ISSN : 0970 - 020X, ONLINE ISSN : 2231-5039

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Oriental Journal of Chemistry

An International Research Journal of Pure & Applied Chemistry

Method Development and Validation for Estimation of Cefadroxil in Different Marketed Tablets by UV Spectrophotometry Method and Anti-Inflammatory Studies Using In-Silico Approaches

Volume 38, Number 4

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Article Publishing History

Article Received on : 14 Mar 2022
Article Accepted on :
Article Published : 06 Jul 2022

Article Review Details

Reviewed by: Dr. Nitin Rawat
Second Review by: Dr. Atul Goswami
Final Approval by: Dr. Amira Cipurkovic

Article Metrics

ABSTRACT:

Quality-based assessment of pharmaceuticals obviates the uncertainties concerning their quality, safety and efficacy for their regulatory purpose. A method was developed and validated for quality control assessment of cefadroxil for the pharmaceuticals or row material analysis. In-silico analysis wasperformedto evaluate the bioavailability, toxicity as well asanti-inflammatory potential of cefadroxil. The results showed that the developed method was found linear, accurate, precise and robust while the dissolution rate of each tablet was found comparable. In-silico docking analysis and network pharmacology analysis showed low bioavailability and toxicity as well as a significant anti-inflammatory potential of cefadroxil via regulation of genes such as TNF-α, IL-6, SLC15A1 and SLC15A2. However, due to its bioavailability barriers, further experimental strategies are necessary to re-purpose the therapeutic application of cefadroxil as a potent anti-inflammatory agent.

KEYWORDS:

Anti-Inflammatory Activity; Bioavailability; Cefadroxil; Method validation

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Ali Z, Ain S, Kumar B, Ain Q. Method Development and Validation for Estimation of Cefadroxil in Different Marketed Tablets by UV Spectrophotometry Method and Anti-Inflammatory Studies Using In-Silico Approaches. Orient J Chem 2022;38(4).

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Ali Z, Ain S, Kumar B, Ain Q. Method Development and Validation for Estimation of Cefadroxil in Different Marketed Tablets by UV Spectrophotometry Method and Anti-Inflammatory Studies Using In-Silico Approaches. Orient J Chem 2022;38(4). Available from: https://bit.ly/3yLQb04

Introduction

Cephalosporin antibiotics have been associated with a tremendous impact on the treatment of infectious diseases, clinically. Cephalosporins and the semisynthetic penicillins are closely related in the structure; all contain a β-lactam ring and a dihydrothiazide ring which includes sulphur. The isolation of the active component of cephalosporin, C-7-aminocephalosporanic acid, made possible the synthesis of different