

## Virulence factors contributing to invasive activities of *Serratia grimesii* and *Serratia proteamaculans*

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### Abstract

© 2015, Springer-Verlag Berlin Heidelberg. Previously, we have shown that facultative pathogens *Serratia grimesii* and *Serratia proteamaculans* are capable to invade eukaryotic cells provided that they synthesize intracellular metalloprotease grimelysin or protealysin, respectively (Bozhokina et al. in *Cell Biol Int* 35(2):111–118, 2011). Noninvasive *Escherichia coli* transformed with grimelysin or protealysin gene became invasive, indicating that the protease is a virulence factor. Here we elucidated involvement of other virulence factors in the invasion of *S. grimesii* and *S. proteamaculans*. Under similar experimental conditions, the amount of *S. proteamaculans* internalized within human carcinoma HeLa cells was fivefold higher than that of *S. grimesii*. In accord with this, in *S. proteamaculans*, high activities of pore-forming hemolysin ShIA and extracellular metalloprotease serralyisin were detected. In *S. grimesii*, activity of toxin ShIA was not detected, and the serralyisin activity of the bacterial growth medium was very low. We also show that iron depletion strongly enhanced invasive activity of *S. proteamaculans*, increasing activities of hemolysin ShIA and serralyisin, but did not affect *S. grimesii* properties. These results show that the invasive activity of *S. proteamaculans* is maintained, along with protealysin, by hemolysin and serralyisin. On the other hand, grimelysin is so far the only known invasion factor of *S. grimesii*.

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### Keywords

Bacterial invasion, Grimelysin, Hemolysin, Protealysin, Serralyisin, Virulence factors