Excellence in Research work of which claimed for SUN Pharma Research Award

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 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. Cited (Swain, S.S., **Paidesetty, S.K.**, Dehury, B., ...Vedithi, S.C., et. al.. "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)**

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

Cited (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, 181–193[10.1016/j.biopha.2017.01.036](https://doi.org/10.1016/j.biopha.2017.01.036) **Impact factor 6.529)**

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. Cited (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**)

An exploring steps of synthetic antipyrinyl analogues and biological actions described so for, during last three decades; 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 the work is an addition to antimicrobial drug development.Cited (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)**