

**THERAPEUTIC POTENTIAL OF BACTERIOPHAGE IN TREATING
METHICILLIN RESISTANT *Staphylococcus aureus* BACTEREMIA IN MICE**



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**A RESEARCH PROPOSAL SUBMITTED IN PARTIAL FULFILLMENT OF
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SCIENCE IN INFECTIOUS DISEASES IN THE SCHOOL OF HEALTH
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DECLARATION

This research proposal is my original work and has never been presented for a degree award in any other University.

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Signature.....  Date..... 23/09/2013

We confirm that this proposal was written under our guidance as the University supervisors.

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ABSTRACT

Methicillin resistant *Staphylococcus aureus* (MRS) causes infections in human especially in immunocompromised patients (serious burnt victims or after major surgery). About 80% of nosocomial infections are caused by *Staphylococcus aureus* strains. The emergence of antibiotic-resistant bacterial strains has necessitated the exploration of alternative antibacterial therapies. This study aims at evaluating the ability of bacterial viruses (bacteriophage or phages) to treat mice challenged with MRSA. Phages specific for *Staphylococcus aureus* will be isolated from sewage water, sampled from Dandora sewage treatment plant in Nairobi City. Thereafter, they will be cultured and their therapeutic potential evaluated in an experimental model of staphylococcal induced bacteremia in mice. Mice shall be challenged by intravenous (I.V) inoculation with bacteria (10^8 CFU/ml). A single I.V injection of live phage (10^8 PFU/ml) shall be administered to one group of five mice, while another will receive antibiotics (clindamycin at 8mg/kg body weight) and another physiological saline. These groups shall be compared with a control group that will be inoculated with physiological saline. The mice will then, be observed for 72 hours while collecting data on survival rates. Also, they shall be bled after every 24 hours to determine bacteria titer in their blood. The titer shall be used to evaluate decrease or increase of bacteria C.F.U and phage P.F.U number in the animal body. The mice organs shall be evaluated histopathologically for bacterial and phage damage. The data will be fed into MS office Excel 2007 software for analysis using parametric tests (one way ANOVA and Tukey's *post hoc* test). This work is geared towards production of cheap and efficient alternative antibiotic agents against drug resistant bacteria in livestock and human with an aim of improving human health.