1. Prabhakar, et al. (1998) reported that a new series thiazolidinedione compounds having a dual pharmacophore. The novel thiazolidinedione compounds were evaluated for their insulin sensitizer and anti-inflammatory properties in different animal models.

2. Jun, et al. (1999) synthesised dibenzocycloheptenone containing thiazolidinedione derivatives, a novel series of aldose reductase inhibitors were evaluated in vitro for their ability to inhibit rat lens aldose reductase enzyme. The design of these derivatives were based on previously published pharmacophore requirements. The most active compound in this series was a spirosuccinimide derivative.

3. Partha, et al. (2003) synthesised 2,4-thiazolidinedione derivatives of α-phenyl substituted cinnamic acid derivatives. New thiazolidinediones are evaluated for their PPAR agonist activity. Thiazolidine-2,4-dione substituted phenyl cinnamic acids with
moderate PPAR-γ agonist activity showing strong oral glucose lowering effects in animal models of Type-2 diabetes. The data suggests that the presence of the cinnamic acid double bond as well as its geometry is very important for PPAR agonism. Thus cinnamic acid based TZDs can provide lead compounds to develop new antihyperglycemic agents.

4. Dirk, et al. (2003) reported that novel thiazolidinedione derivatives as a antimicrobial agent. The cesium salt of 4-hydroxybenzaldehyde was condensed with (2R)-(−)-glycidyl-3-nitrobenzenesulfonate to give the corresponding epoxyaldehyde. The epoxyaldehyde was then condensed with the cesium salt of phenol to give the secondary alcohol. A Knoevenagel condensation with 2,4-thiazolidinedione then furnished the thiazolidinedione derivatives. The synthesized compounds were evaluated for their antimicrobial activity.

5. Raok, et al. (2003) reported the synthesis and biological activity of benzoxazole containing thiazolidinediones. Benzoxazolyl alkylamino-(alkoxybenzyl) thiazolidinediones with different alkyl substituent on the exocyclic nitrogen and observed that the lengthening of the N-alkyl substituent lowered activation of PPAR-γ. Further SAR study of the thiazolidinedione analogue with various steric and electrostatic functional groups at the exocyclic nitrogen was investigated.
6. Meral et al. (2003) synthesised a new series of 3-benzyl (p-substituted benzyl)-5-[3-(4H-4-oxo-1-benzopyran-2-yl)-benzylidene]-2,4-thiazolidinediones. These products were prepared by Knoevenagel reaction from 3-flavone carboxaldehyde and 3-substituted 2,4-thiazolidinediones. Synthesized compounds were evaluated for their in vitro insulinotropic activity.

7. Ranjit et al. (2003) identified dual PPAR α/γ agonists activity of 5-aryl thiazolidine-2,4-diones. A number of highly potent and orally bioavailable analogues were synthesized. Efficacy study results of some of these analogues in the db/db mice model of type-2 diabetes showed them superior to rosiglitazone in correcting hyperglycemia and hypertriglyceridemia.


9. Rosaria, et al. (2005) reported the synthesis of 4-thiazolidinones and 2,4-thiazolidinedione. The novel compounds were evaluated for their in vitro anti-proliferative activity. 5-(3-trifluoromethylbenzylidene)-2,4-thiazolidinedione show good antiproliferative activity.

10. Atsushi. et al. (2005) reported the synthesis of complementing ligands for mutant thyroid hormone receptor TR-β. A new thiazolidinedione like 5-(4-(4-hydroxy-3-isopropylbenzyl)-3,5-dimethylbenzylidene)thiazolidine-2,4-dione was identified as ligands for mutant thyroid hormone receptor.

11. Gurram, et al. (2006) synthesised new 2,4-thiazolidinedione derivatives of 1,3-benzoazinones. The novel thiazolidinediones evaluated for their PPAR-α and -γ dual
activation. The some of the compound showed significant improvement in lipid profile

12. Nazar, et al. (2006) synthesised a new series of 5-arylidene-2,4-dioxothiazolidine-3-aceticacid-amides by reaction between 5-arylidene-2,4-dioxothiazolidine- 3-acetic acid chloride with 1,2,4-triazole, 1,2,4-triazoline-5-one and 1,2,4-triazoline-5-thione.

13. Raok, et al. (2006) have reported the synthesis of benzothiazole derivatives of thiazolidinediones using a modified Mitsunobu reaction of 2-(benzothiazol-2-ylmethylamino) ethanol with 5-(4-hydroxybenzyl)-3-triphenylmethylthiazolidine-2,4-dione. The novel thiazolidinedione assayed for activity on peroxisome proliferator-activated receptor (PPAR) subtypes and inhibitory activity of nitrous oxide production in lipopolysaccharide activated macrophages. Most of the tested compounds were identified as potent PPAR-γ agonists, indicating their potential as drug candidates for diabetes.

14. Rosanna, et al. (2007) have reported a number of 5-arylidene-2,4-thiazolidinediones containing a hydroxyl or carboxymethoxy group in their 5-benzylidene moiety and evaluated for their in vitro aldose reductase inhibitors. Most of them exhibited strong inhibitory activity, with IC50 values in the range between 0.20 and 0.70 μM.

This series of compounds represents steps toward a metalloprotease inhibitor as a disease-modifying osteoarthritis drug.

16. Ahmed, et al. (2007) synthesised and evaluated for their analgesic and anti-inflammatory activity of 3,5-disubstituted-2,4-thiazolidinedione derivatives. The selectivity of the synthesized compounds against COX-2 enzyme was investigated studying ulcerogenic liability.

17. Arumugam, et al. (2007) developed a novel, simple and single-step preparation of thiazolidinediones from readily available 2-(hetero) aryl pyrazines as starting materials. The methodology does not require the use of expensive transition metal catalysts or organometallic reagents, and therefore has the potential to become useful alternative towards the direct synthesis of novel 2-(hetero) aryl pyrazines containing thiazolidinediones.

18. YingWu et al. (2008) synthesised benzylidene-thiazolidinedione derivatives with different substituents on the phenyl ring and their inhibitory activity was evaluated. Replacement of the cyclohexylethyl group with the hetero five-member ring increased the inhibitory potency.


20. Bharat, et al. (2009) synthesised benzylidene-2,4-thiazolidinedione derivatives. And evaluated for their PTP1B inhibitor activity. Compound 5-(3,5-bis(trifluoromethyl)benzylxylo)-5-bromobenzylidene thiazolidine-2,4-dione was showed good inhibitory activity at IC50 of 5.0 μM.


22. Changyou, et al. (2010) synthesised novel derivatives of 5-benzylidene-2,4-thiazolidinediones and evaluated for their GPR40 agonist. Among them, few
compounds demonstrated an acute mechanism-based glucose-lowering in an intraperitoneal glucose tolerance test (IPGTT) in lean mice, while no effects were observed in GPR40 knockout mice.

23. Vijay et al.,(2010) have reported the synthesis of ten novel derivatives of 5-benzylidene-2,4-thiazolidinediones and their structures were determined by analytical and spectral methods. Synthesized compounds were evaluated for their antiproliferative activity.

24. Amal et al.,(2010) synthesised pyrazolyl-2,4-thiazolidinedione derivatives and evaluated for their anti-inflammatory and anti-neurotoxic activity. Compound 5-(3-(4-chlorophenyl)-1-H-pyrazol-4-yl) methylene thiazolidine-2,4-dione showed anti-neurotoxic activity at concentrations below their cytotoxic range.

25. Robert et al. (2010) have reported the novel regiospecific 5-benzylidene-2,4-thiazolidinediones and 5-benzylidene-4-oxo-2-thiazolidinethiones to the corresponding 5-benzyl derivatives has been accomplished using lithium borohydride in pyridine and tetrahydrofuran. Sodium borohydride and lithium chloride can also be used under these conditions, which represents a cheaper alternative to lithium borohydride.

26. Rosanna, et al. (2011) have reported synthesis of a series of 4-(5-Arylidene-2,4-dioxothiazolidin-3-yl)methyl benzoic acids derivatives. The new thiazolidinedione were evaluated for their in vitro protein tyrosine phosphates inhibitor (PTP). Several 4-(5- Arylidene-2,4-dioxothiazolidin-3-yl)methyl benzoic acids exhibited PTP1B inhibitory activity in the low micromolar range with moderate selectivity.
27. Swastika Ganguly, et al. (2012) were performed molecular docking studies on novel thiazolidinediones by Glide, Flex, and Scigress Explorer Ultra programs and the X-ray crystallographic structure of HIV-1 Reverse transcriptase (PDB code 1RT2) to study the binding mode of these analogs. The experimental conformation of the bound ligand TNK 651 was precisely reproduced by the docking procedures as demonstrated by low (3.00 Å) root mean square deviations. Results of this study indicated that most of the compounds dock into the active site of 1RT2 enzyme with good docking scores comparable to the bound compound TNK 651. The docking analysis of the highest active molecule shows significant interaction with active site amino acid residues and H-bond interactions with the key amino acid residues.

28. Anna Pratima G Nikalje, et al. (2012) reported that a series of novel 2,4-thiazolidinedione derivatives 2-{4-[(E)-(2,4-dioxo-1,3-thiazolidin-5-ylidene)methyl]phenoxy}-N-(substituted phenyl) acetamides have been accomplished in good yields by stirring 2,4-thiazolidinedione a and 2-(4-formyl phenoxy) N-substituted acetamide at room temperature. Some of the reaction sequences were carried under microwave irradiation which resulted in increased reaction rate and yield enhancement. The synthesized compounds were evaluated for their hypoglycemic activity in Wister albino mice animal model and histopathological studies for kidney and Liver were performed. Some of the derivatives have exhibited promising hypoglycemic activity.

29. Shital L, et al, (2012) reported that a series of novel thiazolidinediones were prepared by incorporating pharmacologically significant moieties viz. ester, hydrazide and substituted amine groups linked to the central phenyl ring as well as replacement of phenyl by heterocyclic like substituted furan ring by employing multistep synthetic protocols. The structures of the newly synthesized target molecules were established by spectral data. The synthesized compounds were tested for their in vitro antibacterial activity against the Gram-positive viz. Bacillus subtilis, Staphylococcus aureus and Gram negative viz. Pseudomonas aeruginosa bacteria.

30. Naresh babu chilamakuru, et al. (2013) synthesised a series of 3,5-disubstituted thiazolidine-2,4-dione derivatives by condensation of thiazolidine-2,4-dione with aromatic aldehydes at 5th position-Knoevenagel reaction followed by condensation of these 5-substituted thiazolidine-2,4-diones by using various aromatic and alkali halides at 3rd position yielding to 3,5-disubstituted thiazolidine-2,4-diones. The synthesized compounds were predicted for biological activities by using Prediction of
Activity Spectra for Substances computerized program-(Insilico method) based on those results the compounds were screened against Mycobacterium tuberculosis by using Streptomycin and Pyrazinamide as standard drugs.

31. Faiyazalam M Shaikh, et al. (2013) prepared 1,3-thiazolidine-2,4-dione (TZD) derivatives have been by Knoevenagel condensation reaction between TZD and aromatic aldehydes followed by condensation with 3,4-dichloro benzoyl chloride. All the synthesized compounds were tested for antibacterial activity against Gram-positive cocci and Gram-negative rods, antifungal activity and antitubercular activity.

32. Gurudeeban Selvaraj, et al. (2014) isolated and evaluated PPAR-γ agonist property of phytocompounds from Rhizophora apiculata using in silico approach. The 30 g powdered leaves of R. apiculata extracted through acid-base method and subjected to GC-MS analysis. GC-MS results identified 18 phytocompounds, among those major peaks were 1-adamantyl-p-methylbenzalimine, clivorin, 4-butyl pyridine, 1-oxide, acetamide and p-aminodiethylaniline. In silico analysis of major compounds on human PPAR-γ protein was determined by AutoDock 4.0. Compared to thiazolidinediones, R. apiculata derived ligands acts as a potential agonist with binding energy.

33. Kekare Prajact G, et al. (2014) prepared new substituted 1, 3, 4-thiadiazole derivatives were synthesized using Microwave assisted organic synthesis irradiation technique. The structures of these compounds were established by means of FTIR, 1H-NMR and elemental analysis. All the compounds were evaluated for antibacterial, antifungal and anticancer activities.

34. Metta Madhuri, et al. (2014) reported that molecular docking study was performed on a series of 24 Thiazolidinediones as potential epiderma growth factor receptor (EGFRR) inhibitors. The docking technique was applied to dock a set of representative compounds within the active site region of 1M17 using Molegro Virtual Docker v 5.0. The docking simulation clearly predicted the binding mode that is nearly similar to the crystallographic binding mode with 1.34Ao RMSD. Based on the validations and hydrogen bond interactions made by substituents were considered for evaluation. The results avail to understand the type of interactions that occur between thiazolidinediones with 1M17 binding site region and explain the importance of substitutions on thiazolidinedione basic nucleus.

35. Aaron Mathew Thomas, et al. (2014) studied the docking of substituted 2,4-Thiazolidinediones against HMG CoA reductase for antihyperchoesterolemic activity.
2. 4-Thiazolidinediones were prepared from chloroacetic acid and thiourea in presence of concentrated hydrochloric acid. Further they are treated with aromatic amines, formaldehyde and ethanol leads to the formation of mannieb bases. All the theoretically synthesized compounds were docked against HMG CoA reductase by using Argus Lab Software.

36. K. Sudheer kumar, et al. (2014) reported that different substituted pyrazole carbaldehydes which were synthesized by Vilsmeier-Haack reaction of substituted phenyl hydrazones with POCl₃ and dimethyl formamide, hybridized with 2,4-thiazolidinedione in the presence of acetic acid and catalytic amounts piperidine. The synthesized hybrids were evaluated against three different cancer cell lines.

37. Shriram S. Purohit, et al. (2014) synthesised benzisoxazole containing thiazolidinediones were designed, docked with PPAR-γ protein leading to identification of a highly potent PPAR-γ agonist. Based on molecular docking studies and lipinski’s rule of five, nine analogues out of 12 were synthesized and characterized by FT-IR, 1H-NMR and Mass spectra. Anti-diabetic activity of nine analogues was evaluated in alloxan (70 mg/kg, i.v.)-induced diabetes in mice. The molecular docking and the pharmacological studies revealed that the distances between the acidic group and the linker, when a ligand was complexed with PPAR-γ protein, are important for the potent activity.

38. Santosh L. Gaonkar, et al. (2015) reported that a series of N-substituted thiazolidine-2, 4-dione derivatives bearing potentially bioactive substituents were synthesized by microwave irradiation method. Structural elucidation was accomplished by ¹H NMR, ¹³C NMR, IR, Mass and elemental analyses. The synthesized compounds were evaluated for antimicrobial activities.

39. Ahmed A. Elhenawy, et al. (2015) synthesised some thiazolidinedione derivatives. The structures of these compounds established on the basis of IR, ¹HNMR, ¹³CNMR and MS data. Moreover, the optimization geometries for compounds were discussed using DFT theory with B3LYP/6-311G base set. The molecular docking simulations into the active site of PPARγ were performed, and showed that, the compound more suitable inhibitor against PPARγ, and can used as antidiabetic drug.

40. Ayyakannu Arumugam Napoleon, et al. (2016) have been synthesized a variety of molecules based on thiazolidinedione and evaluated with improved pharmacological activities. Due to wide range of pharmacological activities and
clinically used 2, 4-thiazolidinediones, these molecules have attracted much attention and encouraged the chemists and biologists to be extensive investigations or molecular manipulations.

41. Olusola Olalekan Elekofehinti, et al. (2016) carried out the molecular docking studies with thiazolidinediones and rutin into the binding cavity of PPARγ showed that rutin have more favourable interaction than PPARγ with better docking score. The results of this study can be useful for the design and development of novel compounds having better PPARγ agonist activity which can consequently be used to cure/manage type 2 diabetes mellitus.