PEB2.09 **Listeria monocytogenes SOS response: role in stress resistance, mutagenesis and biofilm formation**

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The food-borne pathogen *Listeria monocytogenes* is widely distributed in the environment. As a consequence, raw materials used by the food industry could introduce *L. monocytogenes* to food processing facilities. *L. monocytogenes* has evolved various strategies and networks to survive and adapt to changing conditions e.g. during food processing. Recently, the so-called SOS response was found to be activated in heat-shocked *L. monocytogenes* cells. The SOS response is a conserved inducible pathway that is involved in DNA repair and restart of stalled replication forks. We identified the SOS response regulon of *L. monocytogenes* and showed that it is activated in a range of stress conditions contributing to stress resistance and adaptive mutagenesis.

In the present study, we investigated the role of the SOS response in *L. monocytogenes* biofilm formation. *L. monocytogenes* static biofilms on polystyrene and glass consists of a homogeneous layer, while on stainless steel *L. monocytogenes* biofilms consist of isolated microcolonies. Static biofilm cells display the small rod-shaped morphology, which is very similar to that of planktonic cells. However, *L. monocytogenes* continuous flow biofilms consist of ball-shaped microcolonies, which are surrounded by a dense network of knitted chains composed of elongated cells. We showed that continuous flow biofilm formation and not static biofilm formation is dependent on the SOS response. Using Q-PCR analysis, promoter reporters, and SOS response mutants, we showed that the SOS response is activated during knitted-chain biofilm formation and that deletion of its regulon member *yneA*, which is involved in cell elongation during SOS response activation, results in diminished biofilm formation in continuous flow conditions. Furthermore, we demonstrated that activation of the SOS response during continuous flow biofilm formation induced mutagenesis, with wild-type biofilms showing considerably higher rifampicin resistant fractions than Δ*recA* biofilms or wild-type planktonic cultures.

Our results show that the SOS response of *L. monocytogenes* is important for stress resistance, adaptive mutagenesis, and continuous flow biofilm formation, and may therefore contribute to the survival and persistence of this pathogen in food processing environments.