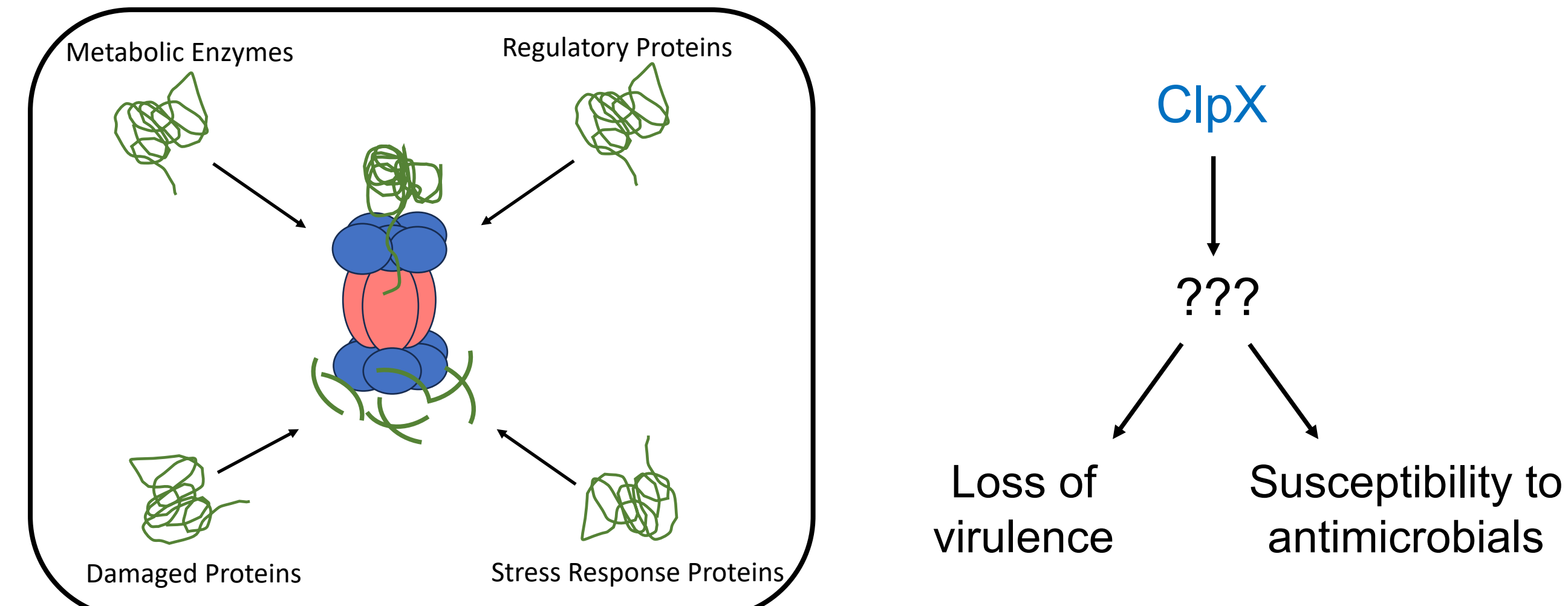


Role of MsrB in the Cell Envelope Antibiotic Tolerance of *Bacillus anthracis* Sterne

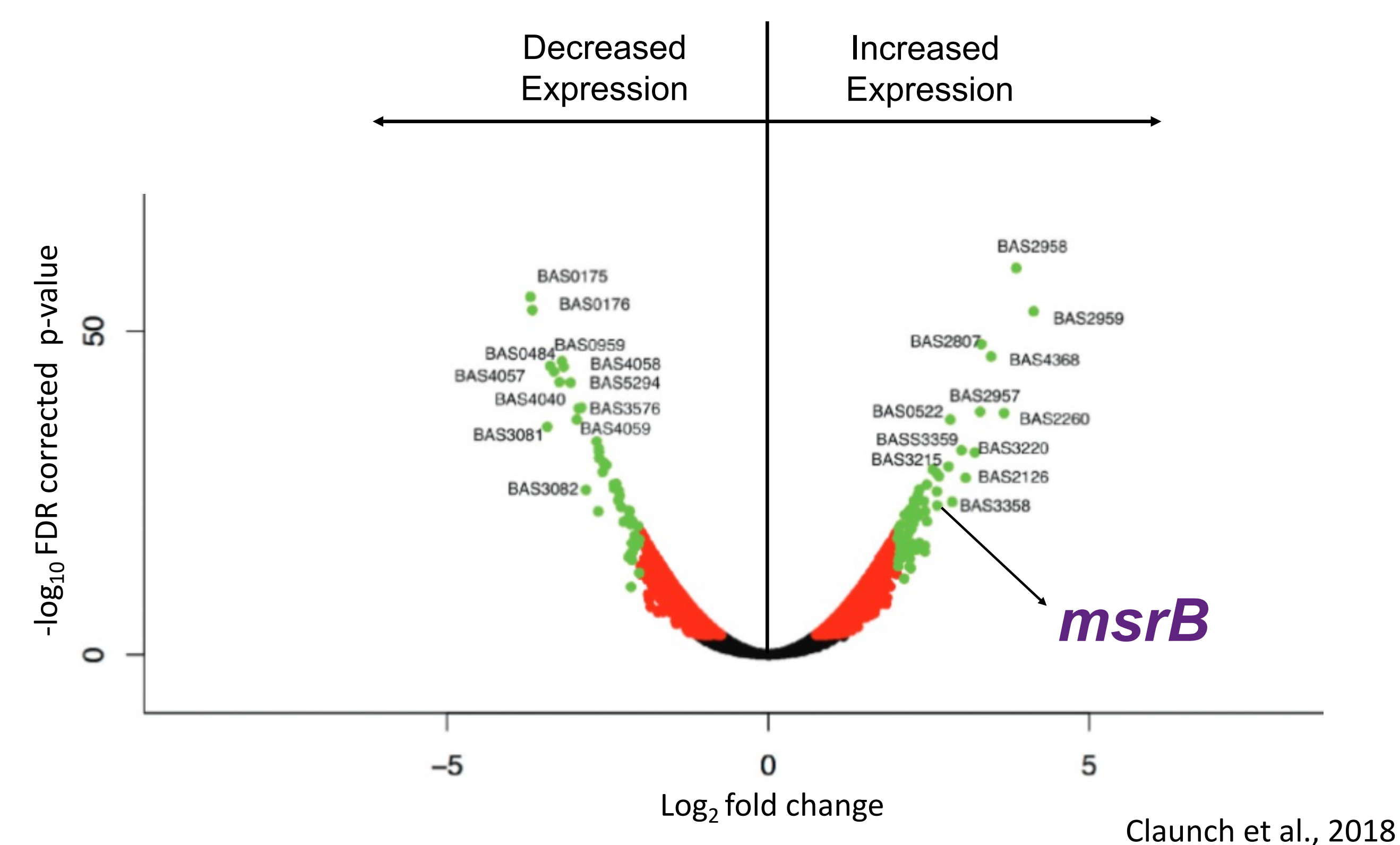
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Background

ClpX is essential for virulence in *Bacillus anthracis* and critical for resistance to antimicrobials. However, the exact mechanism behind this phenomenon is not yet fully understood. ClpX is a regulatory subunit of a major global protease, ClpXP.



Differential Gene Expression in $\Delta ClpX$



Methionine Sulfoxide Reductase (MsrB)

Methionine Sulfoxide Reductase:

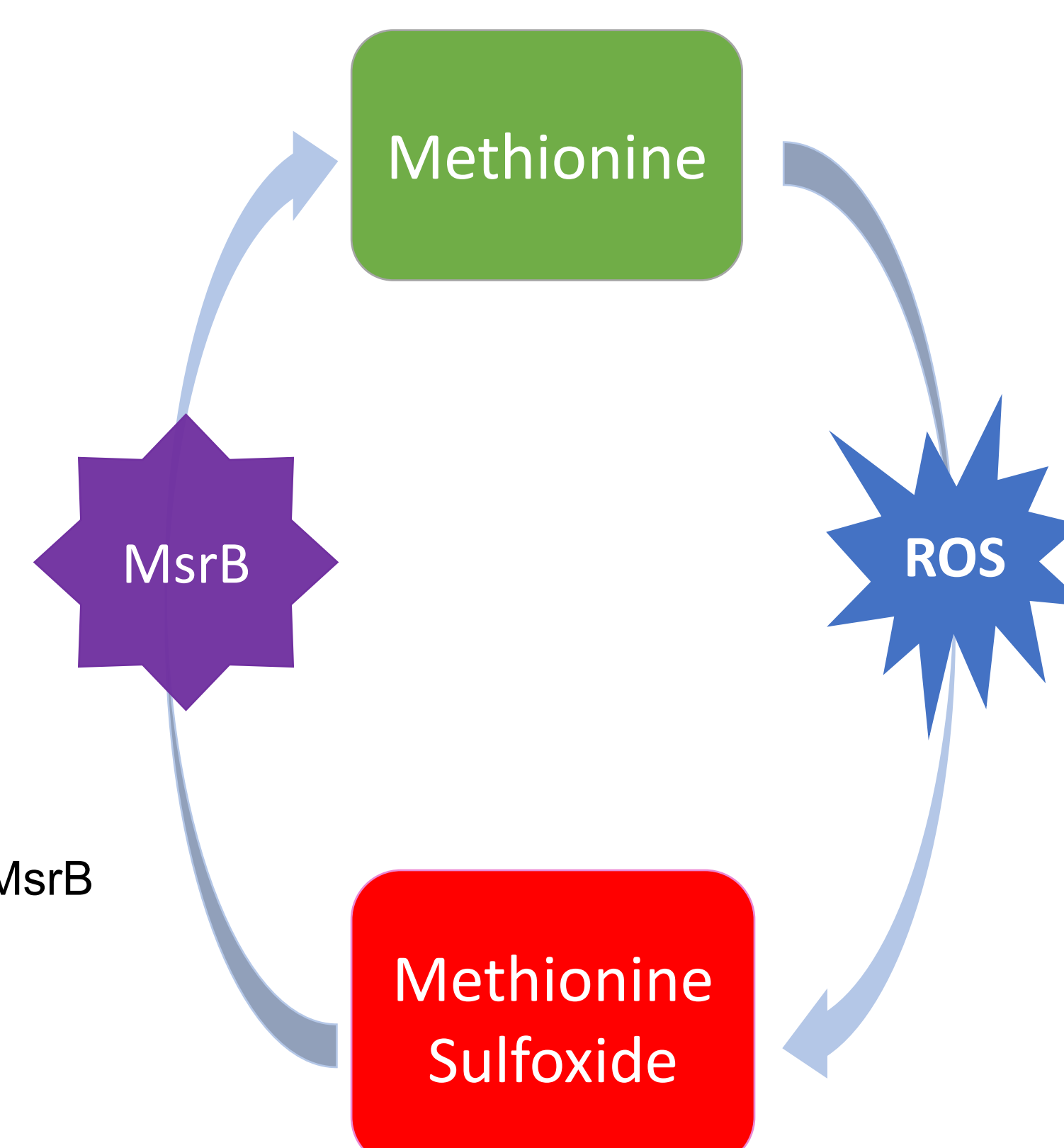
- Antioxidant enzyme
- Linked to the tolerance of ROS

In *S. aureus*:

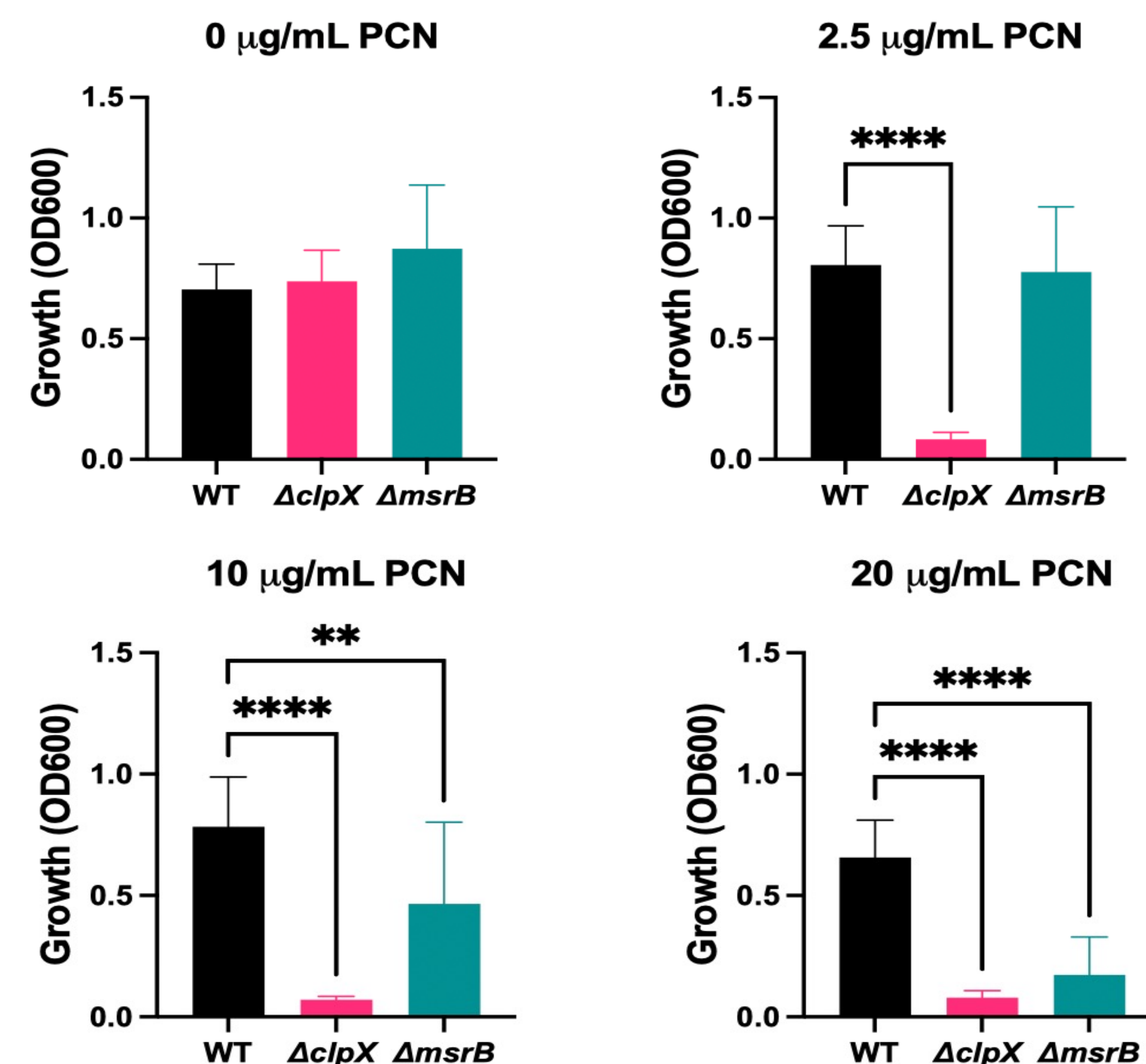
- ROS Tolerance
- Oxacillin-induced expression

In *B. anthracis*:

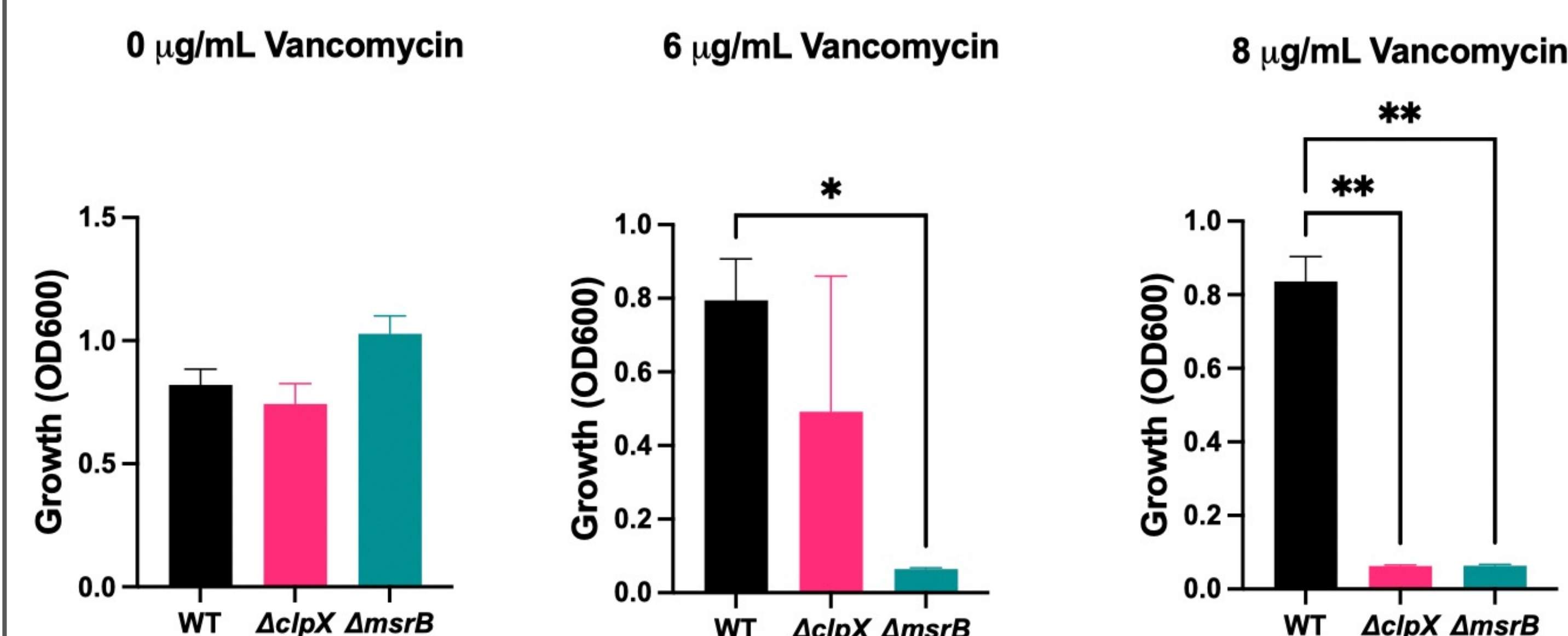
- No previous connection between ClpX and MsrB
- The role of MsrB has not been investigated



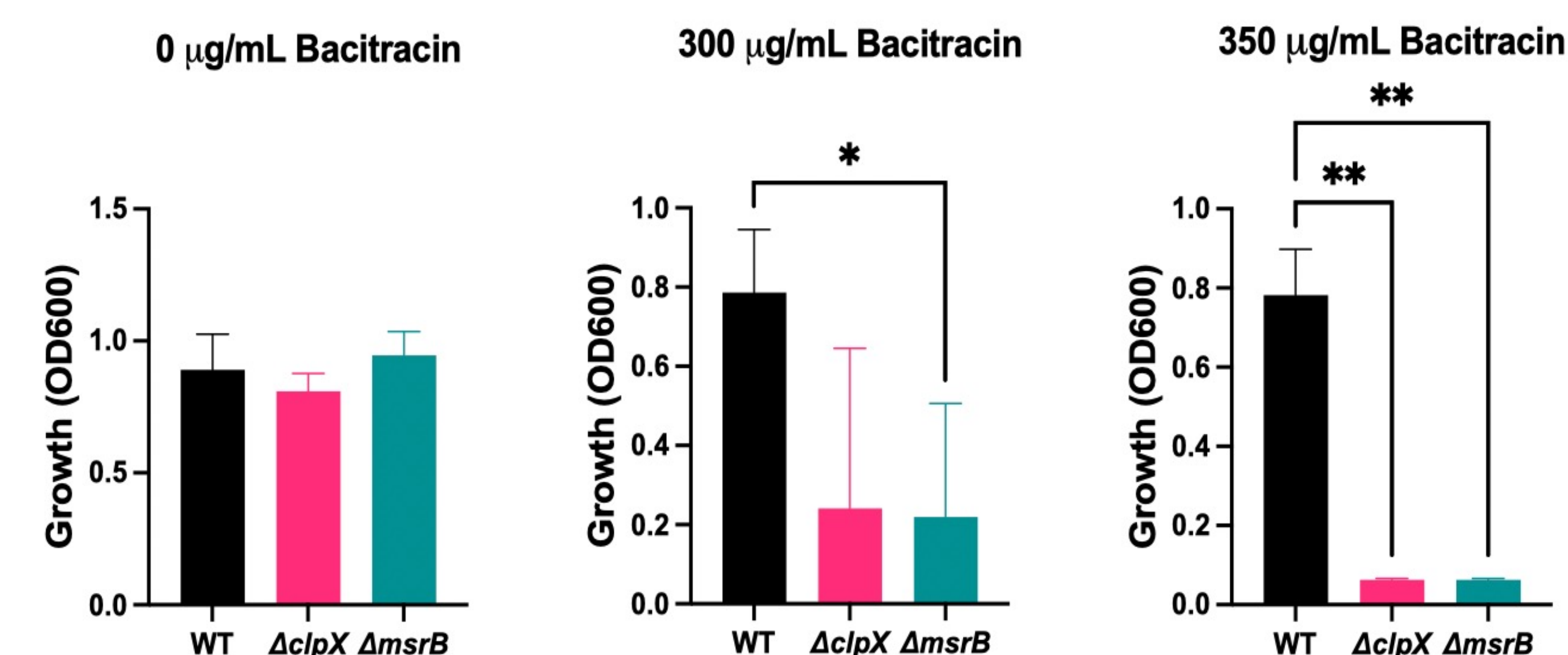
Susceptibility to Cell Wall Active Antimicrobials



Data is represented as mean \pm SD. Assays were repeated at least 3 times. Statistical significance

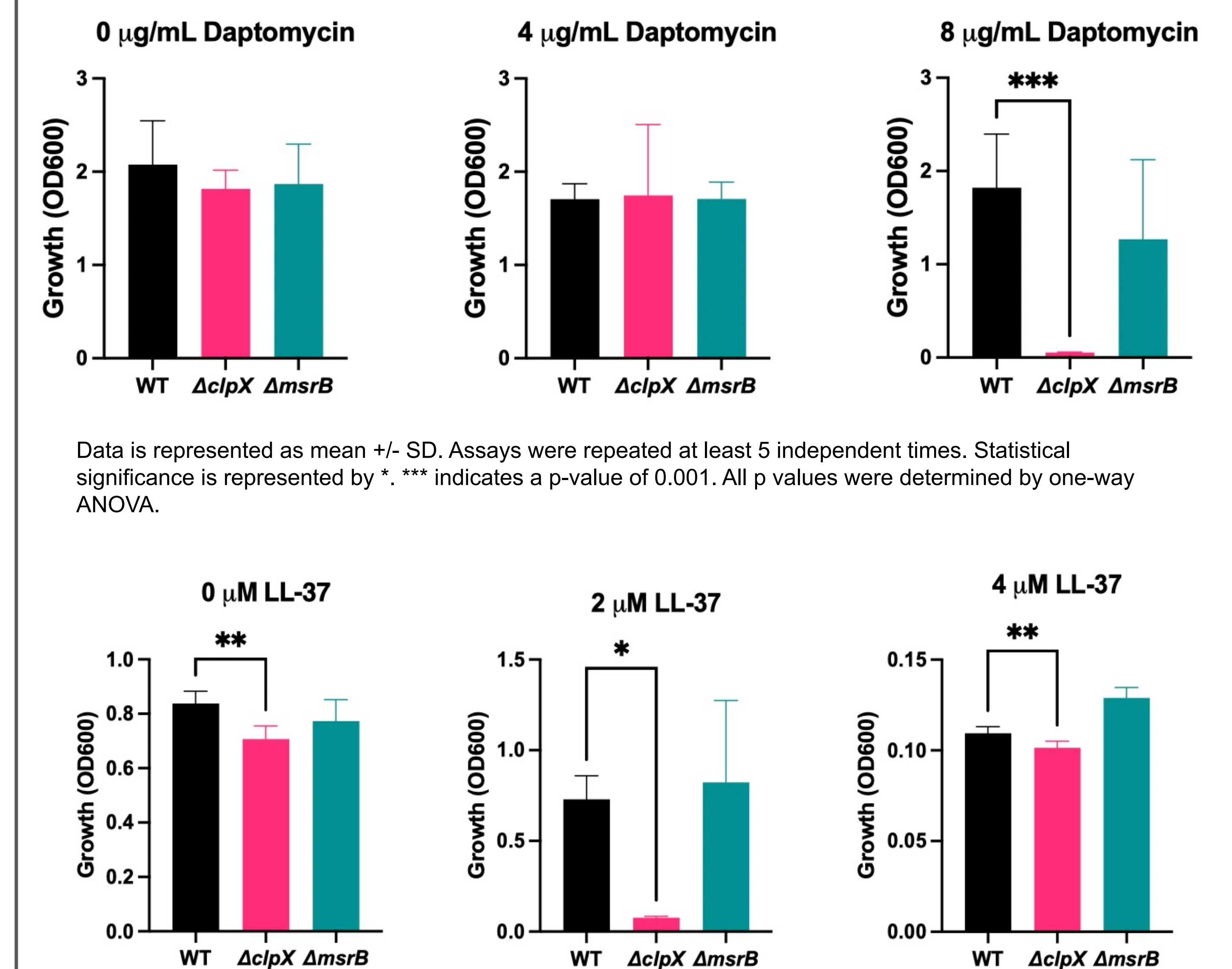


Data is represented as mean \pm SD, and assays were repeated three independent times. Statistical significance is represented by *. * indicates a p-value of 0.05, and ** indicates a p-value of 0.01. All p values were determined by one-way ANOVA.



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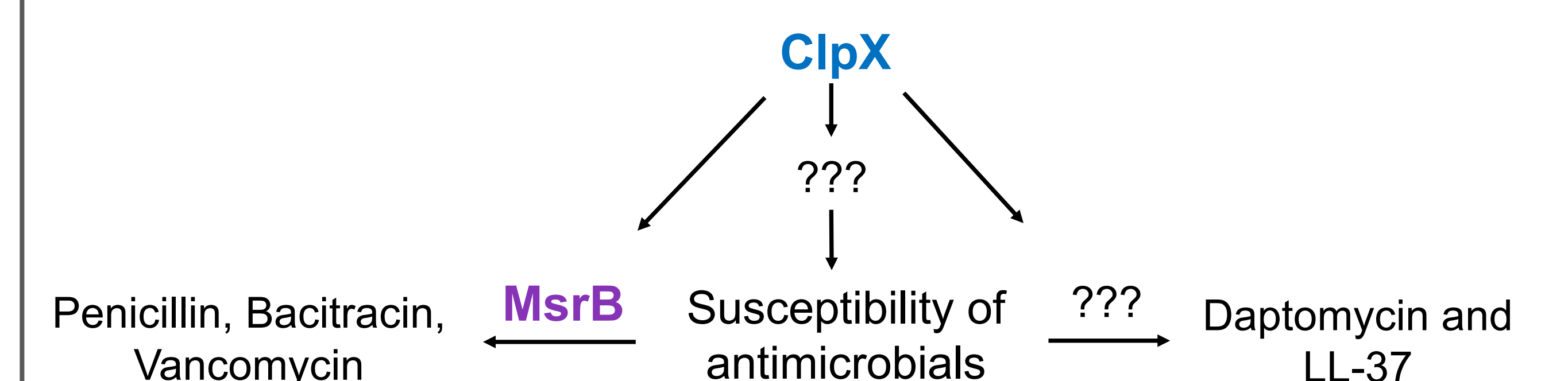
Susceptibility of Cell Membrane Antimicrobials



Data is represented as mean \pm SD. Assays were repeated at least 5 independent times. Statistical significance is represented by *. *** indicates a p-value of 0.001. All p values were determined by one-way ANOVA.

Data is represented as mean \pm SD. 0 μ M and 2 μ M assays were repeated at least 3 independent times. 4 μ M was repeated twice independently. Statistical significance is represented by *. * Indicates a p-value 0.05. ** indicates a p-value 0.01. All p values were determined by one-way ANOVA.

Summary



Future Directions

- Perform MIC with reactive oxygen species
- Complement *msrB* to confirm observed phenotypes
- Examine the regulation of *msrB* expression in WT and $\Delta clpX$ with and without penicillin

Acknowledgments

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