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is acceptable by the EMA regulations, 50% of the particles are under 100 nm size, they are around the ideal 80 nm even before membrane filtering it. The zeta potentials are the appropriate value, they promise complying stability. Spectroscopic studies showed fast drug release of the formulation.

CONCLUSION: We can conclude Soluplus® is a good excipient for the preparation of polymer micelles. Formulating polimer micelles can improve the solubility of poorly soluble agents, which can be useful for developing "value added" preparations.

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Design and Development of microcarriers for natural drug encapsulation: Statistical validation and optimization of polydispersity index and volume/surface parameters

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INTRODUCTION: Recently, the formulation of natural drugs such as plant extracts and essential oils (EO) has been highly studied due to their multitude bioactivities and their lot off applications from food flavor industry to pharmaceutical and cosmeceutical applications [1].

In aims of Design and Development of EO microcarriers, Ionic Gelation (IG), highly recommended for the encapsulation of hydrophobic bioactive molecules, can be applied and optimized to ensure high drug encapsulation yield with response stability to facilitate its semi-industrial scaling-up [2].

MATERIALS AND METHODS: To obtain EO microcarriers with small particles size and high drug loading capacity, the studied EO was microencapsulated by cross-linking a biodegradable polymer under several experimental conditions. Process optimization was carried out using the Response Surface Methodology to investigate fourth experimental parameters (polymer concentration, cross-linking agent concentration, mixing time and mixing velocity) and the statistical analysis was performed using one-way analysis of variance (ANOVA) and the Mean comparison of Polydispersity Index (PI), volume-weighted mean particle diameter (d43) and Surface Weighted Mean particle diameter (d32) was carried out using T-test [3]. All analyses were repeated in triplicate.

RESULTS: Both the loading capacity and the particles size of the obtained microcapsules were evaluated to optimize the ionic gelation process. Laser diffractometry (Mastersizer 2000, Malvern Instruments Ltd) was used to assess the physical characteristics of the developed microcarriers.

The selected optimal conditions allow obtaining microparticles with a loading capacity of 4.95 to 15.19% with a PI range from 0.852 to 5.695, a specific surface area from 0.011 to 10.1 m2/g, a d32 range of 0.595 to 547.735 μm and a d43 from 5.392 to 714.263 μm. The RSM results combined with the statistical analysis allow assessing the correlation between the fourth experimental parameters and their range on significant (P-value < 0.05) or not significant (P-value > 0.05) effects.

CONCLUSION: Development of microcarriers for EO encapsulation using alginate microspheres was optimized to allow an interesting loading capacity, acceptable particles size, desired polydispersity and suitable volume/surface characteristics. The designed microencapsulation process is statistically validated and can be easily scaling-up to a semi-industrial level.

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Nanostructured lipid carriers for Alzheimer's disease treatment: Influence of solid/liquid lipid ratio on physico-chemical properties

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INTRODUCTION: Novel formulations based on embedded herbal therapeutical moieties into nanostructured lipid carriers (NLC) for nose to brain delivery are promising candidates for multitarget therapy of Alzheimer's disease along with specific and selective delivery to the brain tissue. Given that NLC effectiveness would be determined by their physico-chemical properties, the aim of this study was to investigate the influence of solid/liquid lipid ratio upon them.

MATERIALS AND METHODS: NLC loaded with dry extract of Salvia officinalis L. (SE) were prepared by solvent evaporation method [1]. Lipid phase consisted of phospolipon 90H (kindly donated by Phospholipid, Germany) and oleic acid (Sigma-Aldrich, Germany) in ratio of 1 to 0.216 (NLCS1), 0.433 (NLCS2) and 0.866 (NLCS3). Relative ratio of phospolipon 90H to other NLCs` formulation variables was 1 to 28.67, 0.167, 1.67, 0.3 and 58.7 for ethanol (Alkaloid, Macedonia), SE, tween 80 (Merck, Germany), poloxamer 407 (BASF, Germany) and water, respectively. NLCs` morphology (Jeol-SEM T300, Japan), particle size (PS) and size distribution (PSD) (Mastersizer 2000, UK), zeta potential (ZP) (Nano ZS, UK) and encapsulation efficiency (EE%) (HPLC Agilent 1100, Germany) were determined.

RESULTS: SEM photomicrographs pointed that prepared NLCS were with spherical shape and smooth surface. As they were yellow-green in color DLS technique could not be used for PS and PSD, so laser diffractometry was applied. By increasing the amount of liquid lipid, NLCs` PS increased (132±1.8, 145±0.86 and 257±6.33 nm for NLCS1, NLCS2 and NLCS3, accordingly) most likely related to the higher density of organic solution thus resulting with larger emulsion droplets with lower surfactant surface coverage. Span values indicated narrow PSD for NLCS1 (1.05±0.01) and NLCS2 (1.04±0.06), while NLCS3 PSD (1.93±0.04) was a bit wider. Amount of liquid lipid did not have influence on ZP (-17.3±0.41 mV), contrary to the EE% (NLCS1 - 42.03±1.23, NLCS2 – 48.94±1.85 and NLCS3 – 95.34±2.21%) probably due to the increase of imperfection degree in the solid lipid crystals, thus providing more space for SE encapsulation.

CONCLUSION: Influence of solid/liquid lipid ratio on NLCS physico-chemical properties was determined. Results indicated statistically significant influence on PS and PSD, as well as EE%.

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Determination of Load-Efficieny of Vancomycin in Nanoparticles System

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INTRODUCTION: Vancomycin is a glycopeptide antibiotic which is active against gram-positive organisms. It is used particularly in the treatment and prophylaxis of staphylococcal infections especially caused by Methicillin-resistant Staphylococcus aureus. To eliminate adverse effects such as ototoxicity and nephrotoxicity of vancomycin upon systemic administration, local administration with various drug delivery systems such as microspheres or nanoparticles can be utilized. Chitosan is a polysaccharide produced by N-deacetylation of chitin. Chitosan is biocompatible, biodegradable and non-toxic material. Fucoidan is another polysaccharide obtained from brown seaweeds. It has anticoagulant, antithrombotic, antivirus, antitumor and immunomodulatory, anti-inflammatory and antioxidant properties. Chitosan and fucoidan due to their positive and negative charges in proper media respectively, forms a nanoparticle system in which active pharmaceutical ingredients can be encapsulated. In this study, vancomycin-loaded chitosan/fucoidan nanoparticles were fabricated and for determination of load efficiency of vancomycin, an easy and effective method was developed.

MATERIALS AND METHODS: Nanoparticles were prepared using polyion complexation method. For this purpose chitosan was dissolved in 1% (w/v) acetic acid solution while fucoidan and vancomycin were dissolved in distilled water. Fucoidan solution was then dropped to chitosan solution under magnetic stirring. Nanoparticles were seperated by centrifugation and then freeze dried.

RESULTS: Two methods were tested, UV spectrophotometry where samples scanned at 280 nm wavelength and RP-HPLC method for related substances in European Pharmacopeia monograph for vancomycin with modification.