



SELECTED OPPORTUNITIES IN INFECTIOUS DISEASES

Diagnosing Escherichia Coli infection (BIO15218)

DIAGNOSING ESCHERICHIA COLI INFECTION (BIO15218)

Stage:
Animal POC

Product factsheet

▶ Biomarker:

- ◆ LM33_P1 polypeptide

▶ Technology:

- ◆ ELISA

▶ Information:

- ◆ Diagnostic

▶ Sample:

- ◆ Blood, Biopsy

▶ Scientific and Clinical Rationale:

- ◆ Amongst the highly diverse Escherichia coli population, the ST131-O25b clone has an uncommon ability to propagate in humans and is highly pathogenic. These clones are also associated with a high level of resistance to β -lactams and fluoroquinolones.
- ◆ The inventors have isolated LM33_P1, a bacteriophage that exclusively infects the ST131-O25b E. coli strain by using its Gp17 polypeptide to attach to the LPS present on the bacterial cell.

▶ POC:

- ◆ Infectious murine models (E. Coli strains, with or without bacteriophage strains)
- ◆ Bacteriophage LM33_P1 decreases bacterial load in mice infected with the ST131-O25b E. coli strain.
- ◆ LM33_P1 binds to LPS present on ST131-O25b.

▶ Selling points:

◆ Priority or Patent:

- ◆ EP16 305 433.1 on 2016/04/13
- ◆ PCT/EP2017/058860 on 2017/04/12

◆ Product:

- ◆ Peptide

◆ Scientific Publication(s):

- ◆ [J Antimicrob Chemother](#), 2016 Nov, *Dufour N. et al.*, Bacteriophage LM33_P1, doi: 10.1093/jac/dkw253

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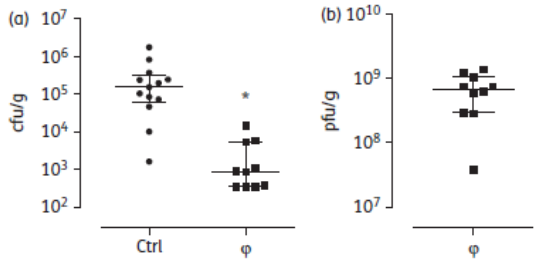
Proof of concept

Subtitle

Schéma du principe si adressable

▶ Animal POC:

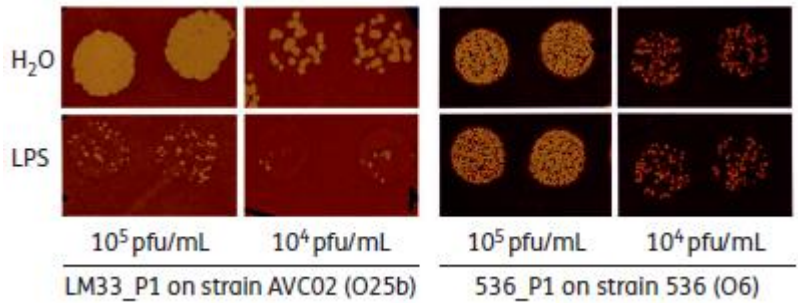
◆ (A) Bacteriophage LM33 P1 efficiently infects its host in vivo.



LM33_P1 activity in a urinary tract infection model. Bacterial (a) and viral (b) counts 48 h post-infection in kidney homogenates of mice infected with 5×10⁷ cfu of strain LM33. Twenty-four hours post-infection, the mice received intraperitoneally either PBS (Ctrl, n¼13) or bacteriophage LM33_P1 (w, moi 200, n¼10). The results are expressed as individual values with medians and IQRs. *P,0.001 compared with the control group.

▶ In vitro POC:

◆ (B) LM33 P1 targets antibiotic-resistant O25b E. coli strains by binding to O25b LPS O-antigen.



O25b LPS extract inhibits bacteriophage LM33_P1 infection: appearance on agar plates. An LPS extract from strain LM33 was mixed with bacteriophage LM33_P1 (left-hand side) or 536_P1 (right-hand side) at two different concentrations (10⁵ and 10⁴ pfu/mL) and assayed on two agar plates overlaid with an O25b strain (AVC02) or an O6 strain (536) as control. Enlargements of these two plates are shown to facilitate the observation.