

## 2<sup>nd</sup> International Summit on **Clinical Pharmacy**

December 02-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

### **Inhaled lipid microcarrier for rifampicin intracellular delivery in tuberculosis treatment**

**Valentina Iannuccelli**

University of Modena and Reggio Emilia, Italy

One-third of the world's population is infected with tuberculosis (TB), a disease caused by *Mycobacterium tuberculosis* that survives and replicates within human macrophages. TB is characterized by a long chronic stage of infection and progressive pathology that mainly compromises (90% of cases) the respiratory system (World Health Organization, 2012). The current recommended TB chemotherapy includes: Isoniazid, rifampicin, ethambutol and pyrazinamide. However, patient's non-compliance, several side effects and multi-drug resistant TB infections, often make ineffective the therapy.

The present research was aimed to improve the effectiveness of the treatment by a non-conventional therapy and using the respiratory tract as a novel administration route for rifampicin, a first-line anti-TB drug. This approach involved the design of solid lipid microparticles (SLM) as drug delivery system (DDS) showing benefits in terms of biocompatibility, easy of preparation without organic solvents, long-term stability, low cost of materials and procedures as well as easy of scale-up. The study dealt with the formula optimization in order to provide SLM characterized by physicochemical properties proper for the delivery by a dry powder inhaler (DPI) device, for the targeting to alveolar macrophages and for the drug intracellular activity. SLM (~1 µm) loaded with rifampicin were developed by melt emulsification technique using biocompatible lipids and surfactants. They exhibited suitable breathability, negative surface charge promoting the uptake by the alveolar macrophages, good drug loading level, ability to be taken up by macrophage cell lines and antibiotic intracellular activity. Therefore, the lipid microcarrier proposed could be considered a promising DDS in a perspective of an inhaled therapy for the treatment of TB infection.

#### **Biography**

Valentina Iannuccelli is the Head of a research team developing micro- and nano-carriers as skin, oral and pulmonary drug delivery systems at the University of Modena and Reggio Emilia for more than twenty years. She has been Professor of several courses for the faculty of Pharmacy at the same University. She has published more than 60 papers in reputed journals and it has been associated investigator of the research unit program in nationally relevant projects.

[valentina.iannuccelli@unimore.it](mailto:valentina.iannuccelli@unimore.it)