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## Extracellular membrane vesicles secreted by mycoplasma *Acholeplasma laidlawii* PG8 are enriched in virulence proteins



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### ABSTRACT

Mycoplasmas (class Mollicutes), the smallest prokaryotes capable of self-replication, as well as Archaea, Gram-positive and Gram-negative bacteria constitutively produce extracellular vesicles (EVs). However, little is known regarding the content and functions of mycoplasma vesicles. Here, we present for the first time a proteomics-based characterisation of extracellular membrane vesicles from *Acholeplasma laidlawii* PG8. The ubiquitous mycoplasma is widespread in nature, found in humans, animals and plants, and is the causative agent of phytomycoplasmoses and the predominant contaminant of cell cultures. Taking a proteomics approach using LC-ESI-MS/MS, we identified 97 proteins. Analysis of the identified proteins indicated that *A. laidlawii*-derived EVs are enriched in virulence proteins that may play critical roles in mycoplasma-induced pathogenesis. Our data will help to elucidate the functions of mycoplasma-derived EVs and to develop effective methods to control infections and contaminations of cell cultures by mycoplasmas.

In the present study, we have documented for the first time the proteins in EVs secreted by mycoplasma vesicular proteins identified in this study are likely involved in the adaptation of bacteria to stressors, survival in microbial communities and pathogen–host interactions. These findings suggest that the secretion of EVs is an evolutionally conserved and universal process that occurs in organisms from the simplest wall-less bacteria to complex organisms and indicate the necessity of developing new approaches to control infects.

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## 1. Introduction

*Acholeplasma laidlawii* (class Mollicutes) is a ubiquitous mycoplasma that is widespread in nature, found in tissues from humans, animals and plants. *A. laidlawii* is the causative agent of phytomycoplasmoses and the predominant contaminant

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