



كلية الزراعة  
قسم الميكروبيولوجيا الزراعية

## ABSTRACT



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### البحث الثالث

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Title	Functional Low-fat Set Yogurt Enhanced with Microbial Exo-polysaccharides-mediated Anticancer Activity.				
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## ABSTRACT

Exopolysaccharides (EPSs) are novel functional additives for low-fat yogurt. Pharmaceutical, medical, and food industries are using more LAB-based EPSs. In this study, *Leuconostoc* spp. Was used to produce ninth bacterial EPSs in a modified molasses medium. Production of EPSs was concentration-dependent on all strains and the highest yield was obtained from the S3 strain (55.23



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g/l), followed by S6 (49.95 g/l), S8 (45.68 g/l), and S7 (44.23) , respectively. HPLC and FTI R analysis showed that all purified EPSs from *Leuconostoc citreum* (S3) and *Leuconostoc holzaapfelii* (S8) were related to exopolysaccharide glucan. Anticancer activity of all EPSs samples (EPSs1-9) against Caco-2 cells and normal MCR-5 cells were investigated using MTT assay. The results revealed that Caco-2 cells were more sensitive than the normal MCR-5 cells. The highest anticancer activity against Caco-2 cancer cells was recorded for EPS8 (IC<sub>50</sub> = 22.94 µg/ml, SI=3.73), followed by EPS3 (IC<sub>50</sub> = 36.15 µg/ml, SI=8.72), EPS1 (IC<sub>50</sub>= 50.01 µg/ml, SI=3.73), and EPS4 (IC<sub>50</sub> = 94.90 µg/ml, SI=3.26), respectively. The lowest cytotoxicity was recorded for EPS5 (IC<sub>50</sub> = 130.5 µg/ml). The most active EPSs (EPS3 and EPS8) were used as fat replacements and stabilizers in low-fat set yogurt at non-toxic concentrations (0.4, 0.8, and 1.2%). EPS3 and EPS8 improved the low-fat yogurt's organoleptic and rheological properties. EPS8 had the highest water holding capacity (77.26%), viscosity (3660 CP), and lowest syneresis (22.95%) and whey off (0.6 ml). Low-fat set yogurt enhanced with EPS3 and EPS8 recorded the highest sensory evaluation values with overall acceptability, especially EPS3b, EPS3c, EPS8c, and EPS8b; the total score point of 97.50, 97.43 ,96.51 ,and 96.36, respectively in fresh age compared to control yogurt (92.64). In conclusion, *Leuconostoc* EPSs, especially EPS8, can be explored for anti-cancer effects on Caco-2 colorectal cancer cells. It could also improve the rheological and organoleptic qualities of low-fat set yogurt.