Microbiological Research **163** (2008) 39—50

Available online at www.sciencedirect.com
ScienceDirect

Microbiological Research
www.elsevier.de/micres

The expression of the serine proteinase gene of *Bacillus intermedius* in *Bacillus subtilis*

Margarita Sharipova[a,*], Nelly Balaban[a], Airat Kayumov[a], Yuliya Kirillova[a], Ayslu Mardanova[a], Leila Gabdrakhmanova[a], Inna Leshchinskaya[a], Galina Rudenskaya[b], Tatiana Akimkina[c], Dina Safina[c], Ilya Demidyuk[c], Sergey Kostrov[c]

[a]*Department of Microbiology, Kazan State University, Kazan, Russia*
[b]*Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia*
[c]*Laboratory of Protein Engineering, Institute of Molecular Genetics of Russian Academy of Sciences, Moscow, Russia*

Accepted 8 March 2006

KEYWORDS
Bacillus intermedius;
Serine proteinase;
Gene expression;
Catabolite repression;
Regulation

Summary

The gene encoding for *Bacillus intermedius* serine proteinase was cloned and the complete nucleotide sequence was determined. Gene expression was explored in the protease-deficient strain *Bacillus subtilis* AJ73 during different stages of growth. Catabolite repression involved in control of proteinase expression during transition state and onset of sporulation was not efficient at the late stationary phase. Salt stress leads to induction of serine proteinase production during *B. subtilis* AJ73(pCS9) post-exponential growth. Expression of proteinase in *B. subtilis deg*-mutants may be controlled by DegU regulator. *B. subtilis spo0*-mutants failed to accomplish *B. intermedius* proteinase production. These data suggest complex network regulation of *B. intermedius* serine proteinase expression, including the action of *spo0*, *degU*, catabolite repression and demonstrate changes in control of enzyme biosynthesis at different stages of growth.

Introduction

Bacilli possess a large set of regulatory responses to maintain cell viability under the conditions of nutrient limitations. Starvation acts as an environmental signal for the cells to stop exponential growth and develop rapidly numerous post-exponential-phase adaptive responses including motility and chemotaxis, synthesis of extracellular degradative enzymes and antibiotics, competence for genetic transformation, DNA repair and

*Corresponding author.
E-mail address: Margarita.Sharipova@ksu.ru (M. Sharipova).

0944-5013/$ - see front matter © 2006 Elsevier GmbH. All rights reserved.
doi:10.1016/j.micres.2006.03.003