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Development of bacteriophage therapy for novel treatment of antibiotic-resistant bacterial infections

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Since their discovery, antibiotics have become a widely used antidote to bacterial infections. However, the prevalent use of antibiotics and the adaptability of bacteria give rise to antibiotic-resistant bacterial strains. Bacteriophages were discovered at about the same time as antibiotics, but with a few exceptions, their use against infectious bacterial pathogens is not common. The objective of this research effort is to isolate and characterize novel lytic bacteriophages against specific bacterial pathogens that can be used in lieu of or in combination with antibiotics. We chose two pathogenic bacterial species (*Streptococcus pneumoniae* and *Neisseria gonorrhoeae*) for which antibacterial resistance is becoming widespread and is of great public health concern. According to the CDC in the US, *Streptococcus pneumoniae* is responsible for approximately 22,000 deaths annually and the number of *Neisseria gonorrhoeae* infections currently averages approximately 350,000 cases per year. Our sources of bacteriophage populations were water pools located in

Boulder Beach (Nevada), Amargosa Valley (Nevada) and wastewater collected from local treatment facilities in Las Vegas, Nevada. Our approach was to amplify bacteria species-specific bacteriophages from these samples by enriching for those phages able to be amplified through lytic infections of the specific bacteria. DNA sequencing and phage community analyses results suggest that the water samples used in our studies contain numerous bacterial-specific lytic phages.

Speaker Biography

Terry Ann Else has obtained her PhD from the University of Nevada, Las Vegas in 2002. She is an Associate Professor at Touro University Nevada teaching Medical Microbiology/Immunology to medical and graduate level students since 2004. She is board certified as a Clinical Laboratory Scientist. Her research interests include bacteriophage therapy research studying the pathogens, *Streptococcus pneumoniae* and *Neisseria gonorrhoeae*, in collaboration with Associate Professor Karen Duus, PhD also at Touro University Nevada. She has been active in the American Society for Microbiology and served as Regional Planning Coordinator for local ASM branches in the southwestern US and Hawaii.

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