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**A comparative characterization of different host-sourced *Lactobacillus ruminis* strains and their adhesive, inhibitory, and immunomodulatory functions**Xia Yu, Silja Ävall-Jääskeläinen, Joanna Koort, Agneta Lindholm, Johanna Rintahaka, Ingemar von Ossowski, Airi Palva and Ulla Hynönen  
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*Lactobacillus ruminis*, an autochthonous member of the gastrointestinal microbiota of humans and many animals, is a less characterized but interesting species for many reasons, including its intestinal prevalence and possible positive roles in host-microbe crosstalk. In this study, we isolated a novel *L. ruminis* strain (GRL1172) from porcine feces and analyzed its functional characteristics and niche adaptation factors in parallel with those of three other *L. ruminis* strains (a human isolate, ATCC 25644, and two bovine isolates, ATCC 27780 and ATCC 27781). All the strains adhered to fibronectin, type I collagen, and human colorectal adenocarcinoma cells (HT-29), but poorly to type IV collagen, porcine intestinal epithelial cells (IPEC-1), and human colon adenocarcinoma cells (Caco-2). In competition assays, all the strains were able to inhibit the adhesion of *Yersinia enterocolitica* and enterotoxigenic *Escherichia coli* (ETEC, F4<sup>+</sup>) to fibronectin, type I collagen, IPEC-1, and Caco-2 cells, and the inhibition rates tended to be higher than in exclusion assays. The culture supernatants of the tested strains inhibited the growth of six selected pathogens to varying extents. The inhibition was solely based on the low pH resulting from acid production during growth. All four *L. ruminis* strains supported the barrier function maintenance of Caco-2 cells, as shown by the modest increase in transepithelial electrical resistance and the prevention of dextran diffusion during co-incubation. However, the strains could not prevent the barrier damage caused by ETEC in the Caco-2 cell model. All the tested strains and their culture supernatants were able to provoke Toll-like receptor (TLR) 2-mediated NF- $\kappa$ B activation and IL-8 production *in vitro* to varying degrees. The induction of TLR5 signaling revealed that flagella were expressed by all the tested strains, but to different extents. Flagella and pili were observed by electron microscopy on the newly isolated strain GRL1172.

**Biography**

Xia Yu is a PhD student from the University of Helsinki, Finland. Currently, she is working on her thesis and will defend the thesis at the end of 2017. She was awarded scholarships by the China Scholarship Council from 2012-2016, Finnish Veterinary Foundation during 2013-2017, and University of Helsinki from 2016-2017. She made poster presentations at several international conferences and an international course, including 11<sup>th</sup> International Symposium on Lactic Acid Bacteria, 8<sup>th</sup> Probiotics, Prebiotics and New Foods for Microbiota and Human Health and 3<sup>rd</sup> International Advanced Course on the Intestinal Microbiome and Diet in Human and Animal Health. She has published three papers related to gut bacteria and their functional characteristics during the PhD study.

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