

Accepted Manuscript

Three cellulosomal xylanase genes in *C. thermocellum* are regulated by both vegetative SigA (σ^A) and alternative SigI6 (σ^{I6}) factors

Andy Sand, Evert K. Holwerda, Natalie M. Ruppertsberger, Marybeth Maloney, Daniel G. Olson, Yakir Nataf, Ilya Borovok, Abraham L. Sonenshein, Edward A. Bayer, Raphael Lamed, Lee R. Lynd, Yuval Shoham

PII: S0014-5793(15)00726-7

DOI: <http://dx.doi.org/10.1016/j.febslet.2015.08.026>

Reference: FEBS 37336

To appear in: *FEBS Letters*

Received Date: 12 July 2015

Revised Date: 10 August 2015

Accepted Date: 14 August 2015

Please cite this article as: Sand, A., Holwerda, E.K., Ruppertsberger, N.M., Maloney, M., Olson, D.G., Nataf, Y., Borovok, I., Sonenshein, A.L., Bayer, E.A., Lamed, R., Lynd, L.R., Shoham, Y., Three cellulosomal xylanase genes in *C. thermocellum* are regulated by both vegetative SigA (σ^A) and alternative SigI6 (σ^{I6}) factors, *FEBS Letters* (2015), doi: <http://dx.doi.org/10.1016/j.febslet.2015.08.026>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Three cellulosomal xylanase genes in *C. thermocellum* are regulated by both vegetative SigA (σ^A) and alternative SigI6 (σ^{I6}) factors

Andy Sand^{*a}, Evert K. Holwerda^{*b}, Natalie M. Ruppertsberger^b, Marybeth Maloney^b, Daniel G. Olson^b, Yakir Nataf^a, Ilya Borovok^c, Abraham L. Sonenshein^d, Edward A. Bayer^e, Raphael Lamed^c, Lee R. Lynd^b, and Yuval Shoham^a

^a Department of Biotechnology and Food Engineering, Technion–Israel Institute of Technology, Haifa 32000, Israel

^b Thayer School of Engineering at Dartmouth College, Hanover, New Hampshire 03755, United States

^c Department of Molecular Microbiology and Biotechnology, Tel-Aviv University, Ramat Aviv 69978, Israel

^d Department of Molecular Biology and Microbiology, Tufts University School of Medicine, Boston, MA 02111

^e Department of Biological Chemistry, The Weizmann Institute of Science, Rehovot 76100, Israel

*Contributed equally to this work

Abstract

Clostridium thermocellum efficiently degrades crystalline cellulose by a high molecular weight protein complex, the cellulosome. The bacterium regulates its cellulosomal genes using a unique extracellular biomass-sensing mechanism that involves alternative sigma factors and extracellular carbohydrate-binding modules attached to intracellular anti-sigma domains. In this study, we identified three cellulosomal xylanase genes that are regulated by the σ^{I6} /RsgI6 system by utilizing *sigI6* and *rsgI6* knockout mutants together with primer extension analysis. Our results indicate that cellulosomal genes are expressed from both alternative σ^{I6} and weak σ^A vegetative promoters.

Abbreviations

Download English Version:

<https://daneshyari.com/en/article/10869877>

Download Persian Version:

<https://daneshyari.com/article/10869877>

[Daneshyari.com](https://daneshyari.com)