

The RNA-binding protein PNPase is a novel regulator of biofilm formation and virulence in *Listeria monocytogenes*

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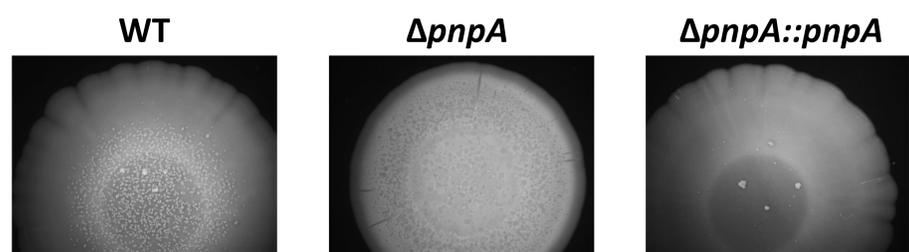
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Background

- Polynucleotide phosphorylase (PNPase) is an important 3'-5' exoribonuclease involved in RNA processing and degradation
- *Listeria monocytogenes* is a Gram positive foodborne human pathogen
- Biofilms are aggregates of adherent microbial cells that are enclosed in a matrix of extracellular polymeric substances (EPS)
- During infection, biofilms allow bacteria to be more resilient to both the immune system and antibiotics
- Finding novel biofilm and virulence regulators may contribute to develop new strategies to fight infections

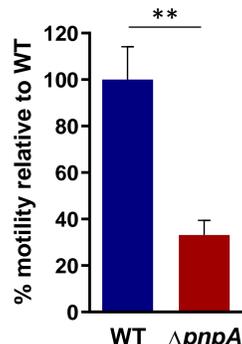
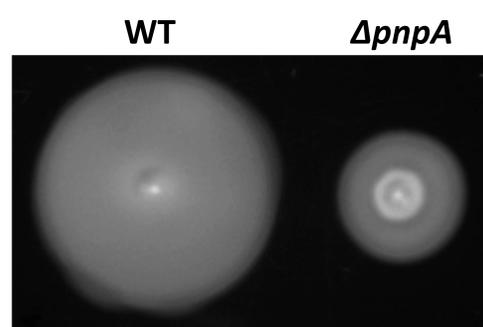
Results

1. Macrocolonies



ΔpnpA has a regular rim and a different morphotype

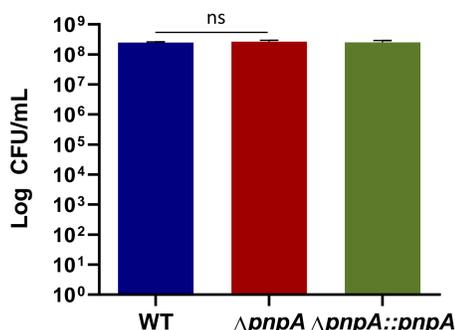
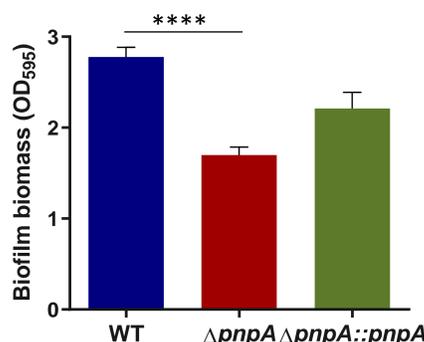
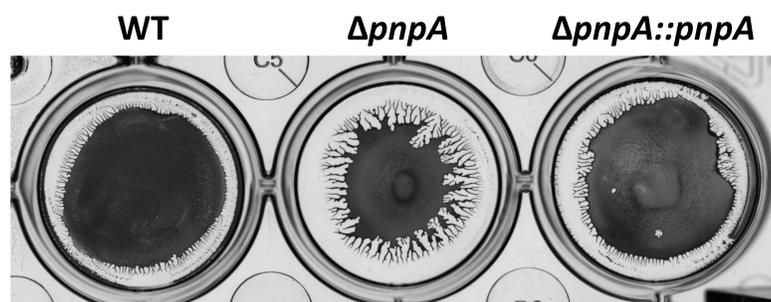
2. Motility



Swimming is impaired in PNPase mutant

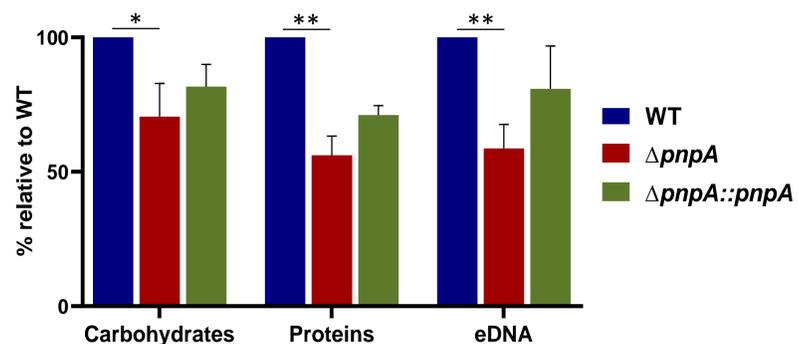
PNPase null mutant shows phenotypes commonly associated with defective biofilms

3. Biofilm formation



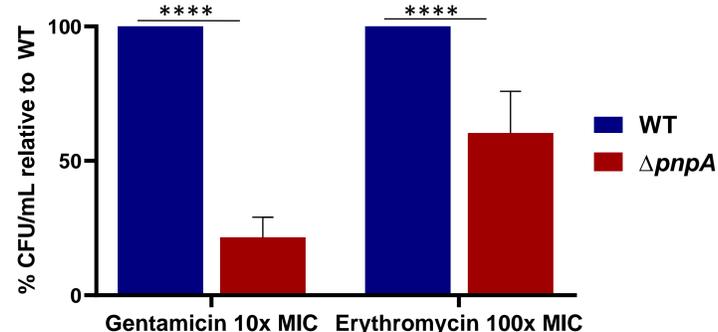
ΔpnpA is defective in biofilm formation and shows a distinctive morphology; no differences in viability

4. Matrix components



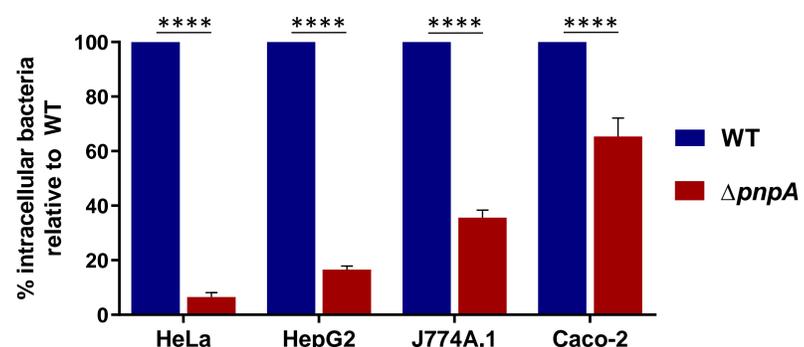
ΔpnpA has less 30-40% of the matrix constituents

5. Biofilm eradication by antibiotics



ΔpnpA biofilm is more susceptible than WT

6. Invasion of mammalian cells



Inactivation of PNPase impairs the invasion of epithelial and phagocytic cells

Conclusions

PNPase from *Listeria monocytogenes* is important for:

- Motility
 - Biofilm formation
 - Cellular invasion
- Matrix appears to be defective, which could cause biofilms to be less resistant to antibiotics