp. is the main component of the sugarcane cultivable bacterial community. Members of this genus produce antifungal compounds and serve to phytopathogens control and plant growth promotion. However, *Burkholderia cepacia* complex (Bcc) are described as potential opportunistic agents of pulmonary infection and present intrinsic antimicrobial (iAMR) against different classes of antibiotics including antimicrobial peptides. iAMR is multifactorial and we have shown that production of hopanoids, polyamines and modifications of cell surface polysaccharides provide high-Level resistance, and increased bacterial virulence in the *Galleria mellonella* (Lepdoptera: Pyralidae) infection model. However, the relationship between iAMR and antifungal production is not established, but our previous results have shown that strains with high-Level antimicrobial resistance display higher capacity to inhibit pathogenic fungi. Thus, this proposal will explore a hypothesis that antifungal production triggers iAMR by influencing the production of membrane hopanoids and polyamines, and modification of cell surface polysaccharides. Our first aim will evaluate in *Burkholderia spp.* the relationship between the organization and expression of hopanoid genes cluster, iAMR and antifungal production. Also, we will evaluate the organization and expression of capsule and lipopolysaccharide gene clusters in Burkholderia spp. in relation to iAMR and the antifungal synthesis, as well as the expression of polyamine genes. Since we have observed that *B. seminalis* displays high virulence in the *G. mellonella*, our second aim will evaluate *B. seminalis* as a pest biocontrol agent against *Diatraea saccharalis* (Lepdoptera: Crambidae), a major pest for sugarcane. This proposal will address underpinning mechanisms associated to antifungal production and iAMR, and will enable us to translate this information into a practical biocontrol approaches.