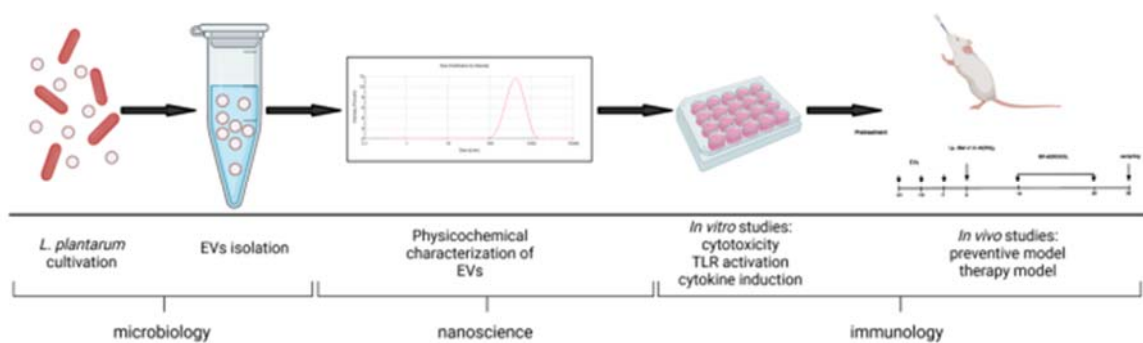


Immunomodulatory properties of *L. plantarum* extracellular vesicles in airway allergy

The aim of the project is to conduct basic scientific research on the immunomodulatory properties of *Lactobacillus plantarum* (*L. plantarum*) EVs in terms of their applicability in the treatment/prevention of airway allergies. *L. plantarum* was already shown to reduce allergy in several animal models and in clinical studies. The project assumes a detailed characterization of vesicles, starting from the description of their physicochemical properties, through in vitro tests using immune and respiratory epithelial cell lines, to in vivo tests on gnotobiotic mouse and mouse models of airway allergy. Additionally, recombinant vesicles containing Bet v 1 allergen will be used to evaluate their applicability in the induction of immune tolerance.



Specific objectives:

- to characterize Wild Type (Lp^{WT} EVs) and birch pollen major allergen enriched EVs (Lp^{Betv1} EVs) of *L. plantarum* in terms of their size, zeta potential, stability, and content;
- to investigate in vitro and in vivo whether EVs of *L. plantarum* (Lp^{WT} EVs) exhibit similar immunomodulatory properties as the parent live bacteria;
- to examine in vitro how Lp^{WT} EVs and Lp^{Betv1} EVs affect airway epithelial and immune cells in terms of cytotoxicity, the profile of induced cytokines, and expressed immune receptors;
- to characterize in vivo the interaction between Lp^{WT} EVs and host in a simplified model (devoid of the influence of other microorganisms and their metabolites) which is a gnotobiotic mice;
- to test in vivo the applicability of Lp^{WT} EVs and Lp^{Betv1} EVs in the prophylaxis and therapy of birch pollen-induced allergy.



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