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# Prophage taming by the adherent-invasive *Escherichia coli* LF82 upon macrophage infection

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Escherichia coli LF82 is an adherent-invasive pathogen (AIEC) frequently found in the gut microbiota from Crohn's disease patients. This bacterium is able to survive and multiply inside macrophages, where it sustains the gut inflammation. In order to see if prophages could be involved in the physiology of E. coli LF82, we first characterized in vitro the five prophages identified in this strain [1, 2]. The most expressed of them, a P22 homologue called Gally, is strongly associated with E. coli strains from Crohn's disease patients [3]. Finally, to further understand the good survival of *E. coli* LF82 in macrophages, we extended the study of its prophages after macrophage infection.

# Escherichia coli LF82 virome

The 5 prophages from *E. coli* LF82 are active



# Are these prophages involved in *E. coli* LF82 virulence ?

E. coli LF82 prophages encode various morons

30 morons identified (after *in vitro* cultures of *E. coli* LF82 in LB and DMEM media, transcriptomic analysis)

Morons	Gally	Cyrano	Tritos	Perceval	Cartapus



## **Gally transduces Perceval morons** Perceval ▶ 90% of Perceval DNA packaged are contained in Gally virions Perceval carries morons (*emrE*, *sitABCD*) E. coli LF82 coordinates Phage/prophage DNA packaged = Bacterial DNA packaged = Bacterial DNA contamination

Macrophages



400

200

## **Conclusions**

The 5 prophages of *E. coli* LF82 are active and form new virions.

Gally is the most abundant of them in *E. coli* LF82 virome. It is induced in presence of genotoxic stress and may be involved in the dispersal of LF82 virulence genes, thanks to its lateral transduction ability [3]. However, in macrophages, the Gally prophage induction is partially repressed in a manner similar to active lysogeny [5].

We hypothesize that this repression of the Gally phage cycle is the result of an adaptive mechanism of LF82 bacteria to regulate the expression of their most induced prophage upon macrophage infection. This may participate to its good survival in macrophages.



### **References**

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