

## **PhSeZnCl A NOVEL SELENIUM COMPOUND WITH GPx-MIMETIC ACTIVITY: FORMULATION AND IN VITRO CHARACTERIZATION**

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**Purpose.** The aim of the present work is to formulate and characterize in vitro potentially respirable spray-dried microparticles (MP) of PhSeZnCl, a novel compound with GPx-mimetic activity, in order to improve the efficacy of the molecule and reducing the dose-dependent cytotoxicity.

**Methods.** PhSeZnCl was encapsulated in poly(D-L-Lactide) (PLA) polymer by spray-drying with a Buchi B290 spray-dryer; likewise, PhSeZnCl powder was also spray-dried without the excipient. The MP were characterized in terms of size distribution with an accuser C770, encapsulation efficiency by UV-vis spectrophotometry and morphology by SEM. The MP were tested on iMEFS (WT-KO) cells incubated in standard conditions (37°C, 5% CO<sub>2</sub>, DMEM) for 5 and 24 hours and were analyzed for cytotoxicity by MTT assay and morphology by fluorescence microscopy. For this purpose the MP were labeled with FITC.

**Results.** The PLA MP loaded with PhSeZnCl showed spherical shape, narrow size distribution (5.34 µm), and a good content (16.9 ± 0.4%). The PhSeZnCl spray-dried powder had a comparable size distribution (5.48µm) but a more irregular morphology. The in vitro analysis showed that the formulation of PhSeZnCl in MP decreased the toxicity in iMEFS-KO cells, at 4 hours after incubation, respect to the PhSeZnCl spray-dried powder and solutions, while no differences were observed in iMEFS-WT cells. The first studies of fluorescence microscopy showed that the formulation of PLA MP are partially internalized by cells.

**Conclusions.** The formulation of PhSeZnCl in PLA MP seems to be potentially useful to reduce dose and time-dependent toxicity of the compound. Such formulations may have proper characteristics to be administered as a dry powder in the lungs.