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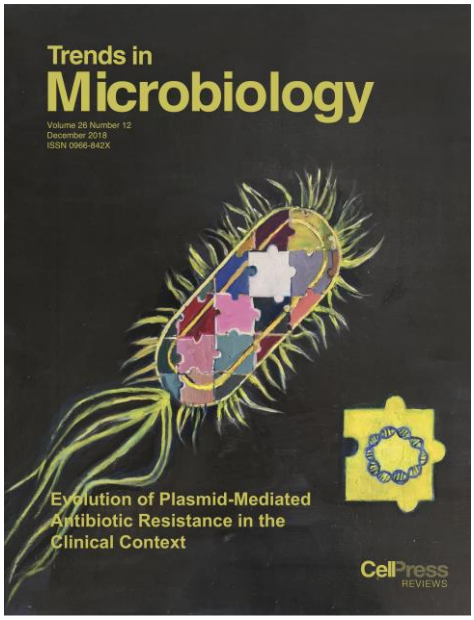

EVOLUTION OF PLASMID-MEDIATED ANTIBIOTIC RESISTANCE IN THE CLINICAL CONTEXT

Antibiotic-resistant infections are an urgent problem in clinical settings because they sharply increase mortality risk in critically ill patients. The horizontal spread of antibiotic resistance genes among bacteria is mainly driven by extra-chromosomal DNA elements known as plasmids. Bacterial plasmids disseminate resistance genes among the most worrisome clinical pathogens. Crucially, some of the associations between resistance plasmids and bacterial clones become especially successful, creating 'superbugs' that spread uncontrollably in hospitals. However, we are still a long way from understanding the molecular and evolutionary mechanisms that determine the success of these associations in the clinical context. In this new paper, Alvaro explores some of the key factors involved in the evolution of plasmid-mediated antibiotic resistance.

Why do you highligth this publication?

Antibiotic resistance in bacteria is one of the biggest threats currently facing humanity, and plasmids play an essential role in its evolution. In this new publication I shed some light on the evolutionary processes that govern the emergence of plasmid-mediated antibiotic resistance. This opinion paper has attracted quite a lot of interest in our field, and it has been highlighted on the cover of the December issue of *Trends in Microbiology* (see picture attached).

Most importantly, this publication sets the stage for an ambitious European project that we are currently developing in the Department of Microbiology (PLASREVOLUTION, ERC-StG). In this multidisciplinary project we will explore the genetic basis underlying the evolution of plasmid-mediated antibiotic resistance in our hospital. This ground-breaking project will open new research avenues and will provide a major step towards meeting one of the central challenges facing our society: controlling the spread of antibiotic resistance.

"We want to understand the evolutionary basis underlying the rise and spread of anitibiotic-resistant bacteria in our hospital"

- Dr. Alvaro San Millan -

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