## عنوان مقاله:

The Construction of Carbon Nanotubes Containing an Anti-Bacterial Chemical Component and its Effect on MDR and XDR Isolates of Pseudomonas Aeruginosa

## محل انتشار:

مجله گزارش های بیوشیمی و زیست شناسی مولکولی, دوره 9, شماره 1 (سال: 1399)

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## خلاصه مقاله:

Background: Pseudomonas aeruginosa is an opportunistic human pathogen that causes severe acute and chronic nosocomial infections, especially in immunocompromised burn patients. and can lead to severe mortality and morbidity. The emergence of antibiotic resistant P. aeruginosa infections has created significant challenges in treating these patients. A potential alternative treatment for antibiotic resistant pathogens includes the use of carbon nanotubes (CNTs), which have received considerable attention due to their potent antibacterial activity. The aim of this study was to construct a novel CNT containing an anti-bacterial chemical component to effectively combat drug resistant P. aeruginosa infections. Methods: In this study, a novel chemical component was synthesized and coated the CNT. The antimicrobial effects were then evaluated on MDR, XDR, and PDR strains of P. aeruginosa isolated from burn patients. Antibiotic susceptibility was evaluated using the disk diffusion test and minimum inhibitory concentration (MIC) testing. In order to determine the potential cytotoxicity, an MTT assay was performed on Human Dermal Fibroblasts. The effect of treatment on the expression of wound healing genes was analyzed via qRT-PCR. Results: Experimental data indicates that our CNT coated chemical compound had antibacterial properties, negligible cytotoxicity, and could accelerate the wound healing process. Conclusions: Given the antibacterial properties of our CNT chemical compound, it has the potential to treat and reduce the occurrence of multi-drug resistant P. aeruginosa burn wound infections and aid in wound healing by turning on genes (VEGFA, EGF and PDEGF) involved in the wound healing process.

## کلمات کلیدی:

Anti-Bacterial drugs, Drug resistance, Nanotubes Carbon, Pseudomonas aeruginosa, MDR, XDR.