

# Determinant conditions in the gene expression of *Listeria monocytogenes* virulence factors

## Objectives

The objective of this project is to get an approach of the *L. monocytogenes* virulence expression and how it is regulated to allow the pass from a peaceful- and saprophytic- to a pathogenic form.

The willfulness of this study is to find alternatives for the control of *L. monocytogenes* to improve food safety and reduce the risk related to this m.o. in public health.

## *L. monocytogenes* principal virulence factors

Chromosomal location	Gene	Gene product	Function
LIPI-1	hly	Listeriolisin O (LLO)	Lysis of phagosome
	plcA	Phosphatidylinositol phospholipase C	Lysis of phagosome
	plcB	Phosphatidylcoline phospholipase C	Lysis of phagosome
	mpl	Zinc metalloprotease	Mediates PC-PCL synthesis
	prfA	PrfA protein	Necessary for express virulence factors
	actA	Actin-polymerizing protein	Allows intra and extracellular mobility
Outside LIPI-1	hpt	Sugar phosphate transporter	Necessary for intracellular growth
	inlA	Internalin A	Involved in the host cell internalization
	inlB	Internalin B	Involved in the host cell internalization
	inlC	Internalin C	Increases the virulence
	inlJ	Internalin J	Involved in the host cell internalization

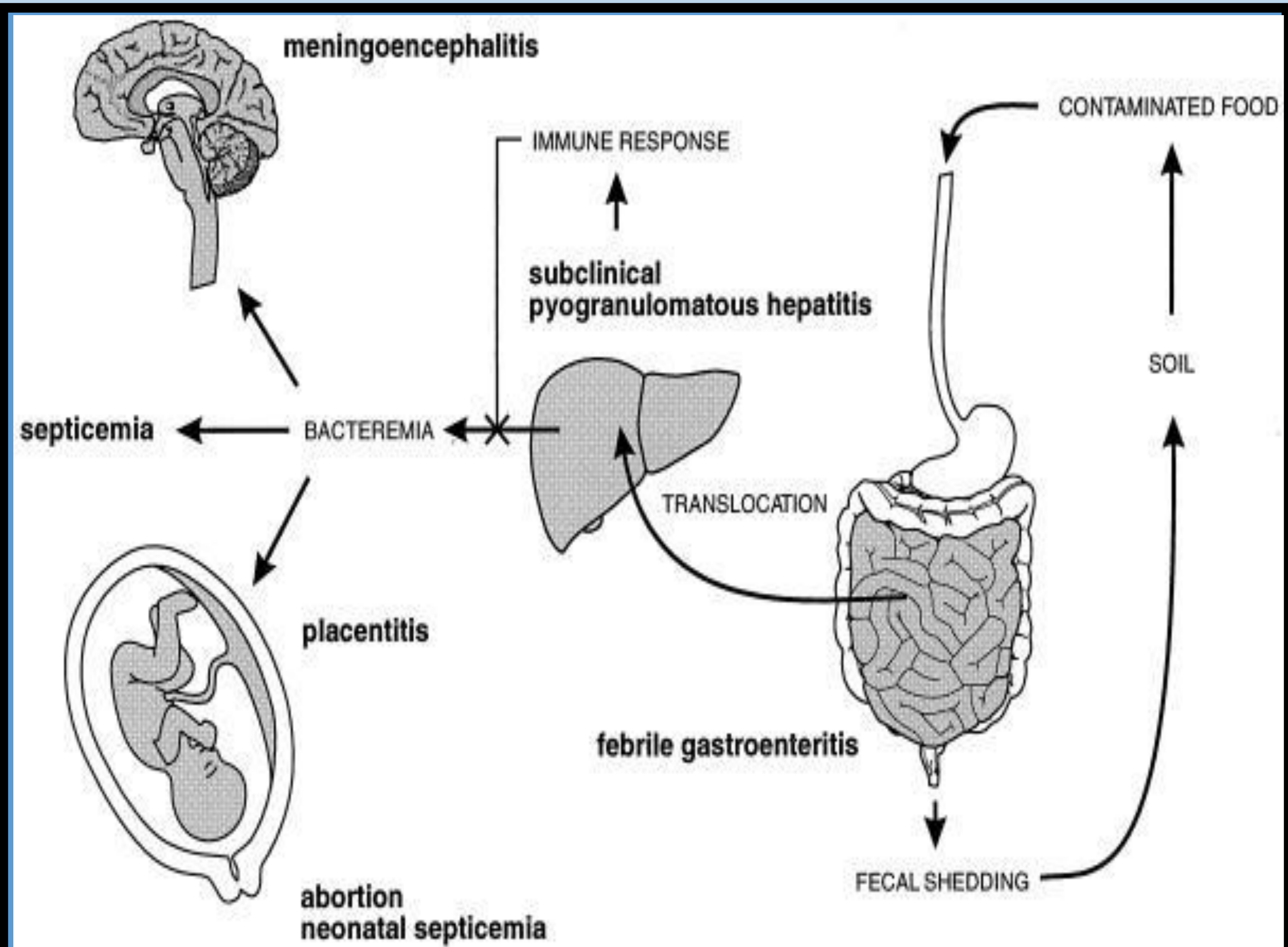


Fig. 1: Schematic representation of *Listeria monocytogenes* infection. Source: “*Listeria* pathogenesis and molecular virulence determinants” (Vázquez-Boland *et al.*, 2001)

Principal virulence regulators

PrfA protein

Increase expression

Sigma  $\beta$  factor

Increase expression

· hly · plcA · plcB  
· actA · inlB · inlC

## Conclusions

- *L. monocytogenes* requires cytosol-like conditions to start replication.
- *L. monocytogenes* demands the prfA gene to be activated to have potential pathogenic activity.
- The RNA sequence that codifies PrfA protein is known.
- It could be possible to act on the new generations produced in the cytosol by blocking RNA sequence that encodes PrfA protein. It would be an antibiotic alternative.
- The blocking element could be a complementary sequence of the so-called PrfA codifying region, introduced with a bacteriophage or a *L. monocytogenes* marker; or a specific RNA chelant.

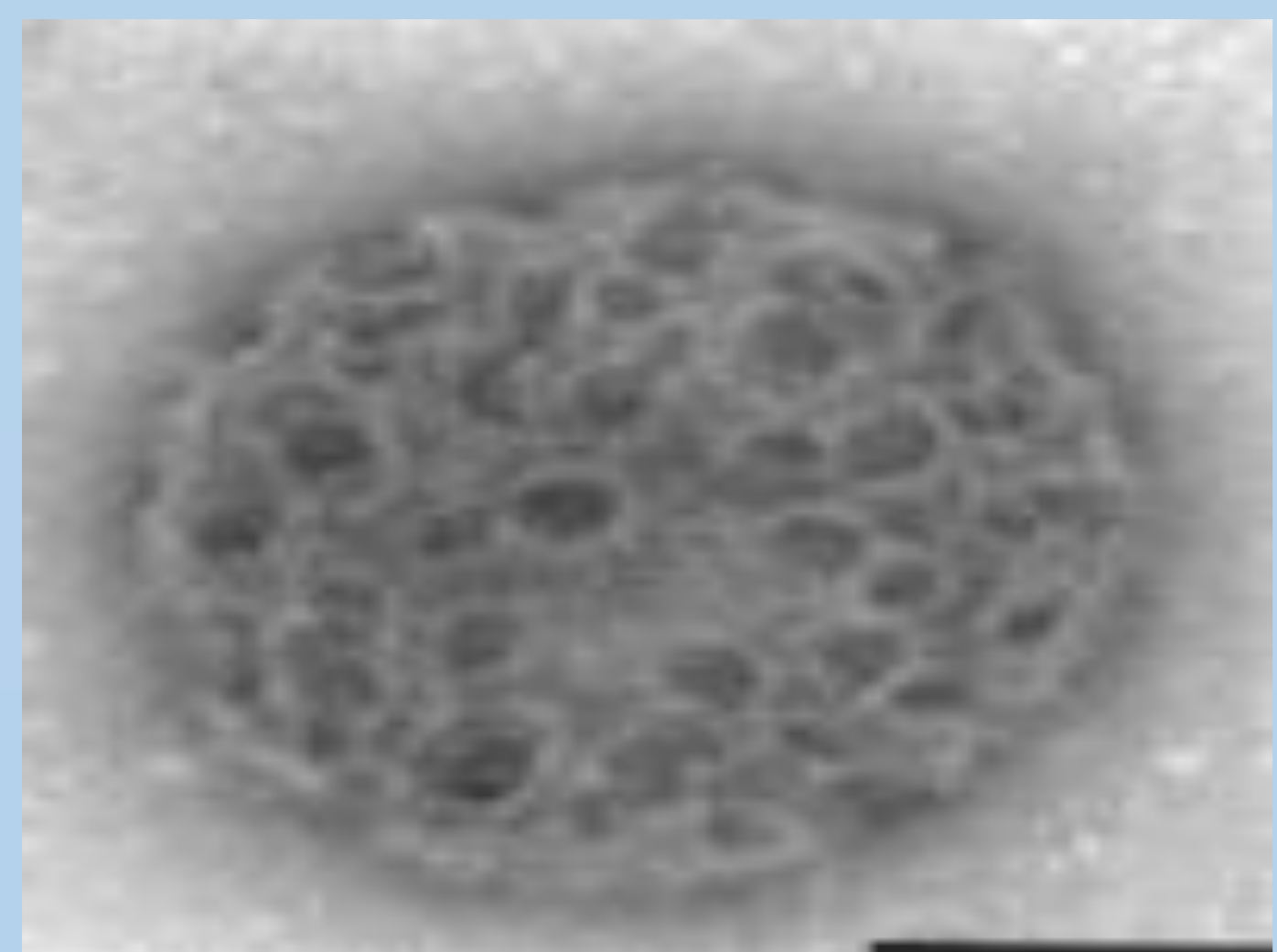


Fig. 2: Pore forming activity of LLO. Source: “*Listeria* Pathogenesis and molecular virulence determinants” (Vázquez-Boland *et al.*, 2001).