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The Effect of *Staphylococcus aureus* Exopolysaccharides of Biofilm Extract on Apoptosis Induction in LNCaP Prostate Cancer Cell Lines

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ABSTRACT

Background: One of the most prevalent solid tumors in men is prostate cancer which is caused by a lack of apoptosis, which leaves cancerous cells that refuse to die. Consequently, triggering apoptosis is a common approach for anticancer treatments to destroy tumor cells. The bacterial biofilm's EPS (Exopolysaccharides) is paying attention as a potential novel cancer treatment source.
Methods: This study targeted to determine the anti-cancer capabilities of EPS extract and its impact on the expression of the genes Bcl-2, Bax, p53, caspase3, and caspase9 in the prostate cancer cell line (LNCaP).
Results: Treatment of LNCaP cells with EPS extract caused a significant increase in the expression rate of the apoptosis genes and behavior LNCaP cells were driven toward cell death.
Conclusion: According to the obtained result the bacterial EPS shows promising results to be considered as an anticancer drug for prostate tumors.
Keywords: *Staphylococcus aureus*, Exopolysaccharides, EPS, LNCaP cells, Caspase3, Casapase9

INTRODUCTION

Prostate cancer (PCa) is the second most common solid tumor in men and the fifth cause of cancer mortality (1). Hormone-ablation therapy often has an initial positive effect on prostate cancer patients, but later, the disease becomes androgen-independent and resistant to further treatment (2). Although local surgery, chemotherapy, RT, endocrine therapy, and the use of monoclonal antibodies have improved the prognosis, there are still large numbers of patients at risk of relapse and death (3). Bacterium-mediated cancer therapy (BMCT) has attracted much attention because of its considerable benefits (4). Bacteria has been studied as a potential cancer treatment for over a century (5). William B. Coley, a bone surgeon, first reported that injection of a preparation of heat-killed Streptococcus pyogenes could induce tumor regression in patients with bone and soft tissue sarcoma could experience tumor regression by injecting a preparation of heat-killed Streptococcus pyogenes (6,7). These days,

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