

Publication

Antigen 84, an effector of pleiomorphism in *Mycobacterium smegmatis*

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 156420

Author(s) Nguyen, L.; Scherr, N.; Gatfield, J.; Walburger, A.; Pieters, J.; Thompson, C. J.

Author(s) at UniBasel [Pieters, Jean](#) ;

Year 2007

Title Antigen 84, an effector of pleiomorphism in *Mycobacterium smegmatis*

Journal Journal of bacteriology

Volume 189

Number 21

Pages / Article-Number 7896-910

Keywords Antigens; Bacterial/*genetics/*ultrastructure; Chromatography; Gel; Computational Biology; DNA Primers; Gene Expression Regulation; Bacterial; Genotype; *Mycobacterium smegmatis*/classification/*genetics/*ultrastructure; Phylogeny; Plasmids

While in most rod-shaped bacteria, morphology is based on MreB-like proteins that form an actin-like cytoskeletal scaffold for cell wall biosynthesis, the factors that determine the more flexible rod-like shape in actinobacteria such as *Mycobacterium* species are unknown. Here we show that a *Mycobacterium smegmatis* protein homologous to eubacterial DivIVA-like proteins, including *M. tuberculosis* antigen 84 (Ag84), localized symmetrically to centers of peptidoglycan biosynthesis at the poles and septa. Controlled gene disruption experiments indicated that the gene encoding Ag84, *wag31*, was essential; when overexpressed, cells became longer and wider, with Ag84 asymmetrically distributed at one pole. Many became grossly enlarged, bowling-pin-shaped cells having up to 80-fold-increased volume. In these cells, Ag84 accumulated predominantly at a bulbous pole that was apparently generated by uncontrolled cell wall expansion. In some cells, Ag84 was associated with exceptional sites of cell wall expansion (buds) that evolved into branches. *M. bovis* BCG Ag84 was able to form oligomers in vitro, perhaps reflecting its superstructure in vivo. These data suggested a role for Ag84 in cell division and modulating cell shape in pleiomorphic actinobacteria.

Publisher American Society for Microbiology

ISSN/ISBN 1098-5530

edoc-URL <http://edoc.unibas.ch/dok/A5259393>

Full Text on edoc Available;

Digital Object Identifier DOI 10.1128/JB.00726-07

PubMed ID <http://www.ncbi.nlm.nih.gov/pubmed/17766411>

ISI-Number WOS:000250417200039

Document type (ISI) Journal Article