



Faculty of science
Microbiology Department

**Metallo- β -lactamase genes as
Determinants of resistance to Carbapenems
By clinical isolates of *Pseudomonas*
*aeruginosa***

Thesis

*Submitted in partial fulfillment for the requirements of the degree of PhD
of Science in Microbiology*

Submitted By

Bassem Aly Mahmoud El- Biao
(M. Sc degree in Microbiology, 2012)

2018



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Supervisors

Dr. Hala Mohammed Abu Shady

professor of Microbiology

Faculty of Science

Ain Shams University

Dr. Ayman Kamal El Essawy

Fellow of Microbiology

Specialized Hospital

Ain Shams University

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**Faculty of science
Microbiology Department**

Name : Bassem Aly Mahmoud El- Biao

Thesis Title: Metallo- β -lactamase genes as Determinants of resistance to Carbapenems By clinical isolates of *Pseudomonas aeruginosa*

This Thesis for PhD. Degree has been approved by the following committee:

Supervisors :

Name	Job	Signature
Prof. Dr. Hala Mohammed Abu Shady	Professor of Microbiology Microbiology Department Faculty of Science - Ain Shams University	
Dr. Ayman Kamal El Essawy	Fellow of Microbiology Specialized Hospital Ain Shams University	

Examiner Committee:

Name	Job	Signature
Prof. Dr. Ragaa Abdu Awad	Professor of Microbiology Microbiology Department Faculty of Medicine for Girls Al Azhar University	
Prof. Dr. Samir Abdel Aziz Ebrahim	Professor of Microbial Genetics Microbiology Department Faculty of Agreculture-Ain Shams University	
Prof. Dr. Hala Mohammed Abu Shady	Professor of Microbiology Microbiology Department Faculty of Science - Ain Shams University	

Approval date : / /2018

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ

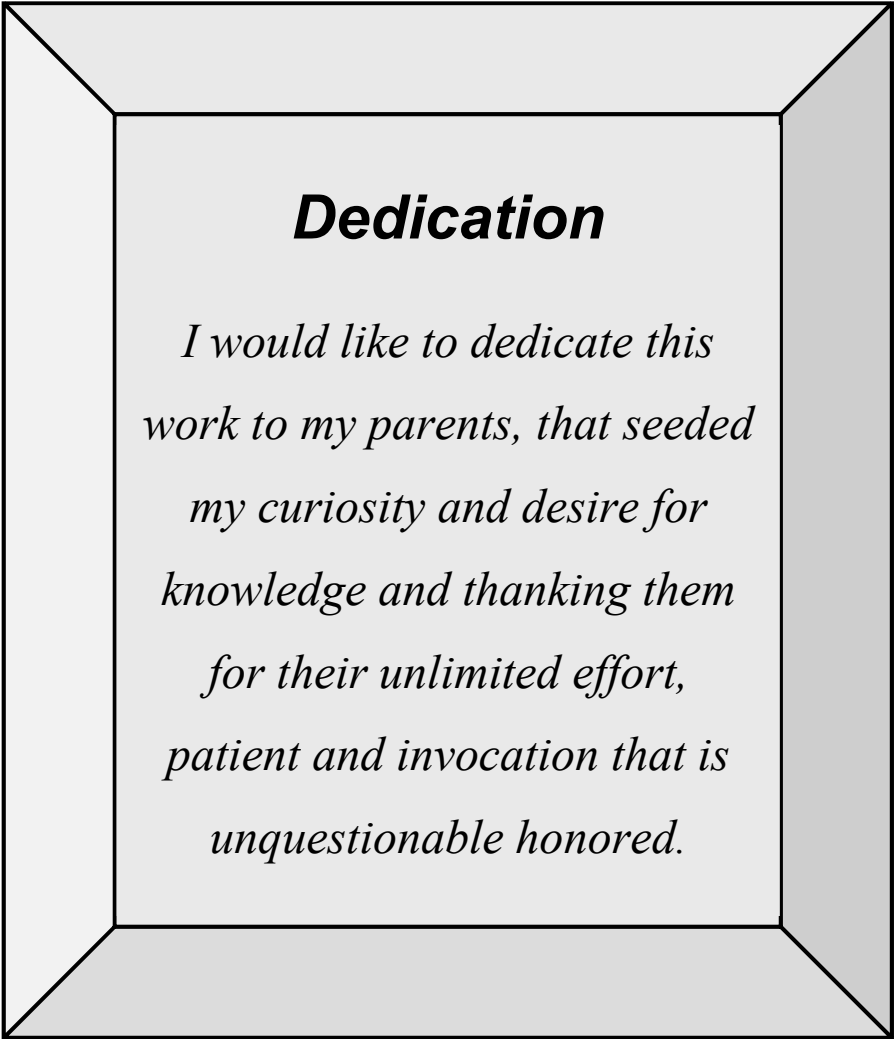
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Dedication

*I would like to dedicate this
work to my parents, that seeded
my curiosity and desire for
knowledge and thanking them
for their unlimited effort,
patient and invocation that is
unquestionable honored.*

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List of Abbreviations

API	Active Pharmaceutical Ingredient
°C	celsius
<i>A. baumannii</i>	<i>Acinetobacter baumannii</i>
BC-GN	Blood culture –gram negative
BC-GP	Blood culture –gram positive
BHI	Brain Heart Infusion
bp	Base pair
BSAC	British Society for Antimicrobial Chemotherapy
C	final concentration of solution
CI	Confidence interval
CLSI	Clinical Laboratory Standards Institute
CNS	carbapenem-nonsusceptible
COSHH	Control of Substances Hazardous to Health
CROs	Carbapenem-resistant organisms
CRPA	Carbapenem-resistant <i>Pseudomonas aeruginosa</i>
CS	carbapenem-susceptible
DIP	Doripenem
DNA	Deoxyribonucleic acid
<i>E. cloacae</i>	<i>Enterobacter cloacae</i>
<i>E. Coli</i>	<i>Escherichia coli</i>
EDTA	Ethylenediamine tetra-acetic acid
ERT	Ertapenem