

Transcriptomic Insights into the Genetic Regulations of Leptospira interrogans within a Mature Biofilm.

Grégoire Davignon, Natalia Pietrosemoli, Nadia Benaroudj, Marie-Estelle Soupé-Gilbert, Julie Cagliero, Marc Monot, Elodie Turc, Mathieu Picardeau, Linda Guentas, Cyrille Goarant, et al.

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ÉCOLE DOCTORALE DU PACIFIQUE

Transcriptomic insights into the genetic regulations of Leptospira interrogans within a mature biofilm

Gordon Research Conferences

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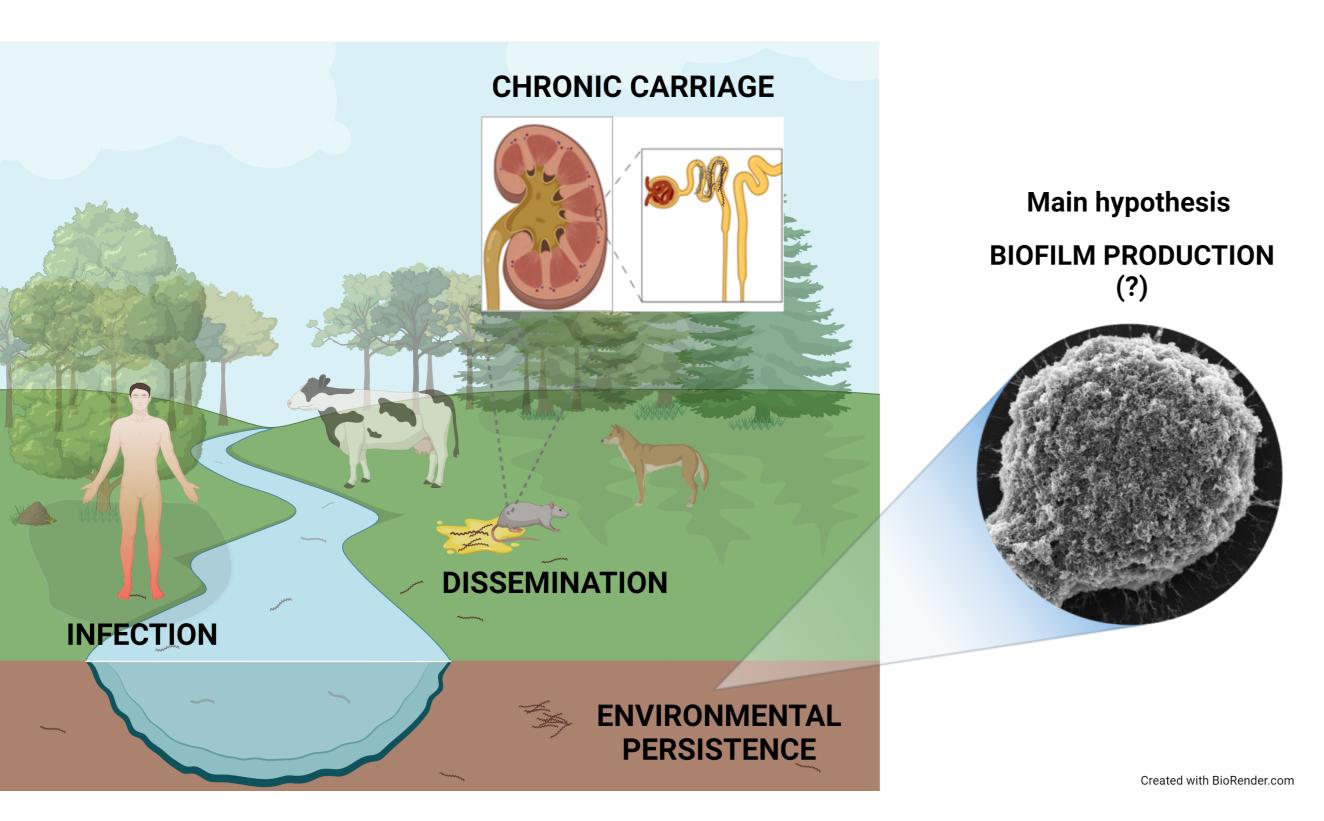
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INTRODUCTION



Could biofilm be the missing link in understanding the environmental persistence and chronic carriage of leptospires?

Leptospira interrogans, the causative agent of leptospirosis, goes through a complex life cycle in which biofilm formation could be one critical survival strategy under adverse environmental conditions. The genetic mechanisms underlying the motile-sessile shifts in L. interrogans remain largely unexplored. To unravel the transcriptomic regulation in L. interrogans within a mature biofilm, we performed a RNA-seq analysis. We also assessed the metabolic state of biofilm-forming bacteria and their ability to initiate infection.

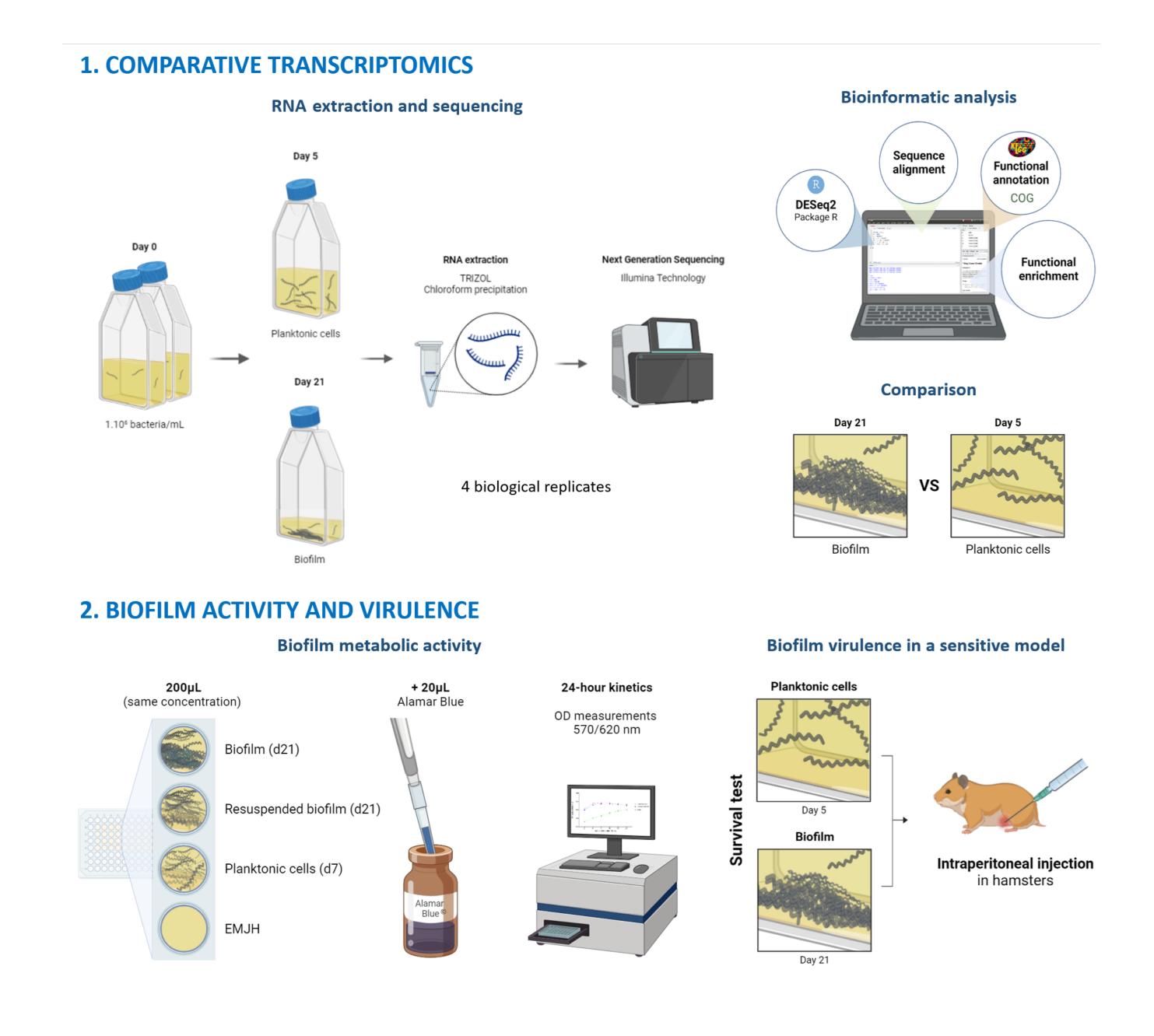
OBJECTIVES

What are the transcriptomic changes between planktonic cells and a mature biofilm of a pathogenic strain of *Leptospira interrogans*?

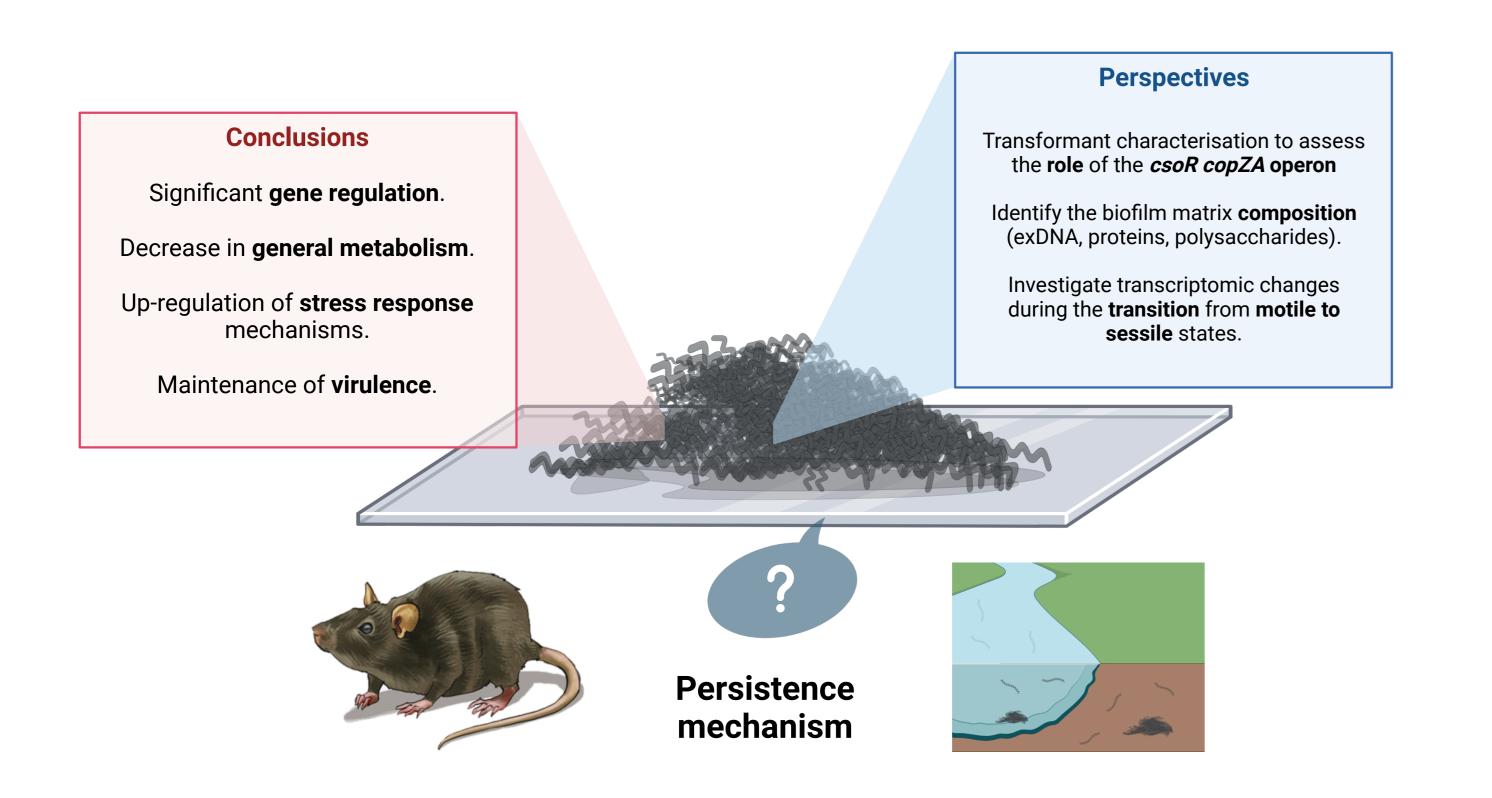
Could we identify genes involved in **biofilm formation** and **environmental** adaptation?

Is Leptospira interrogans still virulent when in a biofilm state?

METHODS

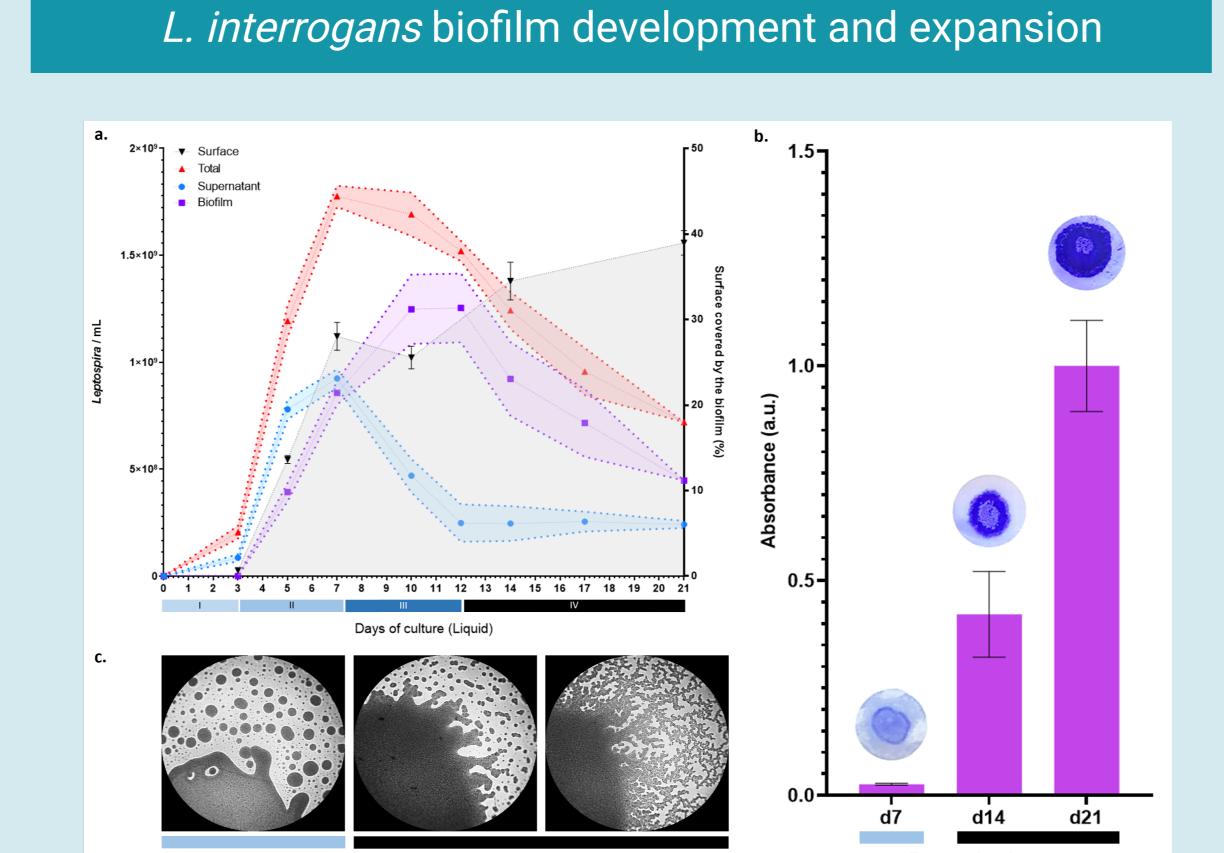


CONCLUSION AND PERSPECTIVES



Day 21 likely shows a combination of **biofilm** and **starvation traits**.

RESULTS



Although the biofilm surface expands for up to 21 days, the number of bacterial cells decreases over time, probably giving way to a larger portion of matrix or dead cells.

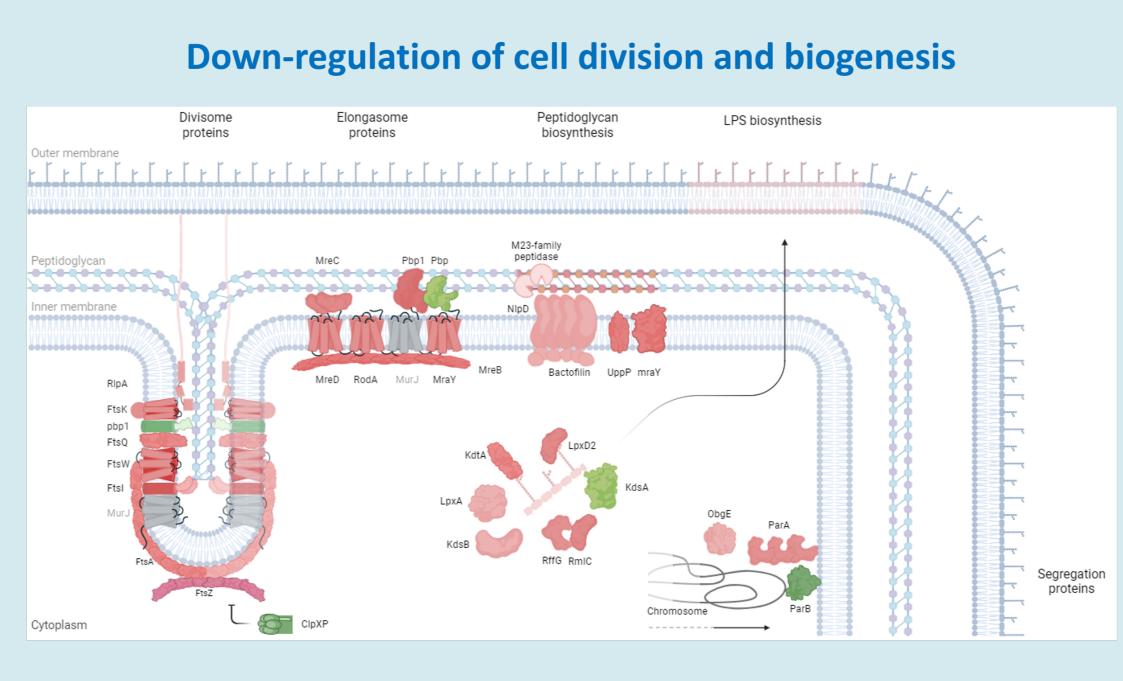
One-third of the genome is regulated within a mature biofilm



1263 modulated genes out of 3651 612 up-regulated genes and 651 down-regulated genes Evenly distributed on the chromosomes and the plasmid

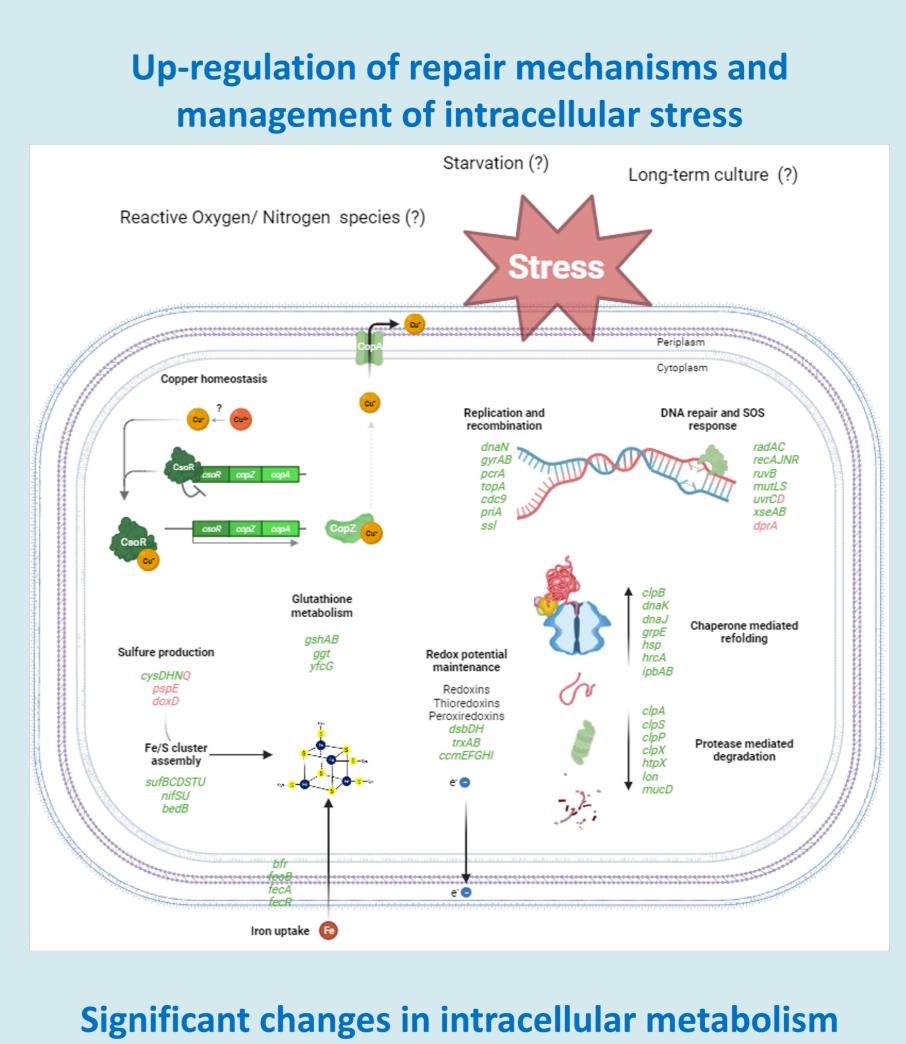
While the general metabolism is down-regulated, the stress response is up-regulated in the biofilm state

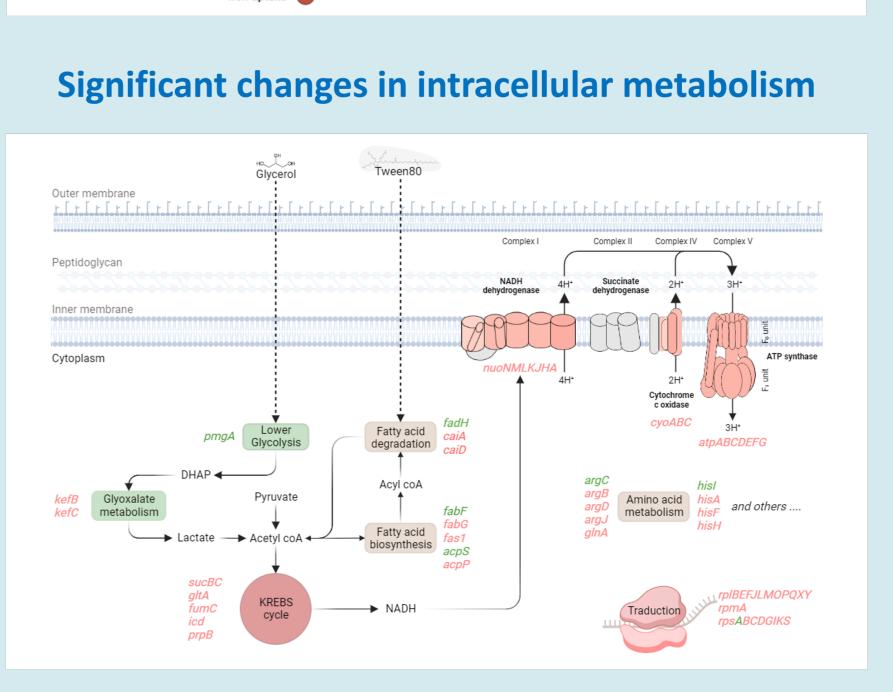
Loss of motility and chemotaxis Outer membrane Hook Signal molecules Inner membrane Methyl-accepting chemotaxis proteins



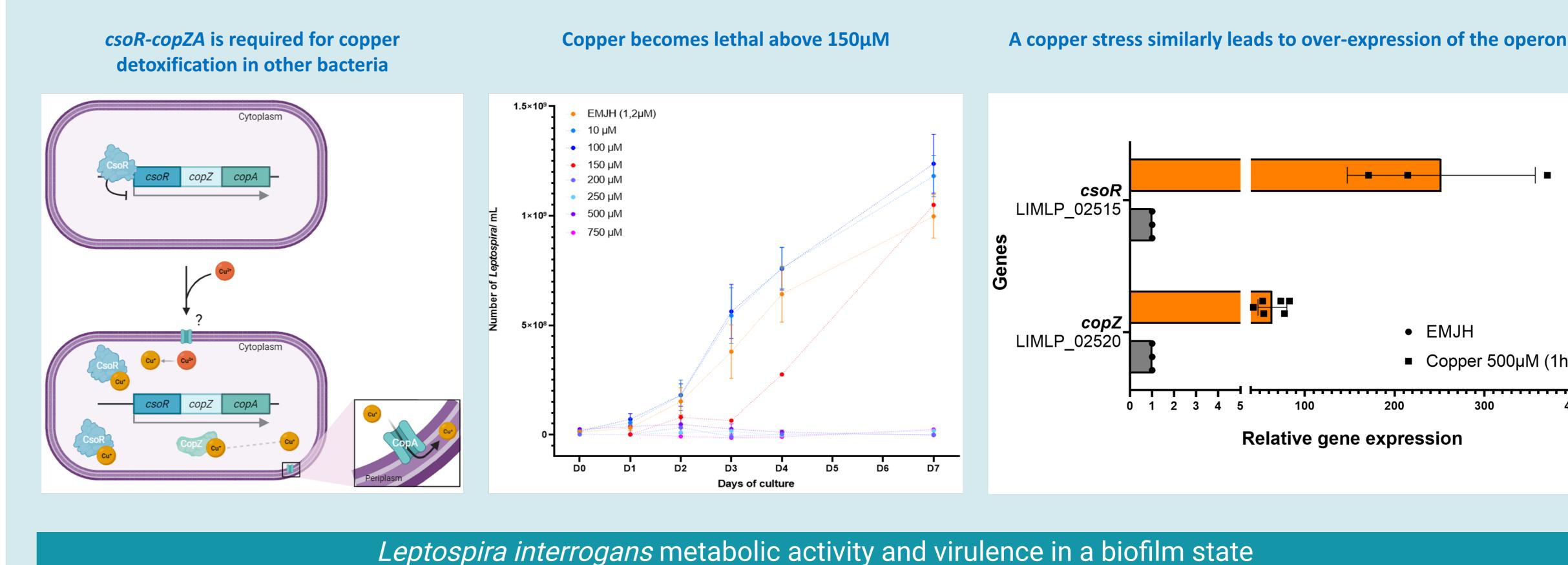
24h

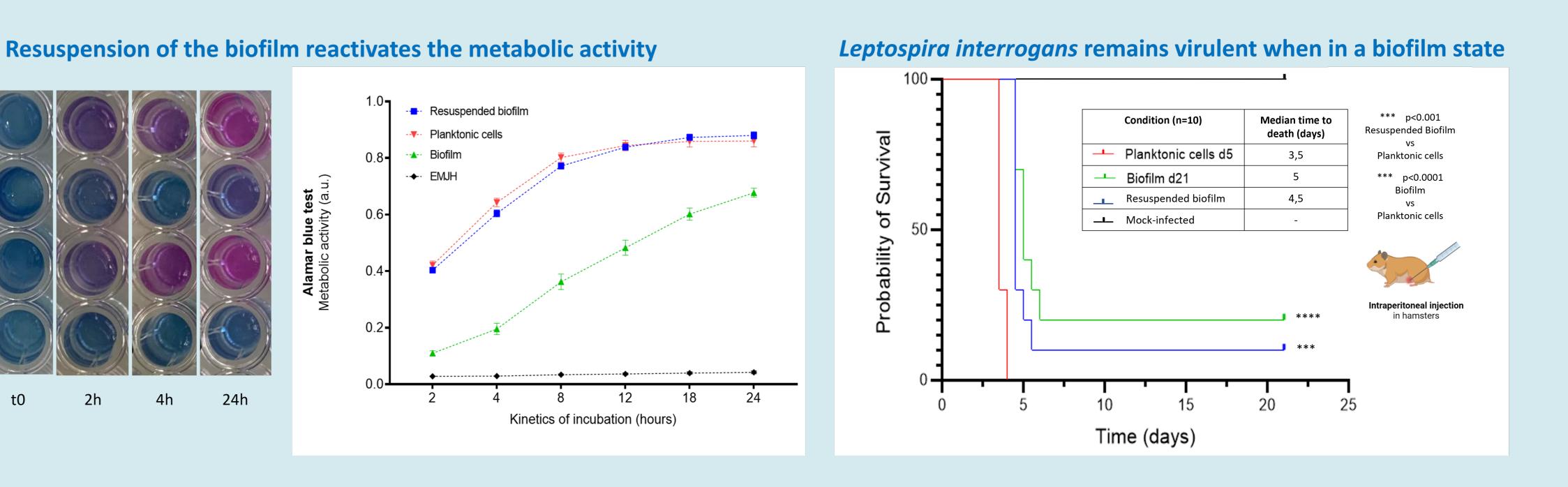
Planktonic











EMJH

■ Copper 500µM (1h)