

## Accepted Manuscript

Mutations on FtsZ lateral helix H3 that disrupt cell viability hamper reorganization of polymers on lipid surfaces

Ileana F. Márquez, Pablo Mateos-Gil, Jae Yen Shin, Rosalba Lagosb, Octavio Monasterio, Marisela Vélez

PII: S0005-2736(17)30190-6  
DOI: doi:[10.1016/j.bbamem.2017.06.009](https://doi.org/10.1016/j.bbamem.2017.06.009)  
Reference: BBAMEM 82522

To appear in: *BBA - Biomembranes*

Received date: 10 February 2017  
Revised date: 24 May 2017  
Accepted date: 16 June 2017



Please cite this article as: Ileana F. Márquez, Pablo Mateos-Gil, Jae Yen Shin, Rosalba Lagosb, Octavio Monasterio, Marisela Vélez, Mutations on FtsZ lateral helix H3 that disrupt cell viability hamper reorganization of polymers on lipid surfaces, *BBA - Biomembranes* (2017), doi:[10.1016/j.bbamem.2017.06.009](https://doi.org/10.1016/j.bbamem.2017.06.009)

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.

## Mutations on FtsZ lateral helix H3 that disrupt cell viability hamper reorganization of polymers on lipid surfaces

Ileana F. Márquez<sup>1</sup>, Pablo Mateos-Gil<sup>1,2</sup>, Jae Yen Shin<sup>3</sup>, Rosalba Lagos<sup>3</sup>, Octavio Monasterio<sup>3</sup> and Marisela Vélez<sup>1</sup> \*

<sup>1</sup>*Instituto de Catálisis y Petroleoquímica; c/Marie Curie 2*

*Cantoblanco Madrid 28049*

<sup>2</sup>Present Address: Department of Biotechnology and Biophysics, Julius Maximilian University of Würzburg, Würzburg, Germany

<sup>3</sup> *Departamento de Biología, Facultad de Ciencias, Casilla 653, Santiago 1, Chile*

\*corresponding author

### Abstract

FtsZ filaments localize at the middle of the bacterial cell and participate in the formation of a contractile ring responsible for cell division. Previous studies demonstrated that the highly conserved negative charge of glutamate 83 and the positive charge of arginine 85 located in the lateral helix H3 bend of *Escherichia coli* FtsZ are required for *in vivo* cell division. In order to understand how these lateral mutations impair the formation of a contractile ring, we extend previous *in vitro* characterization of these mutants in solution to study their behavior on lipid modified surfaces. We study their interaction with ZipA and look at their reorganization on the surface. We found that the dynamic bundling capacity of the mutant proteins is deficient, and this impairment increases the more the composition and spatial arrangement of the reconstituted system resembles the situation inside the cell: mutant proteins completely fail to reorganize to form higher order aggregates when bound to an *E.coli* lipid surface through oriented ZipA. We conclude that these surface lateral point mutations affect the dynamic reorganization of FtsZ filaments into bundles on the cell membrane, suggesting that this event is relevant for generating force and completing bacterial division.

Download English Version:

<https://daneshyari.com/en/article/5507481>

Download Persian Version:

<https://daneshyari.com/article/5507481>

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