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Expression of the genes for guanyl-specific ribonucleases from *Bacillus intermedius* and *Bacillus pumilus* is regulated by the two component signal transduction system PhoP-PhoR in *B. subtilis*

Lilia V. Znamenskaya^{a,*}, Olga A. Vershinina^a, Valentina I. Vershinina^a,
Inna B. Leshchinskaya^a, Robert W. Hartley^b

^a Laboratory of the Biosynthesis and Bioengineering of Enzymes, Department of Microbiology, Kazan State University, Kazan 420008, Russia

^b Laboratory of Cellular and Developmental Biology, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, Bethesda, MD 20892, USA

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Abstract

Promoters of the genes for guanyl-specific ribonucleases, secreted by *B. intermedius* (binase) and *B. pumilus* (Rnase Bp) in phosphate deficient conditions, contain regions similar to appropriate consensus sequences in promoters of the PHO regulated genes of *B. subtilis*. A number of genes expressed in response to phosphate starvation in *B. subtilis* are regulated by the two component signal transduction system PhoP-PhoR. Expression of recombinant genes for binase and RNase Bp in *B. subtilis* strains with mutations in the regulatory protein genes of the PHO regulon was studied. Their expression is strongly regulated by the regulatory proteins of the *B. subtilis* PHO regulon. © 1999 Published by Elsevier Science B.V. All rights reserved.

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1. Introduction

Bacteria of the genus *Bacillus* respond to the depletion of nutrients by a set of different reactions, including the production of degradative enzymes [1,2]. Secreted guanyl-specific ribonucleases are synthesized by many *Bacillus* species: *Bacillus amyloliquefaciens*, *Bacillus intermedius*, *Bacillus pumilus*, *Bacillus thuringiensis*, *Bacillus coagulans*, *Bacillus circulans*. These enzymes catalyze the cleavage of

phosphodiester bonds in RNA, oligo and polynucleotides into mono and small oligonucleotides by a two stage mechanism with the formation of 2'-3'-cyclic phosphates with later hydrolysis to the nucleoside-3'-phosphates [3]. The genes for guanyl-specific ribonucleases have homologous parts encoding mature proteins.

Guanyl-specific ribonucleases from *B. intermedius* (binase) and *B. pumilus* (RNase Bp) are synthesized during the transition from exponential growth to the stationary phase as a result of inorganic phosphate (P_i) depletion [4]. A number of *B. subtilis* genes, induced in response to phosphate deprivation, depend

* Corresponding author. Tel.: +7 (8432) 31-54-42;
Fax: +7 (8432) 380994; E-mail: lilia.znamenskaya@ksu.ru