



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**HANAA ALY**



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التوثيق الإلكتروني والميكروفيلم



# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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# جامعة عين شمس التوثيق الإلكتروني والميكروفيلم

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# **The Vaccines and Their Potential Impact on Antimicrobial Resistance**

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(B.V.Sc., Faculty of Vet. Med., Cairo University, 2018)

For

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(Microbiology)

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### Abstract

Antimicrobial resistance (AMR) is now recognized as a major threat to global health. The present work aims to study the role of vaccine against AMR in broiler chickens using live avirulent multi-drug resistant *E. coli* vaccine also, investigate the additive effect of chitosan nanoparticles either as encapsulated or loaded form in another two live inactivated *E. coli* vaccine. Different samples from internal organs were collected from broiler from 10-38 day old. APEC was isolated by conventional culture methods and VITEK@ 2 COMPAT (bioMérieux, France) with prevalence ratio 67.5 %. Genes associated with virulence (*iutA*, *fimC*, and *papC*) were identified by PCR with the prevalence of 84.4%, 74%, and 54.8% of cases, respectively. Concerning antibiotic sensitivity test among the most resistant drugs, the highest rate of resistance was against Ampicillin (AM) (100%), Trimethoprim-Sulfamethoxazole (80%)

Ampicillin-sulbactam (AMS) (78.5), Ceftazidime (CAZ) 75.5%, cefepime (CPM) 74 %. The vaccinal strain was selected to be avirulent and multidrug resistant. Four groups were designed for *E. coli* experimental vaccinal trial. The first was a negative control, the second was chitosan capsulated-antigen, the third was chitosan loaded-Ag, and the last group was immunized with live avirulent strain. Experiment vaccination revealed that antibody titer was measured by indirect ELISA and confirmed results by MAT shows that Only group 2 and 3 Significantly produced the highest response among groups. Also, the recovery of APEC from internal organs was the lowest in group 2,3 in comparison with group 4. It could be concluded that, administration of *E. coli* killed vaccine either loaded or encapsulated with chitosan nanoparticles promoted humeral immune response and antibody production as well as reduced APEC challenge loads. Also, *E. coli* vaccines based on chitosan are therefore a viable alternative to current vaccines for poultry.



*Dedication*

*To My Mum & Dad*

*To my brother Ahmed, sisters Yasmine & Bassant*

*and my friends.*

*Who always be my side whenever I need.*

*Having you in my life is such a precious gift! I feel extremely lucky and privileged*

*Thank you.*

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