The infection biology of pig-associated Salmonella

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Introduction

- 21.2% slaughter pigs positive for *Salmonella* in UK
- 9,670 human cases of salmonellosis in 2011
- Persistent infection in food animals → background level of human cases
- Pigs & pork considered a significant source of human infection across Europe
Monophasasics

- Epidemic and multi-drug resistant strains
- Characterised by lack of phase 1 or phase 2 flagellin
- Pigs are the main reservoir
- Many different variants

1,4,[5],12:i:-
1,4,[5],12:-
:1,2
Monophasics

2007

- Typhimurium, 1: 3%
- Typhimurium: 1%
- Bovismor: 3%
- Kedouis: 3%
- London: 4%

2011

- Typhimurium, 1,4,5,12:i:-: 24%
- Typhimurium: 12%
- Bovismor: 2%
- Kedouis: 2%
- London: 2%
- Typhimurium: 47%
Flagellin

epithelial cell

TLR-5

IL-8

• Motility

• PAMP
Methods (1)

- Gentamicin-protection assay
  - grow IPEC-1 cells to confluence
  - infect with *Salmonella*
  - apply antibiotic
  - lyse cells
  - enumerate internalised bacteria
Results (1)

Internalised bacteria log cfu/ml

IL-8 concentration pg/ml
• Further characterisation of monophasics

  ➡ Motility assay

  ➡ Biofilm assay
Results (2)

Stationary Phase motility after 6 hours

Halo diameter (mm)

DT193 4,12::l−
DT193 4,4,12::l−
DT193 4,5,12::l−
DT193
4/74
SL1344
Results (2)

Biofilm Formation at room temperature after 1

Absorbance 600nm

DT193 4,12:i-  DT193 4,5,12:i-  DT193 4,5,12:i-  DT193 4/74  SL1344
Differential antibody staining

- Differentiate between internalised and external bacteria
- Quantification in the same cells

from S. Humphrey Thesis, 201
Conclusions

• Monophasics possibly evade host inflammatory response

➡ May spread systemically

• Monophasics are motile and able to form a biofilm

• Further characterisation will help inform control strategies
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