

## **Cytotoxic effect of proteinaceous postbiotic metabolites produced by *Lactobacillus plantarum* I-UL4 cultivated in different media composition on MCF-7 breast cancer cell**

### **ABSTRACT**

**Aims:** *Lactobacillus* sp. has capability of producing an array of bioactive metabolites that exhibit probiotic effects. Therefore, the objective of this study was to determine the cytotoxicity effect of proteinaceous postbiotic metabolites (PPM) produced by *Lactobacillus plantarum* I-UL4 cultivated in different media composition on MCF-7 breast cancer cell. **Methodology and results:** *L. plantarum* I-UL4 was cultivated in yeast extract and modified de Man, Rogosa and Sharpe broth containing Tween 80 (CRMRS+T80) or without Tween-80 (CRMRS-T80). Human breast adenocarcinoma cell (MCF-7) was employed as cancer cell in this study. Cytotoxicity and antiproliferative effects of PPM were determined using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl Tetrazolium Bromide assay and Trypan Blue Dye Exclusion assay, whereas Acridine Orange/Propidium Iodide staining was employed to determine the cytotoxicity mechanism. PPM produced in CRMRS+T80 exerted cytotoxicity in a time and dose dependent manner that was selective towards MCF-7 cancer cell. Profound cytotoxicity with the lowest IC<sub>50</sub> concentration of 10.83  $\mu$ g was detected at 72 h of incubation, whereas the most potent antiproliferative effect revealed by the lowest viable cell population was observed at 24 h of incubation. PPM cultivated in CRMRS+T80 induced 80.87% of apoptotic MCF-7 cells at 48 h of incubation. **Conclusion, significance and impact of study:** PPM of *L. plantarum* I-UL4 cultivated in different media composition induced different levels of MCF-7 cancer cell death. The percentage of apoptotic MCF-7 cells treated with PPM cultivated in CRMRS+T80 increased significantly ( $p < 0.05$ ) from 24 to 48 h of incubation. The results obtained in this study have revealed the potential of PPM produced by *L. plantarum* I-UL4 as human health supplement and as anticancer preventive agent.

**Keyword:** Breast cancer; Cytotoxic effect; *Lactobacillus plantarum* I-UL4; Media composition; Proteinaceous postbiotic metabolites