Lokmanya Tilak Jankalyan Shikshan Sanstha's
PRIYADARSHINI BHAGWATI COLLEGE OF ENGINEERING
Harpur Nagar, Umred Road (Near Bada Tajbagh), Nagpur-24
(Approved by AICTE, New Delhi, Govt. of Maharashtra
and affiliated to Rashtrasant Tukdoji Maharaj Nagpur University)
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This is certified that Number of research papers published per teacher in the Journals notified on UGC care list during the last five years.

Year	2022	2021	2020	2019	2018
Number of Research papers	18	9	12	11	2
Total					52

Certified Document from page No. 01 to 04

NITIN KRISHNARAO CHOUDHARI

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3.3.1 Number of research papers published per teacher in the Journals notified on UGC care list during the last five years.

For the Year 2018				
Sr. No	**Title of paper**	**Name of the author/s**	**Name of journal**	**Is it listed in UGC Care list**
1	Exploring the antiinflammatory potentials of N ((5(((1,3dioxoisoindolin2yl) methyl) amino)1,3,4 thiadiazol2yl)methyl) benzamid	Dr. A. C. Haldar	Drug discovery	UGC Care
2	Uracil Substitution on a Hippuric Acid Containing 1,3,4thiadiazole Scaffold: The Exploration of the AntiHyperglycaemic Potential	Dr. A.C. Haldar	International Journal of Medical Science in Clinical Research and Review	UGC Care

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REPORT

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DRUG DISCOVERY

Exploring the anti-inflammatory potentials of *N*-((5-(((1,3-dioxoisoindolin-2-yl)methyl)amino)-1,3,4-thiadiazol-2-yl)methyl)benzamide

Debarshi Kar Mahapatra[1☼], Kanhaiya M Dadure[2], Animeshchandra GM Haldar[3]

In the process of drug discovery, several non-steroidal anti-inflammatory drugs (NSAIDs) have been developed, however, a majority of them suffered from pharmacodynamics, pharmacokinetic, side-effects, or adverse drug reactions, which compelled researchers for continuous searching for better alternatives. The present research involved rational synthesis of *N*-((5-(((1,3-dioxoisoindolin-2-yl)methyl)amino)-1,3,4-thiadiazol-2-yl)methyl)benzamide from the starting material *N*-((5-amino-1,3,4-thiadiazol-2-yl)methyl)benzamide (which in turn was formed by the reaction of hippuric acid with thiosemicarbazide in the presence of H_2SO_4) with phthalimide in the presence of formaldehyde, followed by exploration of *in vivo* anti-inflammatory potential by utilizing the carrageenan-induced paw edema method. The compound presented noteworthy activity as compared to that of standard drug indomethacin, probably by inhibiting the inflammatory mediators like COX-1/2 and LOX. The research will definitely open new avenues to the medicinal chemists for further development of anti-inflammatory drugs with pronounced activity along with a better safety profile.

INTRODUCTION

Inflammation is the most imperative process of the human body which acts as the first-line of defense against harmful pathogens (Mahapatra *et al*., 2018). It is often characterized by redness, warmth, swelling, and pain and sometimes immobility (Amdare *et al*., 2017). At the same time, the process of inflammation can also be problematic, though; it is known to play an imperative role in the pathogenesis of some chronic diseases (Mahapatra *et al*., 2018a). In the process of drug discovery, several non-steroidal anti-inflammatory drugs (NSAIDs) have been developed, however, the majority of them suffered from either pharmacodynamics, pharmacokinetic, side-effects, or adverse drug reactions (Mahapatra *et al*., 2018b), which compelled researchers for the continuous search for better alternatives (Mahapatra *et al*., 2017).

Thiadiazole is one of the privileged heterocycles in medicinal chemistry having multifarious pharmacological potentials such as anti-bacterial, anti-fungal, anti-cancer, anti-ulcer, anti-convulsant, anti-inflammatory, anti-tubercular, anti-viral, anti-leishmanial, anti-trypanosomal, anti-oxidant, etc (Hu *et al*., 2014). Recently, a number of hybrid scaffolds of 1,3,4-thiadiazole have been reported like 2-amino-5-(3,4-dimethoxyphenyl)-1,3,4-thiadiazole (Labanauskas *et al*., 2001), 5-(1-adamantyl)-1,3,4-thiadiazole (Kadi *et al*., 2010), 1,2,4-triazolo[3,4-b][1,3,4]thiadiazoles (Karegoudar *et al*., 2008), methylene bridged benzofuranyl imidazo[2,1-b][1,3,4]thiadiazoles (Jadhav *et al*., 2008),1,2,4-triazolo-[3,4-b]-1,3,4-thiadiazole (Gilani *et al*., 2010), 5-(3,5-di-tert-butyl-4-hydroxyphenyl)-1,3,4-thiadiazoles (Mullican *et al*., 1993), 3-(2,4-dichlorophenoxy)methyl)-1,2,4-triazolo-thiadiazole (Shehry *et al*., 2010), spiro-xanthene-9′,2-[1,3,4]thiadiazole (Hafez *et al*., 2008), 2-Amino-5-sulfanyl-1,3,4-thiadiazole (Sainy *et al*., 2008), 2-trifluoromethyl/sulfonamido-5,6-diaryl substituted imidazo[2,1-b]-1,3,4-thiadiazole (Gadad *et al*., 2008), etc.

Phthalimide also finds importance in inflammation conditions as a potent inhibitor of inflammatory mediators. In the journey of drug discovery, alkyl-substituted phthalimide 1*H*-1, 2, 3-triazole derivatives (Assis *et al*., 2012), oxadiazolo-phthalimides (Antunes *et al*., 2003), mandelic acid derived phthalimides (Varala *et al*., 2008), arylphthalimides (Assis *et al*., 2014), etc. have been found to be potent anti-inflammatory candidates.

The present research involved rational synthesis of *N*-((5-(((1,3-dioxoisoindolin-2-yl)methyl)amino)-1,3,4-thiadiazol-2-yl)methyl)benzamide from the starting material *N*-((5-amino-1,3,4-thiadiazol-2-yl)methyl)benzamide (which in turn was formed by the reaction of hippuric acid with thiosemicarbazide in the presence of H_2SO_4) with phthalimide in the presence of formaldehyde, followed by exploration of *in vivo* anti-inflammatory potential by utilizing the carrageenan-induced paw edema method.

MATERIALS AND METHODS

Chemicals and instrumentation

The starting material *N*-((5-amino-1,3,4-thiadiazol-2-yl)methyl)benzamide was obtained from our previous report. The

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Uracil Substitution on a Hippuric Acid Containing 1,3,4-thiadiazole Scaffold: The Exploration of the Anti-Hyperglycaemic Potential

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Abstract:

The human civilization has witnessed diabetes mellitus as a curse which has already affected 400 million individuals and is expected to affect 600 million people by the end of 2030. Compromised pharmacokinetics, reduced pharmacological efficacy, etc. of the modern-day drugs has motivated researchers across the world to look for better alternatives. 1,3,4-thiadiazoles have been rising as a prominent scaffold in reducing the blood glucose level through various mechanisms. While moving towards the glorified path of drug design, a novel molecule with anti-diabetic interest was developed with an intention of having a better pharmacological profile than the existing drugs by substituting a uracil moiety at 5th position of a hippuric acid containing 1,3,4-thiadiazole scaffold and screened using streptozotocin-induced hyperglycemic method in Swiss albino rats. The uracil-containing 1,3,4-thiadiazole expressed an impressive hypoglycemic activity with a 28.89% reduction in the blood glucose level at 6 hrs. The compound also exhibited comparable pharmacological activity with that of the standard drug glibenclamide (39.12%) at 6 hrs. The compound may be believed to successfully reduce the glucose level by either an expression of PPAR-γ or inhibition of α-glucosidase. The research has opened new prospects in the rational designing of the next generation anti-hyperglycemic drug molecules with pronounced pharmacodynamics and pharmacokinetic effects.

Keywords: Antidiabetic, Antihyperglycemic, Hypoglycemic, Hippuric acid, Thiadiazole, Uracil.

Introduction

The human civilization has witnessed diabetes mellitus as a curse which has already affected 400 million individuals and is expected to affect 600 million people by the end of 2030 [1]. Although, five classes of therapeutic agents; dipeptidyl peptidase-4 (DPP-4) inhibitors, protein tyrosine phosphatase 1B (PTP1B) inhibitors, α-glucosidase inhibitors, aldose reductase (ALR) inhibitors, and peroxisome proliferator activated receptor-γ (PPAR-γ) activators [2] have been into applications for treating hyperglycemia, but several complications, like compromised pharmacokinetics, reduced pharmacological efficacy, etc. has motivated researchers across the world to look for better alternatives [3]. Drug discovery is a continuous process which aims at developing the best inhibitors having intense pharmacodynamics and pharmacokinetics attributes [4]. Thiadiazole is a vital