Tablet Composition for Anti-tuberculosis Antibiotics

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Introduction

Bacterial resistance to antibiotics is increasing worldwide creating a global threat. Tuberculosis (TB), caused by the bacterium *Mycobacterium tuberculosis*, is a bacterial infectious disease that results in over one million deaths annually. The discovery outlined here involves a tablet composition for patient administration and subsequently a new paradigm in drug delivery vehicles in vivo and in vitro and is applied to existing TB antibiotics in order to increase their efficacy. The drug delivery system is a three component complex that is administered with the TB antibiotic or a combination of TB antibiotics. The components are a saccharide or saccharides, a transition metal ion or a combination of metal ions that can bind a nitrogen and/or oxygen atom(s), and a water soluble polymer capable of aggregating and enclosing the other constituents. The three component molecular delivery approach has demonstrated ability to overcome *M. tuberculosis* bacterial resistance to an existing antibiotic. FT-ICR MS is used to study the complex. A series of experiments were run with different copper complexes that went through preclinical trials at NIH for work against resistant strains of TB. FT-ICR mass spectral characterization identified complexes that were being synthesized and used in the pre-clinical trials.

Results and Discussion

We demonstrated that certain copper complexes of existing antibiotics can be made to work again against *Mycobacterium tuberculosis*. In particular, it worked against resistant strains of the disease. Both U.S. and International patent applications have been published on-line for this work. We are continuing with the pre-clinical work in collaboration with scientists both in the U.S. and internationally.

![Figure 1. FT-ICR analysis of a copper complex of a modified front line Tb drug.](image)

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Reference