## 1 INTRODUCTION

Epilepsy is a neurological disorder, caused by the excessive activity of the cerebral cortex cells, being characterized by the occurrence of seizures with variable intensity and duration. Several investigations in the last few years have highlighted the use of the nasal route for the transport of drugs from the nose directly to the brain (nose-to-brain), mainly because this offers a good alternative to traditional administration methods, because drugs don’t have to pass through systemic circulation to reach the brain. Also the use of nanosystems, such as lipid nanoparticles emerged due to the need to develop new drug delivery systems that would overcome the limitations of traditional dosage forms. There are two types of nanoparticles, solid lipid nanoparticles (SLN) and nanostructured lipid carriers (NLC). The main difference between SLN and NLC is in the internal structure of the nanoparticles.

**Objective:** Develop and characterize an intranasal formulation based on NLC loaded with carbamazepine for the treatment of epileptic seizures.

## 2 METHODS

### 2.1 STUDY OF THE DRUG-LIPID SOLUBILITY

The solubility of carbamazepine in the solid lipid was first tested by heating at 80ºC a mixture of the compounds, for 1h. The existence of lipid-drug solubility was evaluated visually, every 15 minutes, observing the presence or absence of crystals. Absence of crystals indicates solubility between the drug and the lipid. From the results of Table 1, stearic acid and glyceril monostearate were selected as potential solid lipids to prepare the NLC.

### 2.2 STUDY OF LIPID COMPATIBILITY

For this study the lipids chosen previously were tested. The different proportions tested were, 50:50, 60:40, 70:30, 80:20, 90:10 (solid lipid: liquid lipid). The mixtures were heated to 100ºC, with stirring at 200 rpm, for 1 hour. Then they were cooled to room temperature to solidify. Finally, the absence or presence of miscibility was observed. The lipids that showed greater miscibility were oleic acid and glyceril monostearate in the ratio 70:30.

## 3 RESULTS

The size of NLC was measured with Mastersizer 300 (Malvern, United Kingdom), using the laser diffraction technique. The results showed that 90% of the nanoparticles have sizes ≤ 376 nm, being the average size of 93.4 nm. The span factor was 3.75 and indicates some dispersion in the nanoparticles sizes, which can be explained by the need to optimize some experimental parameters of the production method.

## 4 CONCLUSION

The results of this work show the relevance of optimizing the quantities of the components and the production methods of the NLC formulations to obtain particle sizes suitable for the intranasal route and stable during storage. In this sense, more studies are being conducted to obtain NLC of smaller sizes.

## 5 REFERENCES