Ayman A Elshayeb, J Antivir Antiretrovir 2014, 6:2
http://dx.doi.org/10.4172/1948-5964.S1.022

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Virology

October 06-08, 2014 Hilton San Antonio Airport, TX, USA

Modelling the prediction of Bacteriophage potentiality as antimicrobial agent against *Salmonella typhi*

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Introduction: Prediction of the bacteriophages' efficiency is the integration of their lytic cycle and experimental results in destroying bacteria with those found in the disciplines of mathematics, statistics and information systems to describe their natural phenomena in order to find the exact numbers of phages that can lysate bacteria.

Objectives: This work was conducted to create a predictive mathematical model for the development of dynamic interactions between a Salmonella phage and its respective host.

Methods: The empirical model was developed from the observations and calculations of bacteriophage replication to solve the distinct mechanisms of Salmonella Typhi by which their efficiency can impact their interactions, including changes in lifecycles, therapeutic dose and mortality rates.Simulated data are compared with the data obtained experimentally to assess the suitability of themodel for multiplicity of infection.

Results: Mathematical models and field observations showed that thestrength and mechanisms of bacteriophage can alter the determination of Salmonella Typhi as antimicrobial therapy. The logarithmic and exponential growth curves solved the replications and interactions of bacteriophage with their host bacteria in certain time decay, the changes in concentrations over time was solved by the differential equations that also were used to determine the therapeutic outcome.

Conclusion: The predicting of the potentiality of lytic phages in lysing Salmonella Typhi can be estimated by using this mathematical model due the experiments environment conditions. Therefore, for more accurate parameter estimationsthe model wassimulated in a programmed MS Excel sheet, it is likely that mathematical modelling could be made to work by changing their values according to the laboratorial experiment conditions.

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