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School of Pharmaceutical Sciences

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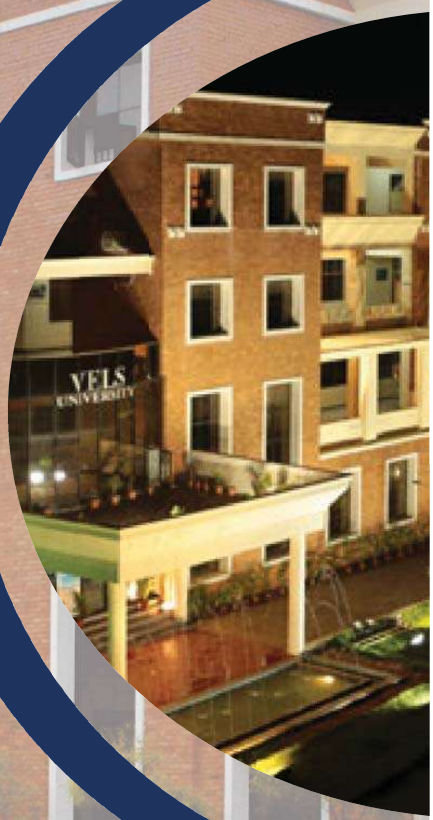
APP AnalChem Division & APP Trichy Local Branch

Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences

DATE : 27 March 2026



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INDO KOREAN INTERNATIONAL CONFERENCE ON ADVANCES IN NANOTECHNOLOGY, DRUG DEVELOPMENT AND PHARMACEUTICAL SCIENCES

March 2026

ISBN: 978-81-990189-9-0

Published by

VEDA PUBLICATIONS

G2, Kasthuri Flats.
Dhenupuri Housing Colony,
Madambakkam
Chennai - 600 126
M.No: 87544 39300
vedapub@gmail.com

Typeset & Printed by

XALENT GRAPHIXS

Chennai - 600 064
M.No: 70928 22277
xalentgraphixs@gmail.com

ISBN NO978-81-990189-9-0

APP ABSTRACT - APP 2026 - 274

DESIGN AND NOVEL SYNTHESIS OF SCHIFF BASE DERIVATIVE FOR ANTI INFLAMMATORY ACTIVITY

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Abstract:

This research focuses on the design, synthesis, and evaluation of coumarin Schiff basederivatives as potential anti-inflammatory agents with fewer side effects than traditional non-steroidal anti-inflammatory drugs (NSAIDs). NSAIDs are widely used but are associatedwith gastrointestinal and cardiovascular toxicity, creating a need for safer alternatives. In this study, four Coumarin-based compounds were designed and synthesized.Drug-likeness of the compounds was assessed using Lipinski's Rule of Five, confirming their suitability for oral use. Molecular docking studies were performed against thecyclooxygenase-2 (COX-2) enzyme to predict binding affinity and interaction patterns. All compounds showed better binding energy compared to the standard drug ibuprofen,indicating strong potential for anti-inflammatory activity. The synthesized compounds were further evaluated through an in vitro protein denaturation assay to measure anti-inflammatory effects. revealed that compounds 6 and 7 exhibited higher inhibition of protein denaturation than ibuprofen. Among them, compound 7 demonstrated the best overall performance, with the highest inhibition percentage and strong statistical correlation between concentration and activity. Although compound 8 showed excellent docking , its potential gastrointestinal side effects reduce its suitability as a lead compound. Overall, the study concludes that compound 7 is the most promising candidate for further development. Future research should focus on toxicity studies and clinical evaluation to confirm its safety and effectiveness.

Keywords: Coumarin, Schiff base derivatives, Anti-inflammatory activity, NSAIDs, Cyclooxygenase-2 (COX-2), Molecular docking, Drug design, Lipinski's Rule of Five, Protein denaturation assay, Binding affinity, Lead compound