

# Jordan University of Science and Technology

## Study of the antibacterial and antifungal activities of synthetic benzyl bromides, ketones, and corresponding chalcone derivatives

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**Abstract:** Abstract Several applications of chalcones and their derivatives encouraged researchers to increase their synthesis as an alternative for the treatment of pathogenic bacterial and fungal infections. In the present study, chalcone derivatives were synthesized through cross aldol condensation reaction between 4-(N,N-dimethylamino)benzaldehyde and multiarm aromatic ketones. The multiarm aromatic ketones were synthesized through nucleophilic substitution reaction between 4-hydroxy acetophenone and benzyl bromides. The benzyl bromides, multiarm aromatic ketones, and corresponding chalcone derivatives were evaluated for their activities against eleven clinical pathogenic Gram-positive, Gram-negative bacteria, and three pathogenic fungi by the disk diffusion method. The minimum inhibitory concentration was determined by the microbroth dilution technique. The results of the present study demonstrated that benzyl bromide derivatives have strong antibacterial and antifungal properties as compared to synthetic chalcone derivatives and ketones. Benzyl bromides (1a and 1c) showed high ester activity against Gram-positive bacteria and fungi but moderate activity against Gram-negative bacteria. Therefore, these compounds may be considered as good antibacterial and antifungal drug discovery. However, substituted ketones (2a-b) as well as chalcone derivatives (3a-c) showed no activity against all the tested strains except for ketone (2c), which showed moderate activity against *Candida albicans*.