Publications Template

#	Research Title	Field	Abstract	Year of Publication Publishing	Publishing Link "URL"
1	Novel thiosemicarbazides induced apoptosis in human MCF-7 breast cancer cells via JNK signaling.	Synthetic chemistry and drug design	In this study, novel thiosemicarbazides and 1,3,4-oxadiazoles were synthesized and evaluated for their anticancer effects on human MCF-7 breast cancer cell lines. Among the synthesized derivatives studied, compound 2-(3-(4-chlorophenyl)-3-hydroxybutanoyl)-N-phenylhydrazinecarbothioamide 4c showed the highest cytotoxicity against MCF-7 breast cancer cells as it reduced cell viability to approximately 15% compared to approximately 25% in normal breast epithelial cells. Therefore, we focused on 4c for further investigations. Our data showed that 4c induced apoptosis in MCF-7 cells which was further confirmed by TUNEL assay. Western blotting analysis showed that compound 4c up-regulated the pro-survival proteins Bax, Bad and ERK1/2, while it down-regulated anti-apoptotic proteins Bcl-2, Akt and STAT-3. Additionally, 4c induced phosphorylation of SAPK/JNK in MCF-7 cells. Pretreatment of MCF-7 cells with 10 μM of JNK inhibitor significantly reduced 4c-induced apoptosis. Molecular docking results suggested that compound 4c showed a binding pattern close to the pattern observed in the structure of the lead fragment	2015	https://pubmed.ncbi.nlm.nih.gov/25363687/

			bound to JNK1. Collectively, the data of current study suggested that the thiosemicarbazide 4c might trigger apoptosis in human MCF-7 cells by targeting JNK signaling.		
2	Synthesis of some new amide-linked bipyrazoles and their evaluation as anti-inflammatory and analgesic agents	Synthetic chemistry and drug design	Four series of new bipyrazoles comprising the N-phenylpyrazole scaffold linked to polysubstituted pyrazoles or to antipyrine moiety through different amide linkages were synthesized. The synthesized compounds were evaluated for their anti-inflammatory and analgesic activities. In vitro COX-1/COX-2 inhibition study revealed that compound 16b possessed the lowest IC50 value against both COX-1 and COX-2. Moreover, the effect of the most promising compounds on inducible nitric oxide synthase (iNOS) and cyclooxygenase (COX-2) protein expression in lipopolysaccharide (LPS)-activated rat monocytes was also investigated. The results revealed that some of the synthesized compounds showed anti-inflammatory and/or analgesic activity with less ulcerogenic potential than the reference drug diclofenac sodium and are well tolerated by experimental animals. Moreover, they significantly inhibited iNOS and COX-2 protein expression induced by LPS stimulation. Compounds 16b and 18 were proved to display anti-inflammatory activity superior to diclofenac sodium and analgesic activity equivalent to it with minimal ulcerogenic potential.	2016	https://pubmed.ncbi.nlm.nih.gov/26482802/
3	Novel 1,5-diphenyl-6-substituted 1H-pyrazolo[3,4-	Synthetic chemistry and drug design	Novel 1,5-diphenyl-6-substituted-1H-pyrazolo[3,4-d]pyrimidin-4(5H)-ones were synthesized and characterized. All compounds were screened for	2016	https://pubmed.ncbi.nlm.nih.gov/26677729/

	d]pyrimidin-4(5H)-ones induced apoptosis in RKO colon cancer cells		their anti-proliferative activities in five different cancer cell lines. The results showed that compounds 7a and 7b comprising aminoguanidino or guanidino moiety at position 6 inhibited proliferation of RKO colon cancer cells with IC50 of 8 and 4 µM, respectively. Compounds 7a and 7b induced apoptosis in RKO cells, which was confirmed by TUNEL and annexin V-FITC assays. Flow cytometric analysis indicated that compounds 7a and 7b arrested RKO cells in the G1 phase and the most active compound 7b increased levels of p53, p21, Bax, ERK1/2 and reduced levels of Bcl2 and Akt. Compound 7b also activates release of cytochrome c, which is consistent with activation of caspase-9. Additionally, compound 7b increased caspase-3 activity and cleaved PARP-1 in RKO cells. Collectively, these findings could establish a molecular basis for the development of new anti-cancer agents.		
4	Novel quinuclidinone derivatives induced apoptosis in human breast cancer via targeting p53	Synthetic chemistry and drug design	Small molecules that can target human cancers have been highly sought to increase the anticancer efficacy, the present work describes the design and synthesis of novel series of five quinuclidinone derivatives **(2a-2e)**. Their anticancer activities were investigated against breast cancer cells MCF-7, MDA-MB-231 breast cancer cells harboring mutant p53 and normal breast counterpart MCF-12a. Derivative **2e** reduced proliferation of MCF-7 and MCF-12a while it has no effect on MDA-MB-231. Derivative **2e** induced apoptosis in MCF-7 cells which is further confirmed by TUNEL assay and it reduced the	2017	https://www.sciencedirect.com/science/article/abs/pii/S0045206816304151

			percentage of cell in G2/M phase as confirmed by increased expression of cyclin B and reduced expression of cyclin D1. Derivative **2e** reduced expression levels of Mdm2, Akt and ERK1/2 by and increased expression level of p53. Moreover, the apoptosis induction by **2e** was also inhibited by PFT-α as evidenced by non-significant induction of apoptosis after treatment of MCF-7 cells with both derivative **2e** and PFT-α. In addition, docking study reveals that derivative **2e** has a binding pattern close to the pattern observed in the structure of the lead fragment 5,6-dimethoxy-2-methylbenzothiazole bound to T-p53C-Y220C. The above findings demonstrate that derivative **2e** induces apoptosis in MCF-7 cells via targeting p53 which merits further development.		
5	Design, synthesis, antibacterial evaluation and molecular docking studies of some new quinoxaline derivatives targeting dihyropteroate synthase enzyme	Synthetic chemistry and drug design	Development of new antimicrobial agents is a good solution to overcome drug-resistance problems. From this perspective, new quinoxaline derivatives bearing various bioactive heterocyclic moieties (thiadiazoles, oxadiazoles, pyrazoles and thiazoles) were designed and synthesized. The newly synthesized compounds were evaluated for their *in vitro* antibacterial activity against nine bacterial human pathogenic strains using the disc diffusion assay. In general, most of the synthesized compounds exhibited good antibacterial activities. The thiazolyl 11c displayed significant antibacterial activities	2018	https://www.sciencedirect.com/science/article/abs/pii/S0045206817307423

			against *P. aeruginosa* (MIC, 12.5 µg/mL vs levofloxacin 12.5 µg/mL). Molecular docking studies indicated that the synthesized compounds could occupy both *p*-amino benzoic acid (PABA) and pterin binding pockets of the dihydropteroate synthase (DHPS), suggesting that the target compounds could act by the inhibition of bacterial DHPS enzyme. The results provide important information for the future design of more potent antibacterial agents.		
6	Potential Anticancer Agents: Design, Synthesis of New Pyrido[1,2-a] benzimidazoles and Related Derivatives Linked to Alkylating Fragments	Synthetic chemistry and drug design	The incentive of the present work has been primarily directed towards the design and synthesis of some novel pyrido[1,2-a]benzimidazoles with specific functionalities believed to have alkylation ability. This combination of pharmacological agents may enable synergistic anticancer effect. Nine compounds **5b, 13a, 13d, 13e, 14b, 14c, 15, 16,** and **17** were selected by the National Cancer Institute (NCI), Bethseda, Maryland, USA to be evaluated for their *in vitro* antitumor activity. All the selected compounds were tested initially at a single dose (10 µM) in the full NCI 60 cell panel including leukemia, non-small cell lung, colon, CNS, melanoma, ovarian, renal, prostate and breast cancer cell lines. Majority of the test compounds exhibited moderate cytotoxic activity. The highest activity in all the investigated cancer cells was displayed by **14c** against melanoma	2018	https://www.hilarispublisher.com/abstract/potential-anticancer-agents-design-synthesis-of-new-pyrido12abenzimidazoles-and-related-derivatives-linked-to-alkylating-32746.html

			SK-MEL-5 cell line. This may be due to the impact of the lipophilic trifluoromethyl substitution on the biological activity profile		
7	Synthesis of pyrazolo-1,2,4-triazolo[4,3-a]quinoxalines as antimicrobial agents with potential inhibition of DHPS enzyme.	Synthetic chemistry and drug design	The development of a new class of antimicrobial agents is the optimal lifeline to scrap the escalating jeopardy of drug resistance. This study aims to design and synthesize a series of pyrazolo-1,2,4-triazolo[4,3-a]quinoxalines, to develop agents having antimicrobial activity through potential inhibition of dihyropteroate synthase enzyme. The target compounds have been evaluated for their in-vitro antimicrobial activity. Compounds 5b, 5c were equipotent (minimal inhibitory concentration = 12.5 µg/ml) to ampicillin. The docking patterns of 5b and 5c demonstrated that both fit into Bacillus Anthracis dihydropteroate synthase pterin and p-amino benzoic acid-binding pockets. Moreover, their physicochemical properties and pharmacokinetic profiles recommend that they can be considered drug-like candidates. The results highlight some significant information for the future design of lead compounds as antimicrobial agents.	2018	https://pubmed.ncbi.nlm.nih.gov/30088415/