

## ANTIBIOTIC PRESSURE AT SUB-MIC LEVELS SHAPES *BACTEROIDES FRAGILIS*–HOST INTERACTIONS THROUGH VESICLE-MEDIATED IMMUNOMODULATION

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**Background:** *Bacteroides fragilis* is an opportunistic pathogenic bacterium that is part of the normal human microflora. *B. fragilis* produces membrane vesicles (MVs) that play a crucial role in host–microbe interactions and stress adaptation. Antibiotics in subinhibitory concentrations act as a stress factor and are able to change the physiology of *B. fragilis*, which affects the course of infection. *Bacteroides fragilis* secretes membrane vesicles (MVs), which serve as signaling structures, regulate the host immune response and help the bacterium persist in the abdominal cavity.

**Materials and methods:** To study the effect of subinhibitory doses of meropenem, a model of intra-abdominal infection in rats was used. The experimental model of intraperitoneal abscess infection in rats was modified according to the method of Ribeiro de Freitas et al. (2022). The study used 42 male Wistar rats aged 10–12 months with a body weight over 450 g. Animals were divided into negative control (NG), positive control (PG), and experimental (EG, meropenem-treated) groups. The morphology of MVs was assessed by electron microscopy, and immunological and histological parameters were analyzed on the 8th and 16th day after discontinuation of the antibiotic.

**Results:** Meropenem changed the process of vesicular communication, which was accompanied by shifts in the secretion of cytokines, the attraction of immune cells and tissue reorganization. In treated animals, a short-term increase in inflammatory mediators was initially observed, followed by the development of changes associated with fibrosis and neovascularization. This indicates the key role of vesicles as mediators between the antibiotic effect and the host immune response.

**Conclusion:** Subinhibitory doses of meropenem transform the production of *B. fragilis* vesicles into an immunomodulatory factor, creating conditions that can promote chronicity of the infection. Thus, antibiotics can act not only as therapeutic agents, but also as regulators of the interaction between the microorganism and the host organism.

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**Key words:** *Bacteroides fragilis*, sub-MIC antibiotics, membrane vesicles, immunomodulation, chronic infection

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