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Effect of temperature on *Pseudomonas* phospholipid composition

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Introduction

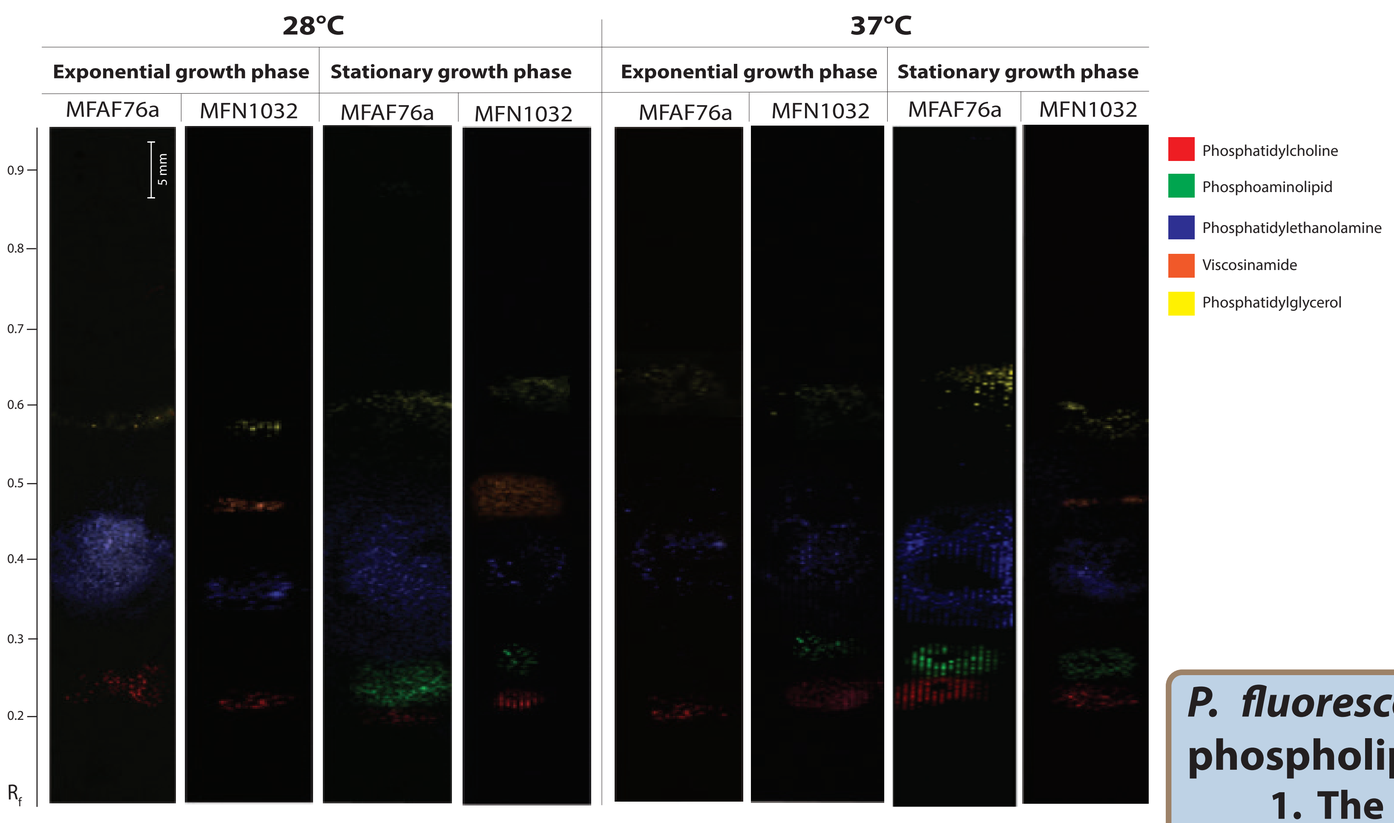
Pseudomonas are present in all natural environments, and able to quickly adapt to environmental modifications. Physiologically, this adaptation depends essentially to the structure and organization of their envelope. The membrane functions are traditionally attributed to proteins that are immersed in the lipid bilayer, but lipids are not only a matrix to accommodate proteins, but play a major role in bacterial functioning. *P. fluorescens* is a psychrophilic bacterium commonly found in soil and water. Some of *P. fluorescens* members are able to growth at the human temperature, as members of the skin microbiota or behave as opportunistic pathogens.

Objectifs

Characterization of the phospholipid composition of *P. fluorescens* using an adapted HPTLC-MALDI-TOF MS Imaging tool
Establish if the response to human temperature involves changes in the structure and the composition of *P. fluorescens* phospholipids at different phases of growth
Study of lipidomes of two *P. fluorescens* strains from different ecological niches: one clinical isolate MFN1032 and one airborne isolate MFAF76a

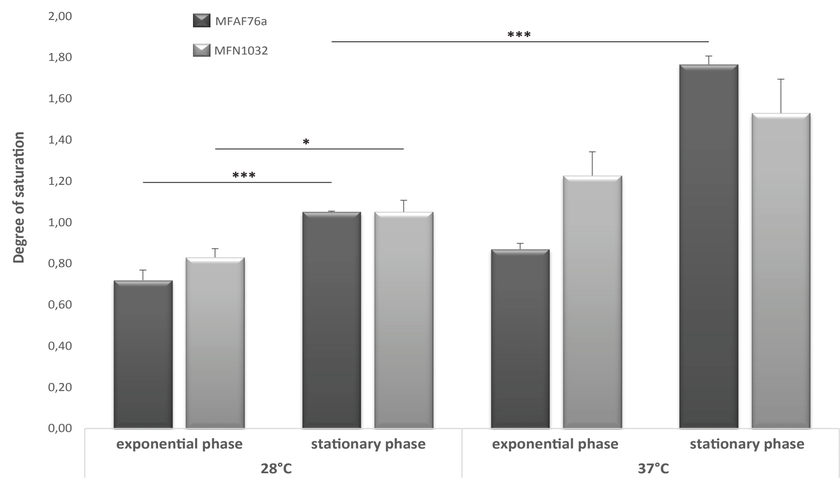
1. Adaptation of *P. fluorescens* to human temperature by membrane phospholipid modifications

Temperature and phospholipid composition



At 37°C the both strains product more zwitteronic phospholipids, like phosphatidyléthanolamine and phosphatidylcholine

Temperature and degree of fatty acids' saturation



To adapt to human temperature the degree of fatty acids' saturation increases in both *P. fluorescens* strains

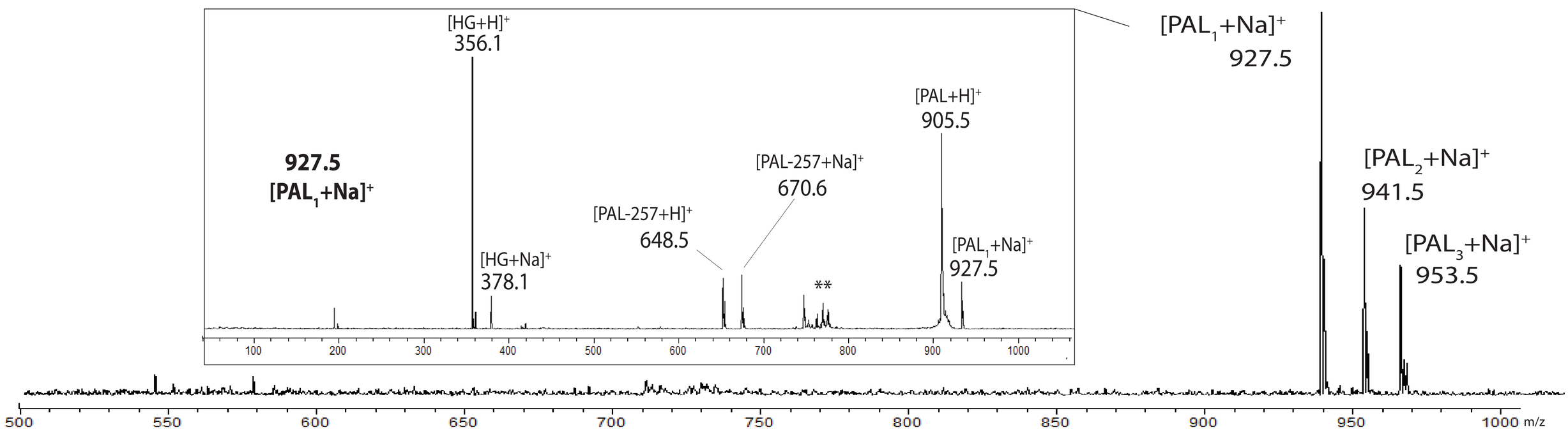
P. fluorescens adapts to temperature changes via membrane phospholipid modification.

1. The overproduction of zwitteronic phospholipids allows the changes of membrane charge

2. The phosphatidylcholine overproduction may be involved in _P. fluorescens_ - host interactions.

3. The increasing of degree of fatty acids' saturation allows _P. fluorescens_ to keep the optimal membrane fluidity

2. New phospholipid class identification



Conclusions

P. fluorescens is able to adapt to human temperature using two lipidic pathways:
1. the increasing of degree of fatty acid unsaturation controls the membrane fluidity
2. the increase of the synthesis of zwitteronic phospholipids results in the membrane charge changes.

Open questions

1. The phosphatidylcholine role in *Pseudomonas* adaptation to human temperature
2. The new lphospholipid class PAL complet identification