The Influence of the Toxin/Antitoxin mazEF on Growth and Survival of Listeria monocytogenes under Stress

A major factor in the resilience of *Listeria monocytogenes* is the alternative sigma factor B (σB). Type II Toxin/Antitoxin (TA) systems are also known to have a role in the bacterial stress response upon activation via the ClpP or Lon proteases. Directly upstream of the σB operon in *L. monocytogenes* is the TA system mazEF, which can cleave mRNA at UACMU sites. In this study, we showed that the mazEF TA locus does not affect the level of persister formation during treatment with antibiotics in lethal doses, but exerts different effects according to the sub-inhibitory stress added. Growth of a ΔmazEF mutant was enhanced relative to the wildtype in the presence of sub-inhibitory norfloxacin and at 42 °C, but was decreased when challenged with ampicillin and gentamicin. In contrast to studies in Staphylococcus aureus, we found that the mazEF locus did not affect transcription of genes within the σB operon, but MazEF effected the expression of the σB-dependent genes *opuCA* and *lmo0880*, with a 0.22 and 0.05 fold change, respectively, compared to the wildtype under sub-inhibitory norfloxacin conditions. How exactly this system operates remains an open question, however, our data indicates it is not analogous to the system of *S. aureus*, suggesting a novel mode of action for MazEF in *L. monocytogenes*.

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