Methicillin Resistant *Staphylococcus aureus* (MRSA) ST 398 and gut microbiota: interspecies interactions into the mucus layer of ascendant colon

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**Abstract**

**Statement of the Problem:** Intestinal mucus layer may provide a niche for many nosocomial pathogens, including *S. aureus* which can occasionally cause a staphylococcal enterocolitis. Recent exciting researches support the notion that a healthy intestinal microbiota composition can promote resistance to invading pathogenic bacterial species. The purpose of this study was to evaluate the survival of MRSA in simulated human ascendant colon conditions and its interaction with gut microbiota into the mucus layer. **Methodology & Theoretical Orientation:** The study was performed at ascendant colon environment: body-like temperature (37°C), anaerobiosis (N₂), pH 5.7, constant slow shaking (40 RPM). Mucin agar carriers stand for the intestinal mucus layer and a basic feed medium represented the intestinal lumen contents. A three-days long in vitro study was performed by using microbiota from pooled faeces of healthy individuals that were stabilized simulating ascendant colon conditions and a MRSA strain of animal origin (ST398-t011-SCCmeV; 10¹⁷ UFC/mL). Each day we checked the viability of MRSA both into the mucin agar carriers and in the feed medium by using MRSA-SELECT® plates (BioRad). The results were confirmed by quantitative PCR. **Findings:** MRSA population decreased as a function of time during the incubation with luminal colon microbiota where it was not viable after 24 h. Counts of 4 log cfu/g were still obtained in the mucin agar carriers after 72 h of incubation. On the other hand, counts of *Bifidobacterium* and *Akkermansia* increased in the mucin agar carriers as a function of time. **Conclusion & Significance:** The results support the hypothesis that a competitive microbiota may control MRSA intestinal colonization emphasizing the important role of specific groups which can inhibit the adhesion of/displace MRSA from the intestinal mucus layer.

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**Image:**

**Biography**

Elisa Spinelli is a Veterinarian with a postgraduate qualification in Food safety, Certification and Food Risk Communication. She is a PhD student at University of Foggia (Italy) where she is working on the main topic of antimicrobial resistant bacteria from a food safety perspective, focusing on the detection and prevalence of Methicillin resistant *Staphylococcus aureus* (MRSA) in new ecological niches. She has worked over the last six months as a Visiting PhD student at The Research Institute of Food Science (CIAL-CSIC), Madrid (Spain) on the fate of MRSA along the human gastrointestinal tract and its interaction with gut microbiota.

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**Notes/Comment:**