Contents lists available at

European Journal of Medicinal Chemistry

journal homepage: http://www.elsevier.com/locate/ejmech

Invited review

4-Thiazolidinones: The advances continue...

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ARTICLE INFO

Article history
Received 22 July 2013
Received in revised form
12 November 2013
Accepted 15 November 2013
Available online 27 November 2013

Keywords:
Thiazolidin-4-ones
Synthesis and characterization
Stereochemistry
Anticancer
Antiviral
Anticonvulsant
Cardiovascular
NSAID
Antidiabetic
Antihyperlipidemic
Antimicrobial
Antituberculosis
Antiparasitic
Patents on 4-thiazolidinones

ABSTRACT

The diversity in the biological response of 4-thiazolidinones has attracted the attention of many researchers to explore this framework for its potential. It is, therefore, of prime importance that the study of this topic and the development of new synthetic strategies should be based on the most recent knowledge, emerging from the latest research. This review is an endeavor to highlight the progress in the chemistry and biological activity of the 4-thiazolidinones, predominantly after 2006. The last section of the review encompasses the various patents granted on 4-thiazolidinone analogs/derivatives with World Intellectual Proprietary Organization (WIPO) and United State Patent Trademark Office (USPTO), particularly in the duration of the year 2000 to the year 2012.

1. Introduction

Heterocyclic compounds are an integral part of the chemical and life sciences and constitute a considerable quantum of the modern research that is being currently pursued throughout the world. Jeyaraman and Avila have reviewed the importance of heterocyclic and bicyclic compounds as intermediates in the synthesis of several physiologically active compounds [1]. These compounds are also found to be useful as intermediates for the synthesis of a variety of heterocyclic compounds [2]. 4-Thiazolidinone derivatives have attracted continuing interest over the years because of their diverse biological activities, such as anti-inflammatory, anti-proliferative, antiviral, anticonvulsant, anti-diabetic, anti-hyperlipidemic, cardiovascular, anti-tubercular, antifungal, and antibacterial. Compounds such as; ralitoline (anti-convulsant), etozoline (anti-hypertensive), pioglitazone (hypoglycemic) and thiazolidomycin (activity against streptomyces species), based on this pharmacophore are already in the market. In recent years, 4-thiazolidinone derivatives with antitumor activity on leukemia, melanoma, lung, colon, CNS, ovarian, renal, prostate and breast cancers cell lines have become a promising area of research. Different researchers have reviewed the progress on the scaffold from time to time, such as Brown in 196 [3], Newkome et al. in 1977 [4], Singh et al. in 1981 [5], Abdel-Rahman et al. in 2001 [6], Verma et al. in 2008 [7], Hamama et al. in 2008 [8] and Jain et al. in 2012 [9]. Our group has also been continuously involved in researching this nucleus through chemical modifications with encouraging results [10–12]. The review summarizes current propensity in the 4-thiazolidinone synthetic chemistry and divulges the utility of this potent

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0223-5234/$ – see front matter