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Redirecting the Thiazolidinedione (TZD) scaffold from antidiabetic to anticancer treatment

Introduction: The promising activity shown by compounds containing thiazolidine-2,4-dione nucleus in numerous categories such as anti-hyperglycemics, aldose reductase inhibitors, anti-cancer, anti-inflammatory, antiarthritics, anti-microbials, etc. has made it an indispensable anchor for development of newer therapeutic agents. Varied substituents on the thiazolidine-2,4-dione nucleus have provided a wide spectrum of biological activities. Abundant work has been done and reported concerning TZD's antitumor activity in a wide variety of experimental cancer models, in vitro and in vivo, by affecting the cell cycle, induction of cell differentiation and apoptosis as well as by inhibiting tumor angiogenesis. These effects are mediated through both PPAR- γ -dependent and PPAR- γ -independent pathways depending on concentration and tumor cell type.

Methods: Since a decade, in our lab we are working on TZD scaffold (Figure 1) to explore its anticancer activity. We have synthesized several TZD derivatives, by rationally modifying the general skeleton of our molecules including bio-isosteric replacement of TZD ring. In this study, we would like to summarize all the modifications of TZD derivatives and their biological evaluation, which we have undertaken till date.

Results & Discussion: Molecules from all the series showed good primary antiproliferative activity and series with TZD as pharmacophore was found to be most active in inhibiting cell growth. Some of the molecules were found to arrest cell growth in G0/G1 phase and also found to interact with various targets in cancerous cells.

Biography

C S Ramaa is a Professor and Head of Department of Pharmaceutical Chemistry at Bharati Vidyapeeth's College of Pharmacy, Navi Mumbai. She received her PhD in Pharmaceutical Chemistry from University Department of Chemical Technology. She has been working at Bharati Vidyapeeth's College of Pharmacy, Navi Mumbai. She has received several grants from renowned funding agencies like Department of Science and Technology, Basic Research in Nuclear Sciences, Lady Tata Memorial Trust and University of Mumbai. She has published more than 35 research and review articles in international and national esteemed journals. She has also presented more than 30 presentations at national and international conferences. She has been awarded as Best Research Guide for national level PharmInnova Award.

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