



Séminaire externe



Rho-controlled pervasive transcription in the regulation of *Bacillus subtilis* cell development.



Pervasive transcription is widely spread in all kingdoms of life. However, its output on physiology of bacterial cell remains unknown. Transcription termination factor Rho, responsible for the main factor-dependent termination pathway in bacteria, plays a key role in the suppression of pervasive, mostly antisense transcription. We addressed the biological significance of pervasive transcription controlled by Rho in the model Gram-positive bacterium *Bacillus subtilis*. Significant perturbations of the global gene expression detected in *rho* mutant allowed us to identify elements of Rho-controlled transcriptome and demonstrate how a considerable part of this transcriptome is connected to regulation of mutually exclusive lifestyles of *B. subtilis* cells: motility, biofilm formation and sporulation. In the absence of Rho, several up-regulated sense and antisense transcripts alter, directly or indirectly, expression of the key structural and regulatory factors of the cellular differentiation, thereby inhibiting motility and biofilm formation and stimulating sporulation. A reinforced suppression of pervasive transcription due to Rho over-expression has opposite physiological effects. We dissect how Rho is involved in the cell fate regulatory network centered on master regulator Spo0A by modulating activity of Spo0A phosphorelay. Our findings demonstrate that Rho-controlled transcripts are functional and constitute a new element of the *B. subtilis* cell differentiation network. This ranks termination factor Rho among the global regulators of *B. subtilis* cells and advances our understanding of the role of pervasive transcription in bacteria.

Grylak-Mielnicka, A., Bidnenko, V., Bardowski, J., & Bidnenko, E. (2016). Transcription termination factor Rho: a hub linking diverse physiological processes in bacteria. *Microbiology*, 162(3), 433-447.

Bidnenko, V., Nicolas, P., Grylak-Mielnicka, A., Delumeau, O., Auger, S., Aucouturier, A., ... & Bidnenko, E. (2017). Termination factor Rho: From the control of pervasive transcription to cell fate determination in *Bacillus subtilis*. *PLoS genetics*, 13(7), e1006909.

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Invitée par

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Salle de conférence du CBM