

## P55 – *Akkermansia muciniphila*, a commensal of intestinal microbiota, protects from enteropathogenic *Escherichia coli* infection in the *Galleria mellonella* host-model

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**Abstract:** Probiotics are "live microorganisms that, when administered in adequate amounts confer a health benefit on the host" (1). The use of probiotics as *Lactobacillus* and *Bifidobacteria* strains, in health-promoting and immunomodulatory properties to maintain a healthy intestinal function is well documented (2). However, a more in-depth study of microbiotas in both humans and animals will most likely lead to the identification of new probiotics (3). *Akkermansia muciniphila* is recently proposed bacteria as new functional microbes with probiotic properties. *Akkermansia muciniphila* is a gram-negative a mucin-degrading member of the intestinal microbiota present in infants, adults, and the elderly both human and other mammalian species (4;5). The screening for new probiotic potentials is usually conducted using mammalian models, however, over the last years, the alternative models adopting other species such as insects have become popular due to the ethical considerations, the high costs and the time required for the authorisation of mammalian studies. *Galleria Mellonella* is widely proposed to study the pathogenesis, virulence mechanisms, immune response but also in the probiotic research (3;6). Since one of the characteristics of probiotic strains is protection from pathogens, in the present study, we wanted to investigate if *Akkermansia muciniphila* can protect the *Galleria mellonella* larvae from enteropathogenic infections *Escherichia coli*.

**Methodology:** The bacterial strains used in this study are *Akkermansia muciniphila* DSMZ 22959 and *Escherichia coli* ATCC 11775. The *G. mellonella* larvae were inoculated with 10 µL of *A. muciniphila* at the concentration of  $1 \times 10^5$  CFU/mL (not pathogenic dose for larvae). After two hours the first one inoculum, the larvae were infected by injection with 10 µL of *E. coli* suspension at the concentration of  $1 \times 10^5$  CFU/mL. After infection, the larvae were incubated in a Petri dish at 37°C and Health Index Scoring System was determined in the following 24 hours.

**Results:** We found that the injection of  $10^3$  cells/larvae of *A. muciniphila* into *G. mellonella* larvae infected by *E. coli* increased significantly the survival of these insects compared to the control group.

**Conclusion:** Susceptibility to pathogenic infections is closely related to the state of the intestinal barrier (7). As numerous studies (8;9) have shown that *A. muciniphila* plays an essential role in the maintenance of a good state of health this barrier, we have tested its action on enteropathogenic *E. coli*. In this preliminary study, we have demonstrated the protective action of *A. muciniphila* against *E. coli* using the alternative model *Galleria mellonella*.

### References

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