Summary

Legionella bacteria are widely distributed in natural freshwater environments and artificial water systems both as free-living bacteria that are part of complex biofilm structures and primarily as intracellular pathogens of eukaryotic organisms. Adaptation to such extremely different conditions as the aquatic environment, poor in nutrients, and the interior of the host cell, rich in food, requires the activation of several mechanisms by these bacteria. In specialized interactions with host cells, *Legionella* bacteria use lipids. *Legionella* lipids play essential structural functions that stabilize cell membranes and function as virulence factors, antigens, or molecular patterns recognized by the host's immune system. As in the case of proteins, *Legionella* bacteria can adapt the composition of membrane lipids in response to changing environmental conditions. *L. gormanii* synthesizes glycerolipids (triglycerides and diglycerides), phospholipids (phosphatidylethanolamine, PE, phosphatidylcholine, PC, cardiolipin, CL, phosphatidylglycerol, PG), and sphingolipids (ceramides and hexosylceramides). The use of methods based on the chemical analysis of structural markers of the cell envelope allowed demonstrating that the membranes of *L. gormanii* contain compounds that characterize various *Legionella* species, such as PE15:0_15:0 and PC15:0_16:0. On the other hand, PEcyclopropane17:0_16:0 and PCcyclopropane17:0_15:0 may be chemotaxonomic determinants of the *L. gormanii* species. The ability to use extracellular choline and synthesize PC in a one-step pathway catalyzed by phosphatidylcholine synthase confirmed for *L. gormanii* indicates that this process is common to different *Legionella* species. PC synthase may be a promising therapeutic target to impair the intracellular proliferation capacity of these pathogens. *L. gormanii* cultured on a medium with exogenous choline modifies the content and distribution of lipids in membranes, which affects its physicochemical properties and determines the sensitivity of these bacteria to the killing effect of apolipophorin III isolated from the hemolymph of *Galleria mellonella*.

Keywords: *Legionella gormanii*, Legionnaires' disease, lipids, apolipophorin III, *Galleria mellonella*

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