

SERRATIA MARCESCENS DUF1471-CONTAINING PROTEIN SRFN IS NEEDED FOR OXIDATIVE STRESS SURVIVAL AND BIOFILM FORMATION

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Background

Bacteria can quickly adapt to constantly changing environment at least in part through secretion of secondary metabolites, peptides and proteins. One of such component of bacterial secretome in the order of Enterobacterales is a large family of small proteins (<100 AA) containing DUF1471 domain. While the role of DUF1471-containing proteins in enterobacteria is not well characterized, it was suggested that they are likely to be involved in the process of adaptation to stressful environmental conditions. Our initial analysis of low molecular weight compounds secreted by the gram-negative bacterium *Serratia marcescens* SM6 in response to oxidative stress has identified a DUF1471-containing protein encoded by the gene EG355_19345 (srfN).

Objectives

The goal of this study was to generate *S. marcescens* mutant lacking srfN gene, and to characterize the role of SrfN in resistance of bacteria to oxidative stress and in the ability to maintain biofilm formation.

Methods and Results

The *S. marcescens* deletion mutant Δ srfN was obtained using lambda red-mediated homologous recombination. Deletion of srfN did not affect *S. marcescens* extracellular nuclease, proteolytic, or hemolytic activity in the plate assay. In contrast, srfN mutant was more sensitive to 10 mM hydrogen peroxide compared to the wild type, and sensitivity of this mutant to H₂O₂ was restored in co-culture with wild type *S. marcescens*. In addition, the ability of Δ srfN to form biofilms was reduced at 72 hours compared to wild type strain. In conclusion, *S. marcescens* DUF1471-containing protein SrfN is involved in adaptation to oxidative stress and in biofilm formation