Development, characterization and pre-clinical evaluation in human neutrophils of nanoemulsion from *Ocimum gratissimum* (Labiatae)

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**Keywords:** nanoemulsion, *Ocimum gratissimum*, neutrophils

**Introduction:** The essential oil from *Ocimum gratissimum* is indicated to treat antimicrobial and anti-inflammatory conditions. A significantly large part of current literature on the encapsulation of essential oils deals with nanometric size which are used for protection of the active compounds against environmental factors. The aim of study was to develop, characterize and evaluate the cytotoxicity in human neutrophils of nanoemulsion from *O. gratissimum* (NEOG).

**Experimental part:** Particle size analysis of nanoemulsion was performed by photon correlation spectroscopy (PCS). Zeta potential was evaluated by Laser Doppler Eletrophoresis (LDE). For pre-clinical tests, human polymorphonuclear cells (2.5x10⁶ cells/mL), mainly neutrophils (80-90%) were exposed to NEOG (10, 50 and 100 µg/mL), HBSS (non-treated), Triton x - 100 (cytotoxic drug) or nanoemulsion without the essential oil of *O. gratissimum* (control) to evaluate lactate dehydrogenase (LDH) activity.

**Result/Discussion:** Particle size analysis indicates that the mean sizes of the different nanoemulsion formulation is 110 nm with polydispersity index 0.052. Zeta potential results show that nanoemulsion, exhibit a negative charge with values ranging from -15.7. The presence of phosphatidylcholine and essential oil affect slightly the zeta potential (P< 0.05). At cytotoxicity assays was observed that incubation with NEOG (1, 50 and 100 µg/mL) did not present increasing LDH activity (2.99 ± 0.28; 2.97 ± 0.34; 3.93 ±0.26 U/L) compared to control (3.13 ± 0.48 U/L).

**Conclusion:** It was observed that NEOG did not promote changes on LDH activity and presents ideal size and stability for nanosystems.

**Financial support:** CNPQ