Saccharomyces boulardii strain CNCM I-745 shows protective effects against *B. anthracis* LT toxin

Pontier-Bres Rodolphe [3], Rampal Patrick[3], Peyron Jean-François[2], Lemichez Emmanuel[1], Czerucka Dorota[3].

(1) Equipe 6, (2) Equipe 4, INSERM U 1065, Centre Meditérranéen de Médecine Moléculaire, C3M , Hôpital de l'Archet, Nice, France. (3) Centre Scientifique de Monaco, Monaco,
dczerucka@centrescientifique.mc

INTRODUCTION:

- ***Bacillus anthracis* LT-toxin** has been directly implicated in epithelia and endothelia barrier dysfunction observed in the gastrointestinal form of the disease. It is composed of the PA binding sub-units and LF the catalytic sub-units. Massive reorganization of the actin cytoskeleton promoted by LT through MEK inhibition is a great system to study inhibitors of the intoxication process.
- The probiotic yeast ***Saccharomyces boulardii* CNCM I-745** (*S.b*) is prescribed worldwide for prophylaxis and treatment of diarrheal diseases caused by bacteria, virus or antibiotics. Several studies have shown that *S. b.* exerts a anti-bacterial toxin effect while maintaining the barrier function of intestinal epithelium.

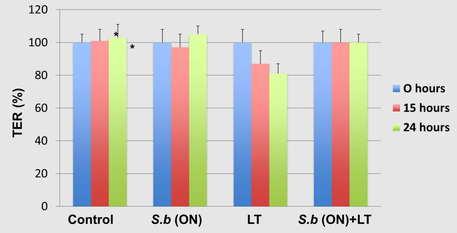
METHOD:

The study was performed on filter grown polarized T84 human colonic cell line or non-polarized human umbilical vein endothelial cells (HUVEC). Permeability was measured by trans-epithelial resistance (TER). The modifications in the distribution of the tight junctions associated protein ZO-1, and reorganization of actin cytoskeleton were monitored by confocal microscopy. MEK-2 cleavage and PA degradation were detected by western-blot.

AIM: In this study we tested whether *S.b* might confer protective effect on cell intoxication by *B. anthracis* LT-toxin.

RESULTS

FIGURE 1: *S.b* blocks LT-induced reduction in TER and maintains the tight-junction structure in T84 cells.



Anti-ZO-1

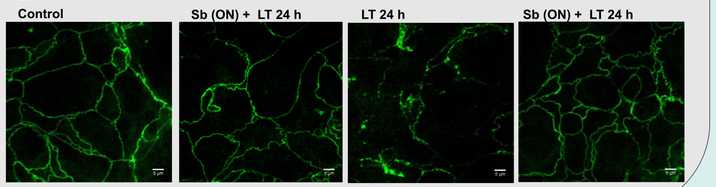
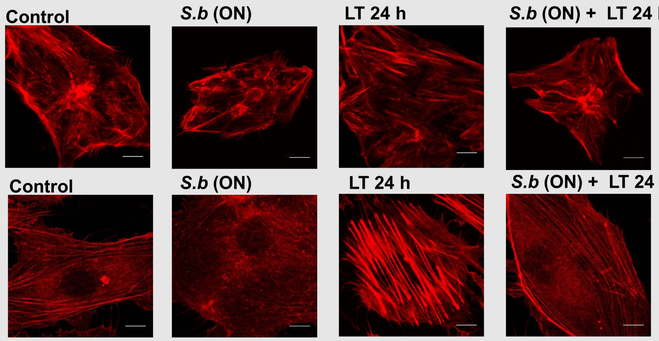


FIGURE 2: *S.b* protects against cell intoxication by LT



Actin was labelled using TRITC-labelled phalloidin

FIGURE 3: *S.b* partially blocks LT-induced MEK-2 cleavage

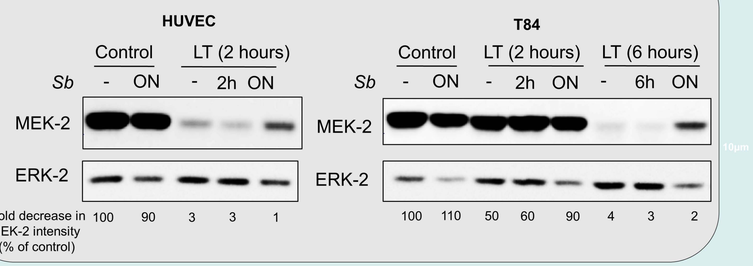
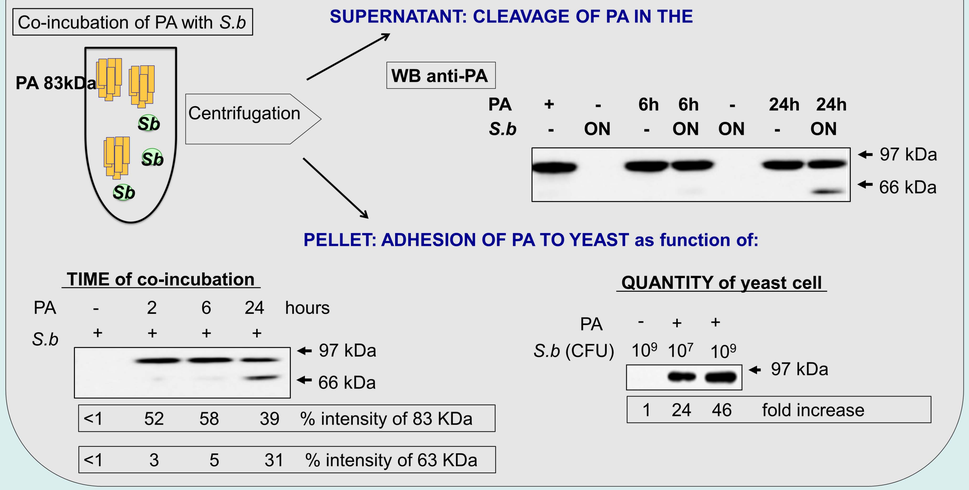


FIGURE 4: Interaction between *S.b* and PA



CONCLUSIONS:

We show that *S.b* CNCM I-745 protect against LT intoxication :

- by inducing cleavage of PA
- by adhesion of PA to yeast cell wall.

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