

## JOINT EVENT

31<sup>st</sup> Euro Global Summit and Expo on Vaccines & Vaccination

&amp;

4<sup>th</sup> World Congress and Exhibition on Antibiotics and Antibiotic Resistance

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**Nanovaccines to prevent neonatal listeriosis****Carmen Alvarez-Dominguez**

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Clinical cases of neonatal listeriosis are associated with brain disease and fetal loss due to complications in early or late pregnancy, which suggests that microglial function is altered. This is believed to be the first study to link microglial apoptosis with neonatal listeriosis and listeriosis-associated brain disease, and to propose a new nanovaccine formulation that reverses all effects of listeriosis and confers *Listeria monocytogenes* (LM) specific immunity. We examined clinical cases of neonatal listeriosis in 2013–2015 and defined two useful prognostic immune biomarkers to design listeriosis vaccines: high anti-GAPDH<sub>1-22</sub> titres and tumor necrosis factor (TNF)/interleukin (IL)-6 ratios. Therefore, we developed a nanovaccine with gold glyco-nanoparticles conjugated to short LM peptides and formulated with a pro-inflammatory Toll-like receptor 2/4-targeted adjuvant. The neonates born to nanovaccinated pregnant mice's with listeriosis, showed brain and vascular disease and significant microglial dysfunction by induction of TNF- $\alpha$ -mediated apoptosis. This programmed TNF-mediated suicide explains LM dissemination in brains and livers and blocks production of early pro-inflammatory cytokines such as IL-1 $\beta$  and interferon- $\alpha/\beta$ . In contrast, neonates born to nanovaccinated mothers before LM infection, did not develop listeriosis or brain diseases and had functional microglia. In nanovaccinated mothers, immune responses shifted towards Th1/IL-12 pro-inflammatory cytokine profiles and high production of anti-LM antibodies, suggesting good induction of LM-specific memory.

**Biography**

Carmen Alvarez Dominguez has completed her PhD in Immunology, 1993 and has her expertise in listeriosis and *Listeria* based vaccines and nanovaccines for biomedical purposes. Her group has prepared different vaccines for listeriosis, either systemic listeriosis or neonatal listeriosis, using different vectors such as dendritic cells or nanoparticles. Moreover, they have also prepared *Listeria*-based nanovaccines as therapeutic tools for solid tumours. She has built this vaccine expertise after more than 27 years of experience in research, evaluation and teaching in hospital, basic research and academic institutions in Spain and USA. She is also moving recently to consultancy companies to put new vaccines into the market.

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