

論 文 要 旨

Expression of virulence factors under different environmental conditions in *Aggregatibacter actinomycetemcomitans*

様々な環境条件における *Aggregatibacter actinomycetemcomitans* の遺伝子発現の解析

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Abstract

Aggregatibacter actinomycetemcomitans is a facultative anaerobic Gram-negative bacterium associated with periodontal diseases, especially aggressive periodontitis. The virulence factors of this pathogen, including adhesins, exotoxins and endotoxin, have been extensively studied. However, little is known about their gene expression mode in the host. Herein, we investigated whether culture conditions reflecting in vivo environments, including serum and saliva, alter expression levels of virulence genes in strain HK1651, a JP2 clone. Under aerobic conditions, addition of calf serum (CS) into general medium induced high expression of 2 outer membrane proteins (*omp100* and *omp64*). The high expression of *omp100* and *omp64* was also induced by iron-limited medium. RNA-seq analysis showed that the gene expressions of several factors involved in iron acquisition were increased in CS-containing medium. When HK1651 was grown on agar plates, genes encoding many virulence factors, including the outer membrane proteins, cytolethal distending toxin and leukotoxin, was differentially expressed. Then, we investigated their expression in 5 other *A. actinomycetemcomitans* strains grown in general and CS-containing media. The expression pattern of virulence factors varied among strains. Compared to the other 5 strains, HK1651 showed high expression of *omp29* regardless of the CS addition, while the gene expression of leukotoxin in HK1651 was higher only in medium without CS. HK1651 showed reduced biofilm in both CS- and saliva-containing media. Coaggregation with *Fusobacterium nucleatum* was remarkably enhanced using HK1651 grown in CS-containing medium. Our results indicate that the expression of virulence factors is altered by adaptation to different conditions during infection.