Ten best Publications (From 2017-2021)

1. Sahoo, C.R**., Paidesetty, S.K.**, Padhy, R.N. "The recent development of thymol derivative as a promising pharmacological scaffold" ***Drug Development Research***, **2021**, Article in Press 10.1002/ddr.21848 **Impact factor 4.360**

Thymol is a privileged scaffold that has been diversified in natural sources. This scaffold acts as an obligatory template for scheming and arriving at designing newer drug-molecules with potential biological activities. Owing to the pharmacological perspective, the promising active sites of the scaffold are the positions C-1, C-4, and C-6 of thymol would be accountable for developing potent drug candidates. This review aims to explore the various synthetic routes and the structural-activity relationship of thymol scaffold with accountable active pharmacophore sites.

2.AK Bishoyi, M. Mahapatra, **SK Paidesetty**, RN Padhy "Design, molecular docking, and antimicrobial assessment of newly synthesized phytochemical thymol Mannich base derivatives" ***Journal of Molecular Structure***, **2021**, 1244, 130908 doi.org/10.1016/j.molstruc.2021.130908 **Impactor factor 3.19**

Antibacterial resistance has been brewing for decades and has now surfaced into potential public health emergency, everywhere. Thus, newer potent drug candidates are needed urgently that would help overcoming antibiotic resistances in bacteria and fungi. In this research study, designed and synthesized a series of thymol mannich base containing sulfonamide, confirmed their structures by empolying different spectral studies then sceened antimicrobial assesment against uropathogenic bacterial strains and dermatophytic fungal strains. Obtained results indicated that compound 2-isopropyl-5-methyl-4-(pyrrolidin-1-ylmethyl)phenol, 4f had exhibited significant inhibition of E.coli with MIC 3.12µg/mL ;whereas the compound 4-((dimethylamino)methyl)-2-isopropyl-5-methylphenol, 4g had a good inhibition T. rubrum at 3.12 µg/mL. Overall, the congeners carrying the bioactive phytochemical phenolic system, sulfonyl radical, and the amino-methylated group that could be responsible for enhancing the antimicrobial action and also be a lead candidate to overcome the antibiotic resistance action.

3.Swain, S.S., **Paidesetty, S.K.**, Dehury, B., ...Vedithi, S.C., Padhy, R.N. "Computer-aided synthesis of dapsone-phytochemical conjugates against dapsone-resistant Mycobacterium

leprae" ***Scientific Reports***, **2020**, 10(1), 6839 10.1038/s41598-020-63913-9. **Impact factor 4.12**

Leprosy continues to be the grievous public health hazard for high disability and morbidity cases with stable prevalence rates today, even treatment with dapsone (DDS) in the multidrug therapy (MDT). Owing to resistant to DDS, the disease spreads like wildfire in several countries. In this research study, Dapsone (DDS) was chemically hybridized with several monophenolic phytochemicals of which, 'dapsone-thymol hybrid' molecule had shown effective, after the comprehensive bioinformatics analysis before synthesis. Thereafter, shortlisted hybrids candidates were synthesized and sucessfully intrepreated; then screened antileprosy activity by mouse-foot-pad propagation method, followed by host-toxicity testing in cultured-human-lymphocytes. Obtained results, the dapsone-thymol congener was the sought-after antileprosy drug.

4. Sahoo, C.R., **Paidesetty, S.K.**, Dehury, B., Padhy, R.N. "Molecular dynamics and computational study of Mannich-based coumarin derivatives: potent tyrosine kinase inhibitor" ***Journal of Biomolecular Structure and Dynamics***, **2020**, 38(18), 5419–5428 10.1080/07391102.2019.1701554 **Impact factor 3.56**

The manifestation of bacterial UTI (Urinary Tract Infection) has been predominantly endemic, globally;eventually, the development of new UTI antibacterial agent(s) remains the call of the day. Herein, developed two series of 4-hydroxy coumarin Mannich-based derivatives, 7a-m and 8a-m were designed. and interpreted spectral analyses and performed their in vitro antibacterial studies. The compound, 4-hydroxy-3-((4-hydroxy-3-methoxyphenyl)(morpholino)methyl)-2H-chromen-2-one 8l had shown significant against pathogenic bacteria S. aureus and E. Coli.. Computational tools were investigated and desired drug candidate subjected to carry out their molecular simulations with 100ns.The results from the present structure-based designing approach might be a valuable tool towards identification of a new antibacterial drug candidate(s) against UTI in near future.

5. Sahoo, J., Sahoo, C.R., Nandini Sarangi, P.K., ...Padhy, R.N., **Paidesetty, S.K**. "Molecules with versatile biological activities bearing antipyrinyl nucleus as pharmacophore" ***European Journal of Medicinal Chemistry***, **2020**, 186, 111911. 10.1016/j.ejmech.2019.111911 **Impact factor 6.56**

A review included exploring steps of synthetic antipyrinyl analogues and biological actions described so for, during last three decades; thus, this article gives up-to-date images on antipyrinyl analogues. The article focused on several *in vivo* and *in vitro* pharmacological screening models, for various biological activities exhibited by the newly synthesized molecules bearing antipyrine nucleus. Most of the new antipyrine derived molecules are able to exhibit potential antimicrobial activity along with other pharmacological activities. The control of multidrug resistant microbial pathogens creating havocs as emerging staggering infectious diseases require novel, rather emulating antimicrobials for microbial infections, such as TB. Thus this work is an addition to antimicrobial drug-research

6. Sahoo, C.R., **Paidesetty, S.K.**, Padhy, R.N. "Norharmane as a potential chemical entity for development of anticancer drugs" ***European Journal of Medicinal Chemistry***, 2019, 162, 752–76410.1016/j.ejmech.2018.11.024 **Impact factor 6.56**

Cancer is a leading cause of death generally, and to overcome this problem the introduction of a new drug developing is a continuous endeavour. An alkaloid, norharmane and its derivatives, which have anticancer activities, widely distributed in several living and synthetic chemical sources. Herewith, the suggested mechanisms of organic reactions and synthetic approaches of norharmane available so far were considered. Active sites of norharmane nucleus positions, C-1, C-3, and N-9, were used for developing new molecules and based on structure activity relationship (SAR), those have been seen with anticancer activities. This summarizes on chemistry of synthetic strategies of norharmane derivatives, which may provide a framework to design a novel anticancer drug, in future.

7. Swain, S.S., **Paidesetty, S.K**., Dehury, B., ...Hussain, T., Padhy, R.N. "Molecular docking and simulation study for synthesis of alternative dapsone derivative as a newer antileprosy drug in multidrug therapy" ***Journal of Cellular Biochemistry***, 2018, 119(12), 9838–9852 10.1002/jcb.27304 **Impact factor 4.429**

Leprosy (causative, Mycobacterium leprae) continues to be the persisting public health problem with stable incidence rates, owing to the emergence of dapsone resistance that being the principal drug in the ongoing multidrug therapy.Hence, to overcome the drug resistance, structural modification through medicinal chemistry was used to design newer dapsone derivative(s) (DDs), against folic acid biosynthesis pathway. The approach included

theoretical modeling, molecular docking, and molecular dynamic (MD) simulation as well as binding free energy estimation for validation of newly designed seven DDs,before synthesis. Theoretical modeling, docking, and MD simulation studies were used to understand the mode of binding and efficacy of DDs against the wild-type and mutant dihydropteroate synthases (DHPS). Finally, DD3 was synthesized and characterized using spectral studies. This study suggested that DD3 could be further promoted as newer antileprosy agent. The principles of medicinal chemistry and bioinformatics tools help to locate effective therapeutics to minimize resources and time in current drug development modules.

8. Swain, S.S., **Paidesetty, S.K.**, Padhy, R.N. "Antibacterial, antifungal and antimycobacterial compounds from cyanobacteria "***Biomedicine and Pharmacotherapy***, 2017, 90, 760–776 10.1016/j.biopha.2017.04.030 **Impact factor 6.529**

Infections from multidrug resistant (MDR) pathogenic bacteria, fungi and Mycobacterium tuberculosis remain progressively intractable. The search of effective antimicrobials from other possible nonconventional sources against MDR pathogenic bacteria, fungi and mycobacteria is call of the day. This review considers 121 cyanobacterial compounds or cyano-compounds with antimicrobial activities. Cyanobacteria appear to be a diverse source of compounds with antimicrobial activity. Further attenion is required to elucidate whether those could be applied as pharmaceuticals.

9. Swain, S.S., **Paidesetty, S.K.**, Padhy, R.N." Antibacterial activity, computational analysis, and host toxicity study of thymol-sulfonamide conjugates" ***Biomedicine and Pharmacotherapy***, 2017, 88, 181–19310.1016/j.biopha.2017.01.036 **Impact factor 6.529**

Methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin resistant Enterococcus faecalis (VRE) are notorious pathogenic multidrug resistant (MDR) bacteria in both hospital and community sectors, and today the first antibacterial drug sulfamethoxazole is ineffective. The monoterpene phytochemical phenol, thymol was conjugated with seven sulfa drug derivatives individually, adopting the dye-azo synthesis protocol and characterised their structure. Conjugates were assessed for antibacterial activity in vitro and in silico**;** MIC and MBC values of each conjugate were determined against isolated MRSA and VRE strains from clinical samples**.** The conjugate, 4b (thymol + sulfadiazine) against MRSA and VRE strains on agar plates were 20

and 40 mg/mL as the lowest MIC and MBC values, respectively; while the reference antibiotic ampicillin had the lowest MIC and MBC values at 80 to 180 mg/mL. In vitro host-toxicity testing was carried out with cultured human-lymphocytes from umbilical cord blood, and 4b was broadly non-toxic to human cells at 15,000 mg/L. Thus, 4b could be promoted a newer antibacterial, against gruesome MDR bacteria.

10. Swain, S.S., **Paidesetty, S.K.**, Padhy, R.N." Development of antibacterial conjugates using sulfamethoxazole with monocyclic terpenes: A systematic medicinal chemistry based computational approach" ***Computer Methods and Programs in Biomedicine***, 2017, 140, 185–194 10.1016/j.cmpb.2016.12.013 **Impact factor 5.428**

To develop 6 conjugate agents of the moribund antibiotic sulfamethoxazole (SMZ) joined to 6 individual monoterpenes, followed by protocols of medicinal chemistry as potent antibacterials, against multidrug resistant (MDR) human gruesome pathogenic bacteria.Antibacterial activities of individual chemicals and conjugates were examined by targeting the bacterial folic acid biosynthesis enzyme, dihydropteroate synthases (DHPSs) of bacteria, *Bacillus anthracis*, *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus pneumoniae* and *Mycobacterium tuberculosis* with 3D structures of DHPSs from protein data bank. Conjugate-2 & 5 were more effective than individual monoterpenes and SMZ, against pathogenic bacteria. Synthesis, characterization *and in vitro* antibacterial study with acute toxicity testing for Wister rat model of the conjugate-5 could land at success

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