Functional and immunomodulatory characterization of extracellular vesicles derived from probiotic lactic acid bacteria

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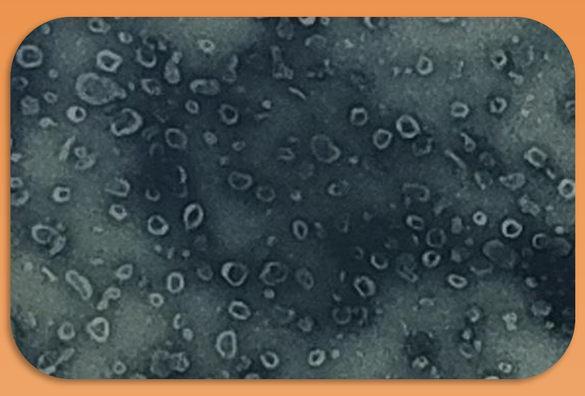


UMR INRAE – L'Institut Agro Rennes-Angers

Science et technologie du lait et de l'œuf

MicroBio team

Microbiology of milk and egg sectors

Keywords

Probiotics Bacteria

Lactococcus lactis

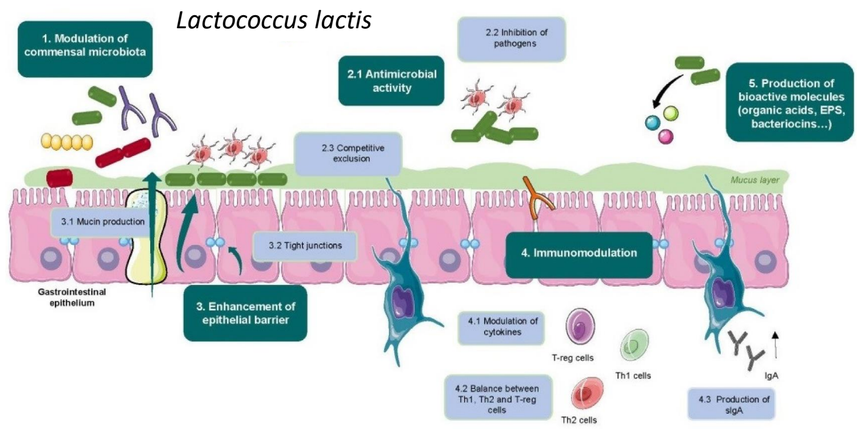
Extracellular vesicles

Characterization

Functions

Socio-economic context

- Lactic acid bacteria (LAB), particularly *Lactococcus lactis*, are essential in the food industry since these microorganisms produce and preserve fermented products (e.g., cheeses, yogurts), improving their organoleptic characteristics and nutritional value
- LAB have also gained interest in recent years as beneficial bacteria due to human health-promoting functionalities such as strengthening the mucosal barrier and modulation of the host's immune system

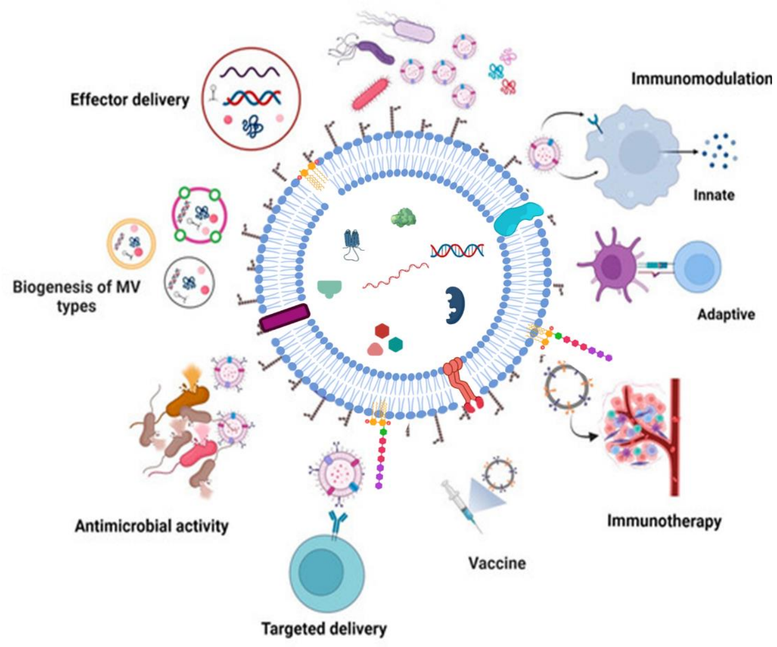


Research question

Does probiotic *Lactococcus lactis* produce EVs and what are their functional and beneficial characteristics to the host?

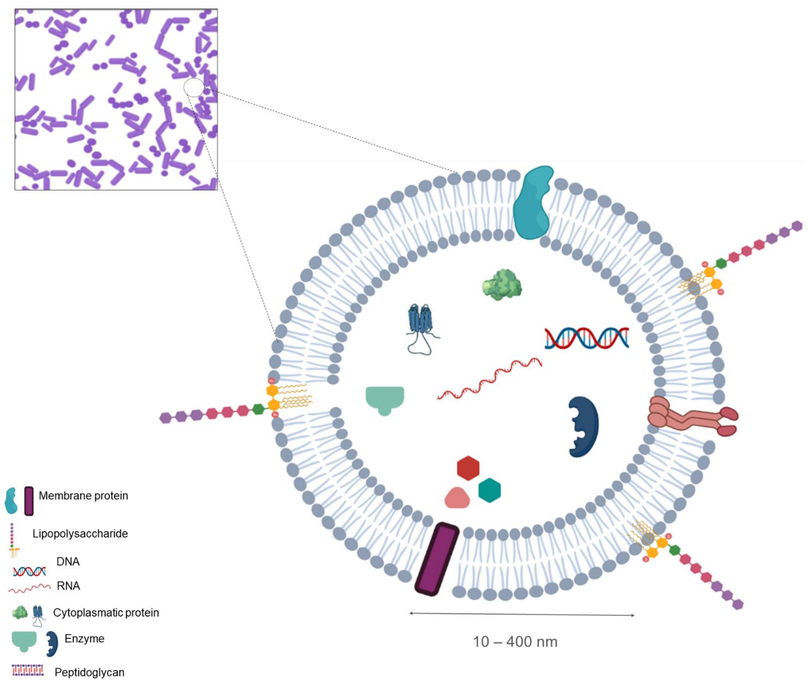
Scientific context

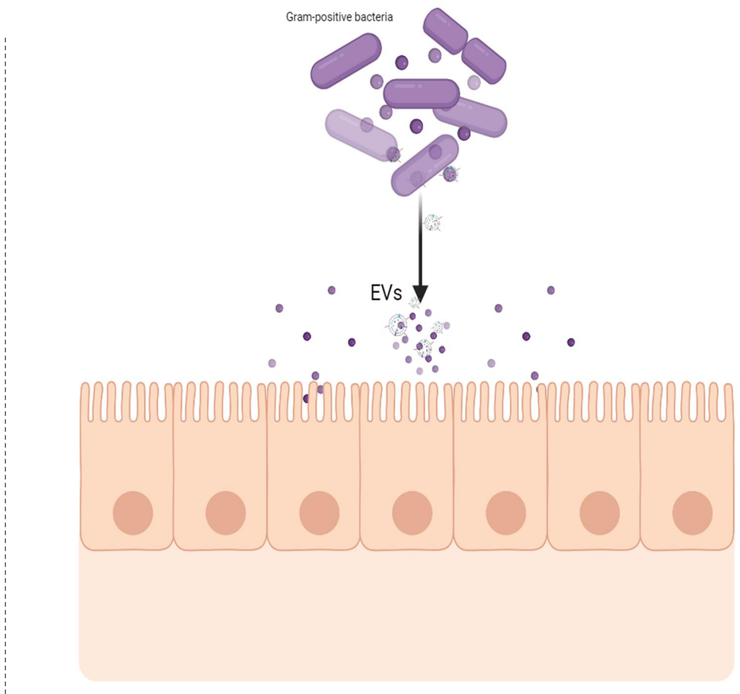
- Extracellular vesicles (EVs) are nanometric particles secreted by cells in all domains of life
- EVs transport biomolecules (proteins, nucleic acids, metabolites) implicated in intercellular communication. The functional properties of EVs are closely related to their cargo
- EVs produced by probiotics display beneficial effects on host cells such as anti-inflammatory activity
- Here, we hypothesize that some *L. lactis* strains produce EVs with anti-inflammatory properties



Expected results

- Confirm the production of EVs by various *Lactococcus lactis* strains
- Characterize these EVs: shape, size, concentration, content, and other physicochemical properties
- Investigate the functionality and benefits of EVs, such as immunomodulation and anti-inflammatory potential *in vitro*





Can EVs from *Lactococcus lactis* interact with cells?

Research Perspectives

- Explore the effects of EVs from probiotic *Lactococcus lactis* strains
- Contribute to the knowledge, functional and biochemical characterization of EVs produced by Gram-positive probiotic bacteria
- Provide molecular and functional data for the use of EVs as delivery vectors of beneficial molecules

Funding

CAPES

Collaborators

UFMG

LGCM Laboratório de Genética Celular e Molecular

STLO

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