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PR toxin toxicity on human cells: An *in vitro* study

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PR toxin is a mycotoxin produced by *Penicillium roqueforti* that can be found in grains and silage contaminated by this fungal species. It can also be detected in contaminated cheeses however it is not considered to be stable in the case of blue cheese, where this species plays an important technological role. This mycotoxin can be absorbed by humans or animals from contaminated foods and is considered to be the most toxic mycotoxin produced by *P. roqueforti*. PR toxin toxicity was already studied in rats and mice however, there is a lack data related to humans. In this study, intestinal cell lines (Caco-2) representing the first barrier after ingestion and immune cells (THP-1) were exposed to different PR toxin concentrations ($1.25 \cdot 10^{-9}$ to $1.25 \cdot 10^{-6}$ M) for 48 hours. Only 10% mortality was observed for Caco-2 cells for the highest tested concentration. For THP-1 cells the IC50 was determined to be $8.3 \cdot 10^{-7}$ M after 48 hours exposition. Toxicity showed high necrosis (70% cell population) after 3 hours exposition in the presence of $1.25 \cdot 10^{-5}$ M PR toxin while at $1.25 \cdot 10^{-7}$ M PR toxin, only 5% of cells were necrotic. Differential expression of 3 genes coding for inflammatory cytokines (TNF α , IL8 et IL-1 β) involved in immune responses were studied and variations were observed after 6 hours exposure to $6.25 \cdot 10^{-7}$ M PR toxin in comparison to untreated cells. The highest expression levels were observed for the TNF α related gene after 24 hours exposure. In conclusion PR toxin activates the expression of 3 pro-inflammatory cytokines leading to inflammation and THP-1 cell necrosis.

Biography

Monika Coton has obtained her PhD from the University of Caen Basse-Normandiein, France, where she was trained as a Molecular Microbiologist. Since 2011, she works as an Assistant Professor at the Université de Bretagne Occidentale and teaches Food Processing Technologies, Food Microbiology and Biotechnology at the "Ecole Supérieure d' Ingénieurs Agro-alimentaires de Bretagneatlantique" (ESIAB). Her research mainly focuses on the structural and functional diversity of filamentous fungi in fermented food products (dairy, beverages etc) in the "Laboratoire Universitaire de Biodiversitéet' Ecologie Microbienne" (Brittany, France). She has published more than 40 papers in reputed journals.

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