lasR/rhlR EXPRESSION LINKED TO QUORUM SENSING-MEDIATED BIOFILM FORMATION IN *Pseudomonas aeruginosa* USING GOLD NANOPARTICLES CONJUGATED WITH ETHNOBOTANICAL EXTRACTS

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An Undergraduate Thesis Submitted to the Faculty of the Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines
in Partial Fulfillment of the Requirements
for the Degree of

BACHELOR OF SCIENCE IN BIOLOGY
(Major in Biotechnology)

JUNE 2019

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ABSTRACT

ALEXANDER T. VELASCO JR., Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines, **JUNE 2019, *lasR/rhlR* EXPRESSION LINKED TO QUORUM SENSING-MEDIATED BIOFILM FORMATION IN *Pseudomonas aeruginosa* USING GOLD NANOPARTICLES CONJUGATED WITH ETHNOBOTANICAL EXTRACTS.**

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The rapid emergence of multidrug resistant bacteria endangers the efficacy of antibiotics, which leads to the search of novel anti-infective measures that do not rely in antibiotics. Quorum-sensing inhibition (QSI) presents potentials in making straightforward approach of disrupting cell-to-cell communication in bacteria, thereby decreasing virulence factors such as biofilm formation. To assess QSI of gold nanoparticles conjugated with ethnobotanical extracts (AuNPs + CEs) against *P. aeruginosa*, as a preliminary test, antibacterial activity was assessed and AuNPs + CEs that exhibited antibacterial activity were not used in the biofilm formation assay in order to rule out antimicrobial decrease in biofilm formation. RNA of bacterial sample treated with AuNPs + CEs with biofilm formation inhibitory activity was subjected to gene expression analysis. The results revealed that all AuNPs + CEs used in the microtiter biofilm formation assay showed a significant decrease in biofilm formation in *P. aeruginosa*. Gene expression analysis of *las*R and *rhlR* revealed that AuNPs + CEs that exhibited decrease in biofilm formation also have downregulated expression of *lasR* and *rhlR*, an indication of quorum sensing mediated decrease in virulence. Furthermore, the results showed lower expression of *lasR* in samples treated with AuNPs + CEs, as compared to the previous study and result of gene expression anaylsis of *lasR* in *P. aeruginosa* treated with crude extracts of the ethnobotanicals. This

result presents the role of gold nanoparticles in enhancing the delivery of bioactive compounds present in the ethnobotanicals, with QSI activity against *P. aeruginosa*. Hence, the result offers the potential of AuNPs + CEs in QSI of disease causing human pathogen.

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