

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

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Financial disclosure: this study was supported by BIOCODEX SA.

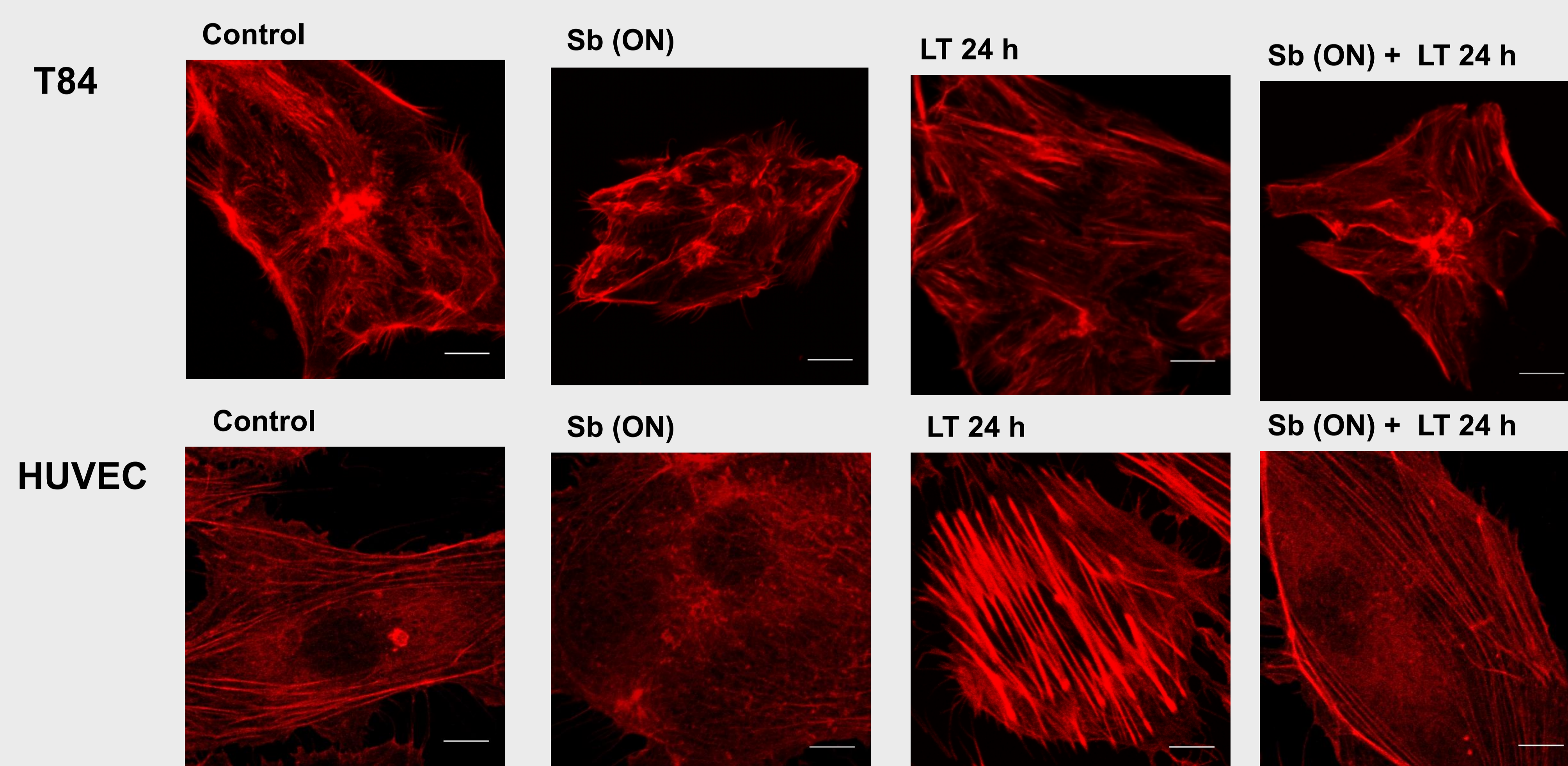
INTRODUCTION:

- Anthrax** disease is a severe bacterial infection often characterized by both septicemia and toxemia. Toxemia depends on a tripartite toxin secretion. LT toxin, composed of the PA binding sub-units and LF catalytic unit, has been directly implicated in epithelia and endothelia barrier dysfunction observed in the gastrointestinal form of the disease. 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 proteolytic effect on several bacterial toxins while maintaining the barrier function of intestinal epithelium.

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

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 junction 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.

FIGURE 1: S.b protects against cell intoxication by LT



Actin was labelled using TRITC-labelled phalloidin

RESULTS

FIGURE 3: S.b protective effects on LT-induced MEK-2 cleavage

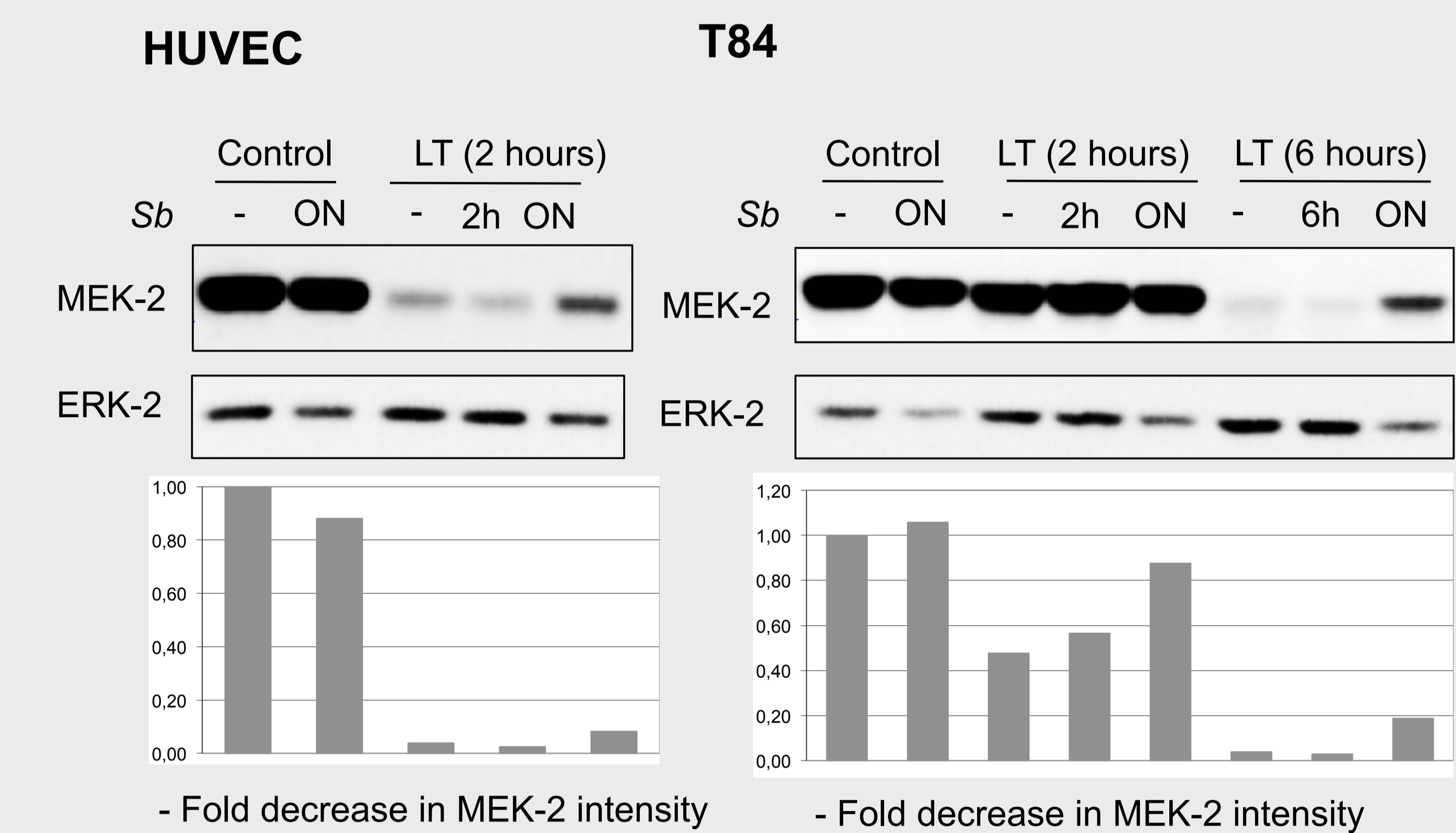


FIGURE 2: S.b blocks LT-induced reduction in TER and maintains the tight-junction structure in T84 cells.

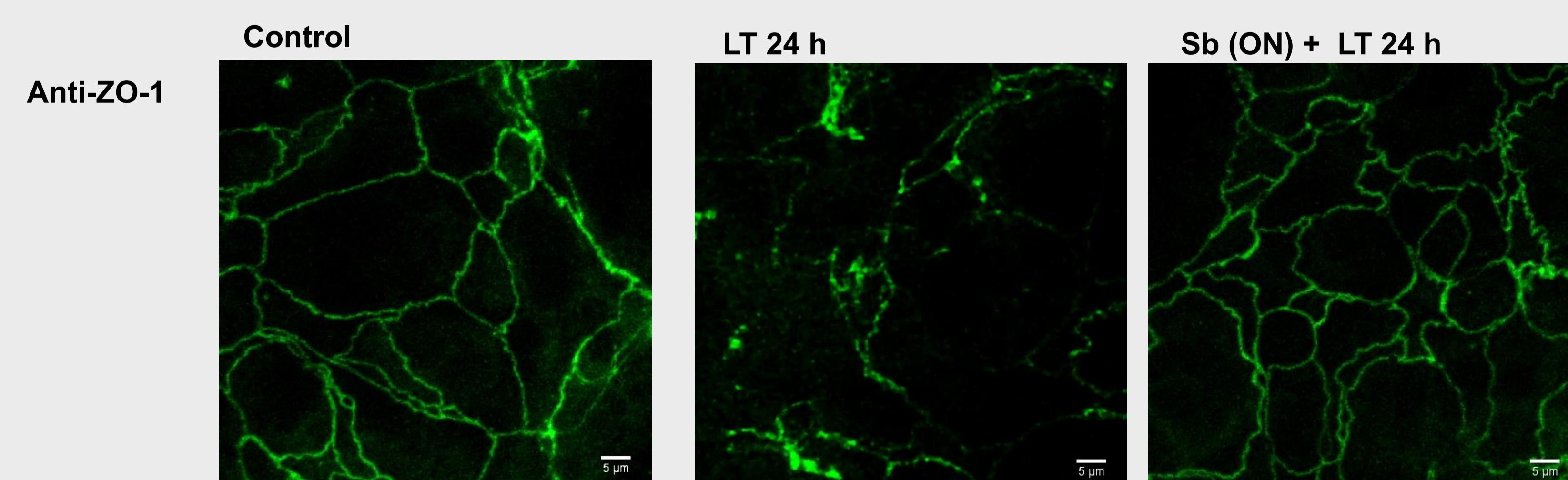
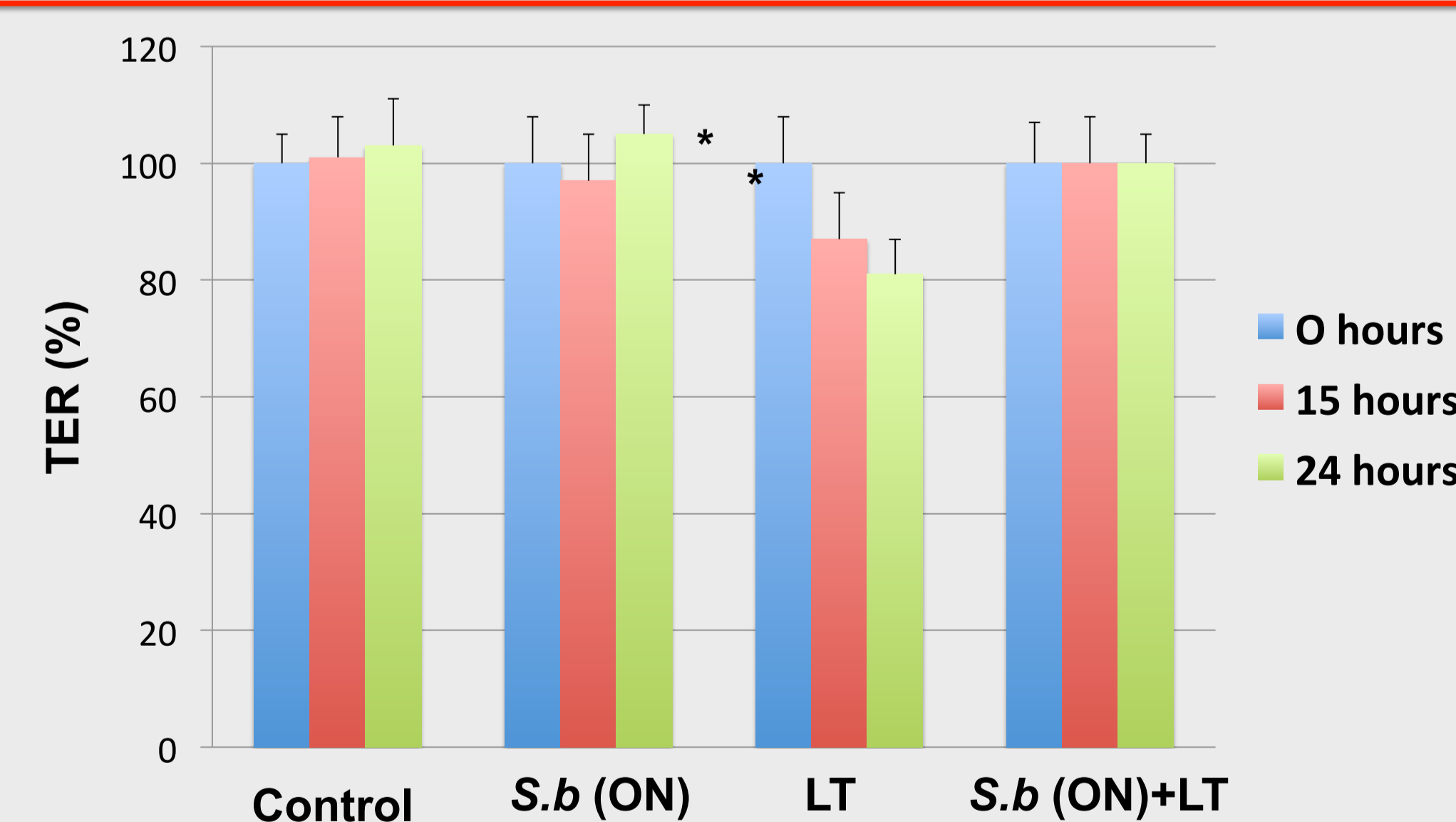
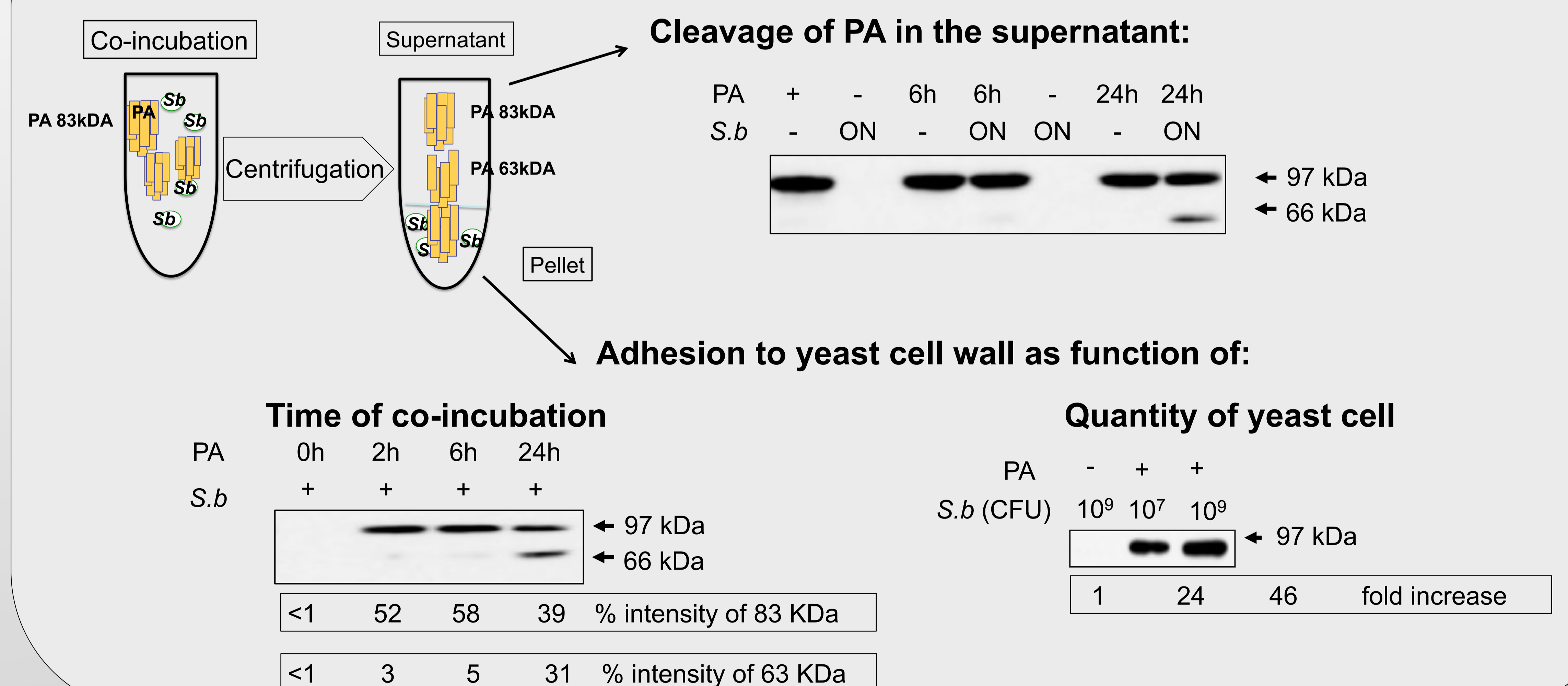


FIGURE 4: Interaction between S.b and PA



CONCLUSION: Our study highlights the potential of *S.boulardii* strain CNCM I-745 to be used as prophylactic agent against the gastrointestinal form of *B. anthracis* infection.

