Imprimir Resumo

1467-1 Resource Sharing by Outer Membrane Vesicles from a Citrus Pathogen

Autores:

Gabriel Guarany de Araujo (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo) ; Matheus Conforte (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo) ; Aline Purificação (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo) ; Iris Todeschini (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo) ; Edgar Llontop (IQ-USP - Instituto de Química, Universidade de São Paulo) ; Claudia Angeli (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo) ; Alex Inague (IQ-USP - Instituto de Química, Universidade de São Paulo) ; Marcos Yoshinaga (IQ-USP - Instituto de Química, Universidade de São Paulo) ; Robson de Souza (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo) ; Rodrigo Papai (IPT - Instituto de Pesquisas Tecnológicas do Estado de São Paulo) ; Maciel Luz (IPT - Instituto de Pesquisas Tecnológicas do Estado de São Paulo) ; Sayuri Miyamoto (IQ-USP - Instituto de Química, Universidade de São Paulo) ; Giuseppe Palmisano (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo) ; Chuck Farah (IQ-USP - Instituto de Química, Universidade de São Paulo) ; Cristiane Guzzo (ICB-USP - Instituto de Ciências Biomédicas, Universidade de São Paulo)

Resumo:

The causative agent of citrus canker disease, *Xanthomonas citri* pv. *citri*, was found to produce copious amounts of outer membrane vesicles (OMVs), frequently forming long membranous tubes under different culture conditions. These structures were investigated by negative stain transmission electron microscopy and cryoelectron microscopy, revealing details of their organization as vesicle chains transitioning into tubes with a continuous lumen. The OMVs were purified by density gradient ultracentrifugation and characterized by multiple techniques. Lipidomic analysis revealed significant differences in lipid composition between purified vesicles in relation to whole cells. The results suggest an enrichment in saturated cardiolipins and a decrease in unsaturated lipids in the OMV samples, possibly granting them a more rigid structure while allowing their high degree of curvature caused by their small diameters. The vesicles' proteome was found to be significantly enriched in TonB-dependent receptors related to the acquisition of different nutrients. These proteins are known to transport siderophores, which were evidenced to be present in purified *X. citri* OMVs, along with essential metals including iron, zinc, and manganese quantified by elemental analysis. The availability of vesicle-associated nutrients to be incorporated by cells was demonstrated by the use of OMVs as the sole carbon source for bacterial growth. At last, the vesicles also presented esterase and protease activities, which have been associated with virulence in phytopathogens. These evidences point that *X. citri* cells can use OMVs to share resources within microbial communities, which has potential implications for microbial interactions and plant colonization, affecting their survival and persistence on the host and in the environment.

Palavras-chave:

outer membrane vesicles, Xanthomonas, proteomics, esterase

Agência de fomento:

FAPESP, CAPES, CNPq