

## Target-based Pharmaceutical Formulation: Nanostructured lipid carriers for oral delivery of chrysin: Effect of surface modification on absorption

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### Abstract

Chrysin (5, 7-dihydroxyflavone), a natural polyphenol, occurs in many passiflora flowers, along with honey, and propolis. It appears to have a blend of many pharmacological activities such as anticarcinogenic, pro-apoptotic, antiangiogenic, antimetastatic, immunomodulatory, and antioxidant properties. However, therapeutic use of this compound is limited owing to its poor solubility and subsequent low bioavailability. The current studies entail the development and evaluation of novel nanostructured lipidic carriers (NLCs) of 5, 7-dihydroxy flavone i.e., chrysin (CHN). The effect of ligand (biotin) modification on oral absorption of CHN encapsulated in NLCs is also explored. CHN-loaded NLCs (CHN-NLCs) were prepared employing apt lipid and surfactant. NLCs were prepared using melt dispersion-high pressure homogenization method. Biotin modification of CHN-NLCs was achieved by coupling reagents like, EDC and NHS in aqueous phase. The obtained biotin-decorated CHN-NLCs (BIO-CHN-NLCs) were 287.6 nm in size with an entrapment efficiency of 71.25 %. Oral bioavailability was enhanced up to 4.2-folds with the use of Bio-CHN-NLCs vis-a-vis pure CHN. However, there was a small difference in the enhancement of bioavailability between Bio-CHN-NLCs and conventional NLCs. Although severe lipolysis happened both on Bio-CHN-NLCs and non-modified NLCs, the performance of Bio-CHN-NLCs in the bioavailability improvement was more significant. Overall, Bio-CHN-NLCs can further promote the oral absorption of CHN by a ligand-mediated active transport. It may be a promising carrier for the oral delivery of molecules similar to CHN.

### Biography:

Teenu Sharma has been pursuing her PhD at UIPS, Panjab University. She has been a meritorious student throughout her academic carrier. She has been awarded with DST INDIPIRE fellowship by Govt of India for pursuing her doctoral studies.



### Speaker Publications:

1. "Implementation of analytical quality-by-design and green analytical chemistry approaches for the development of robust and ecofriendly UHPLC analytical method for quantification of chrysin" Volume3, Issue9 September 2020 Pages 384-398
2. "Supersaturated LFCS type III self-emulsifying delivery systems of sorafenib tosylate with improved biopharmaceutical performance: QbD-enabled development and evaluation; Drug Delivery and Translational Research volume 10, pages839-861(2020)
3. Systematic Development of Drug Nanocargos Using Formulation by Design (FbD): An Updated Overview; Crit Rev Ther Drug Carrier Syst . 2020;37(3):229-269.
4. Integrated Analytical Quality by Design (AQbD) Approach for the Development and Validation of Bioanalytical Liquid Chromatography Method for Estimation of Valsartan; Journal of Chromatographic Science, Volume 58, Issue 7, August 2020, Pages 606-621
5. Phospholipid-based complex of raloxifene with enhanced biopharmaceutical potential: Synthesis, characterization and preclinical assessment; International Journal of Pharmaceutics, 17 Sep 2019, 571:118698

[19<sup>th</sup> International Conference on Pharmaceutics & Novel Drug Delivery Systems](#); Webinar; June 18-19, 2020

**Abstract Citation:**

Teenu Sharma, Target-based Pharmaceutical Formulation: Nanostructured lipid carriers for oral delivery of chrysin: Effect of surface modification on absorption, Pharmaceutica Meet 2020, 19th International Conference on Pharmaceutics & Novel Drug Delivery Systems; Webinar, June 18-19, 2020 (<https://novel-drugdelivery-systems.pharmaceuticalconferences.com/middleeast/2020>)