

# Effect of commercially available Plant Defence Stimulators (PDS) on human innate immunity

## Day 1: Innate Immunity Interactions with Pathogens (10/11/2014)

Lény TEYSSIER<sup>a,c</sup>, Stéphanie DELEMASURE-CHALUMEAU<sup>b</sup>, Patrick DUTARTRE<sup>b</sup>, David WENDEHENNE<sup>c</sup>,

Olivier LAMOTTE<sup>c</sup>, Jean-Louis CONNAT<sup>a,b</sup>

*a: INSERM U866 Lipide Nutrition Cancer, Université de Bourgogne, LPPCM, Facultés de Médecine et Pharmacie, 7 Bd Jeanne d'Arc, 21079 Dijon Cedex*

*b: COHIRO Biotechnology, UFR de Médecine de Dijon, Facultés de Médecine et Pharmacie, 7 Bd Jeanne d'Arc, BP 87900, 21079 Dijon Cedex*

*c: CNRS UMR 1347 Agroécologie, NO et réponse de défense des plantes, 17 Rue Sully, 21000 Dijon*

PDS (Plant defence stimulators) constitute a recent alternative to pesticides used for crop protection. These compounds called elicitors are of diverse nature, but they all act by stimulating innate immune system of plants. So, plants can better fight pathogens. Furthermore, there are many similarities in pathogen perception systems and cellular signalling in plants and animals. It is well established that many elicitors stimulate both human and plant innate immunity (Zipfel and Felix, 2005). Therefore, it is likely that human innate immunity could be modulated by PDS. The aim of this study is to evaluate pro/anti-inflammatory activity of five different commercially available PDS on human cell models.

We studied the pro/anti-inflammatory effect of PDS (Bion® 50WG, Stifenia...) on human peripheral blood mononuclear cells (PBMC). These cells are exposed during twenty hours to various concentrations of PDS or their corresponding active molecules. Pro-inflammatory action is evaluated by measuring the quantity of the inflammatory cytokine IL-1 $\beta$  in the cells supernatants using ELISA test. To study anti-inflammatory effect, we used PBMC treated with LPS to trigger a basal inflammatory response. We then checked if PDS delivered at the same time as LPS modified IL-1 $\beta$  production. In addition, in all the experiments, the viability is evaluated with a XTT test.

PDS, which were however used at equal or lower concentrations than in the fields, show different profiles in terms of cytotoxicity and inflammatory modulation. For example, Stifenia was slightly cytotoxic at 1 mg/ml and pro-inflammatory at 0,3 and 1 mg/ml concentrations. Conversely, Bion® 50WG at dosages from 0,3 mg/ml dose-dependently inhibited IL-1 $\beta$  production and proved to be anti-inflammatory. Interestingly, some active molecules have not the same inflammatory profile than their respective formulated PDS from the market.

Our results indicate that PDS can differently interact with human innate immunity. We hope to use these particularities to better understand the innate immunity pathways that could be common in plants and animals.