Abstract

Vga(A)$_{LC}$ and Msr(A) are clinically significant resistant proteins in staphylococci that confer resistance to translational inhibitors. They belong to ARE ABC-F protein subfamily, which is part of ABC transporters. Unlike typical ABC transporters, ABC-F proteins do not have transmembrane domains that are responsible for the transport of substances through the membrane. Therefore, they do not have characteristic transport function but regulatory or resistance function. Their mechanism of action on the ribosome has been described only recently, where these proteins displace the antibiotic from the ribosome. However, some aspects of their function are still unclear. For example, what is the function of the Vga(A) location on a membrane that has been detected in the membrane fraction but not in the ribosomal.

In this work, using fluorescence microscopy, I observed subcellular localization of the Vga(A)$_{LC}$-mEos2, Vga(A)$_{LC}$-GFP and Msr(A)-eqFP650 resistant fusion proteins in live cells of *S. aureus* under different culture conditions . It has been shown that Vga(A)$_{LC}$-GFP and Msr(A)-eqFP650 occur in a foci near the membrane. Depending on ATPase activity or the presence of an antibiotic, the localization of Msr(A)-eqFP650 in the cell changes from focal to diffuse, presumably on ribosomes, suggesting a hypothesis about the dual mechanism of ARE ABC-F proteins. The second aim of this work was to monitor *in vivo* expression of Vga(A)$_{LC}$ in clinical isolates of *S. haemolyticus*. Vga(A)$_{LC}$ expression has been shown to be controlled depending on the presence of a specific antibiotic bound to the ribosome by a mechanism known as transcriptional attenuation. Moreover the expression is specifically induced by antibiotics to which the protein confers resistance.

Key words: ABC proteins, ARE proteins, antibiotic resistance, Vga(A)$_{LC}$, Msr(A), subcellular localization, *Staphylococcus aureus, S. haemolyticus*