



HAL
open science

Molecular phenotyping of intestinal epithelial cells exposed to mycotoxins

Laura Soler, Valérie Labas, Ana-Paula Teixeira-Mechin, Charles Banliat,
Tarek Lahjouji, Chloé Terciolo, Manon Neves, Isabelle P. Oswald, Philippe
Pinton

► **To cite this version:**

Laura Soler, Valérie Labas, Ana-Paula Teixeira-Mechin, Charles Banliat, Tarek Lahjouji, et al.. Molecular phenotyping of intestinal epithelial cells exposed to mycotoxins. 34. Réunion annuelle du Club d'Etudes des Cellules Epithéliales Digestives (CECED), Mar 2019, Toulouse, France. hal-02791539

HAL Id: hal-02791539

<https://hal.inrae.fr/hal-02791539v1>

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.

Molecular phenotyping of intestinal epithelial cells exposed to mycotoxins

SOLER VASCO, Laura¹ ; LABAS Valérie²⁻³ ; TEIXEIRA-GOMES Ana Paula³⁻⁴ ; BANLIAT Charles²⁻³ ; LAHJOUJI Tarek¹ ; PINTON Philippe¹ ; TERCIOLO Chloé¹ ; NEVES, Manon¹ ; OSWALD Isabelle¹

¹Biosynthesis & Toxicity of Mycotoxins; UMR 1331 Toxalim, INRA Toulouse 180, chemin de Tournefeuille - 31027 Toulouse, France

² UMR PRC, INRA 85, CNRS 7247, Université de Tours, IFCE, 37380 Nouzilly, France

³ CIRE, Pôle d'Analyse et d'Imagerie des Biomolécules, INRA, CHRU de Tours, Université de Tours, 37380 Nouzilly, France.

⁴ UMR ISP, INRA 1282, Université de Tours, 37380 Nouzilly, France

Introduction: Mycotoxins are natural food contaminants that display a wide variety of toxic effects (cytotoxic, genotoxic, endocrine disruption, ...). Characterization of their toxicity is hence cumbersome, so the development of high-throughput, comprehensive tools to depict their toxicity is needed. One possibility would be the use of the molecular profiling methodology ICM-MS (Intact Cell MALDI-TOF Mass Spectrometry). This technique is based on the acquisition of MS profiles from whole cells. An ICM-MS profile represents a specific molecular cell phenotype, which can be later combined in machine-learning algorithms for the construction of diagnostic/predictive models. Our hypothesis is that the ICM-MS profiles of cells exposed to characterized, known mycotoxins could be used to build a toxicity-predictive model, that could be valuable for toxicity screening of uncharacterized mycotoxins, toxin combinations, etc. Our **objective** was to verify if the ICM-MS profile of intestinal cells exposed to known mycotoxins was toxin-specific as a first step to test the potentiality of this technique applied to toxicological screening. The **methodology** followed involved a short exposition of differentiated Caco-2 cells to low concentrations of several mycotoxins (deoxynivalenol, zearalenone, aflatoxin-B1, Fumonisin-B1, patulin, ochratoxin-A). Cells were then analyzed using ICM-MS and profiles were compared. **Results** showed that ICM-MS intestinal cells phenotyping was specific enough to differentiate the response to different mycotoxins, with cross-validation and recognition values higher than 80%. The molecular phenotype changed in response to concentration changes and different exposition times. In **conclusion**, ICM-MS shows a promising potential to become a toxicity screening tool.

Acknowledgements: Authors would like to express their gratitude to the Animal Health Department from INRA for their financial support (AP2017-DeptSA).