

ABSTRACT

Microbial infections are becoming very common and bacterial resistance to antibiotics causes a significant challenge to health systems globally by imposing massive financial burdens. Biofilms formation is another bacterial regulation strategy that helps them to survive the effects of antimicrobials. Finding antibiotics substitutes with better antibacterial activity and lower risks are highly desired. The application of ALGs in wound dressings has been high due to its high-water absorption, long-release, enhanced porosity and non-immunogenicity. Because of its superior biosafety, antimicrobial qualities, and healing effects on wounds, arginine has been researched as a bioactive component in recent years. So, in current research, arginine loaded alginate membranes with two different concentrations were prepared. The synthesized membranes were found to be cytocompatible in cell culture study against fibroblasts that was also confirmed by live/dead assay. These showed remarkable antibacterial activity against both Gram-positive (*MRSA*) and Gram-negative (*P. aeruginosa*) bacteria. *Pseudomonas aeruginosa* and *MRSA* biofilms were significantly decreased when exposed to membranes for 24 hours. Overall, these membranes exhibited excellent antimicrobial activity and holds a considerable potential to alleviate the current antibiotic resistance crisis in chronically infected wounds and expected widespread use in clinics.