YERSINIA ENTEROCOLITICA O:3 OUTER MEMBRANE VESICLES – CHARACTERISTICS AND MOLECULAR BASICS FOR INTERACTION WITH COMPLEMENT SYSTEM

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Originating from the outer membrane, outer membrane vesicles (OMVs) contain cell surface structures, including lipopolysaccharide (LPS, endotoxin). Even after eliminating living pathogen cells, those small vesicles are still capable of reaching distant organs and triggering immune response [1].
We investigated OMVs secreted by *Yersinia enterocolitica* O:3 (*Ye* O:3) and their interaction with human complement. The species is responsible for yersiniosis, intestinal disorders and has capacity to survive and multiply in a wide range of temperature (4-40°C) [2]. OMVs were isolated form bacteria grown at 4, 22, 37°C; and from four strains characterised by S, Ra, Rd1 and Re chemotypes of LPS [3]. Their concentrations and size were analysed by DLS, NTA, and TEM. Regardless of the growth temperature and LPS chemotype, OMVs were capable of complement activation, including classical, alternative, and lectin pathways. *Ye* O:3 OMV were recognised by human mannose binding lectin (MBL), but not by ficolins. We have identified the EPS, [→2)-α-D-Man*p*-(1→3)-α-D-Man*p*-(1→6)-α-D-Man*p*-(1→]$_n$, as the ligand recognised by MBL. Proteins, DNA and mannans derived from LB culture medium were excluded as ligands. OMVs activated the THP-1 cells to express mRNA for the IL-8, IL-10, IL-6 and TNF-α genes, what was dependent on lipid A structure and inhibited the killing activity of NHS serum against *Ye* O:3. Treatment of mice with OMVs caused some symptoms of SIRS, that were partially dependent of the complement.
The obtained results confirm the hypothesis that *Ye* O:3 OMVs may serve as a "shield" for the bacteria protecting from the complement system and constitute a strong activator of the inflammatory response, which is important for a better understanding of the development of infections and sepsis.

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