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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.1 to 14

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 Year 2019				
Sr. No	**Title of paper**	**Name of the author/s**	**Name of journal**	**Is it listed in UGC Care list**
1	Optimization study of defluoridation from water using seashell powder	Dr. Ranjit N. Patil	"Multidimensional Role of Basic Science in Advanced Technology" ICMBAT	Scopus Index
2	"Experimental study investigation of rice husk ash on concrete"	Prof. N.R.Gautam, Dr. R.N.Patil	"Multidimensional Role of Basic Science in Advanced Technology" ICMBAT	Scopus Index
3	Analysis of the Behavior of High-Rise Structures with Viscoelastic Dampers Installed at Various Locations	Snehal N.Raut,Rohan M.,A.Jain,V. Mehta	Advances in Intelligent Systems and Computing	Springer (SCI)
4	"Analysis and Characterizations of Modified Caesalpinia Bonduc (MCB) Seed Coat in the Process of Defluoridation"	R.N.Patil, P.B.Nagarnaik, B.J.Godbole	Smart Technologies for Energy, Environment and Sustainable Development	SCI
5	Seismic Analysis of Multistorey SMRF Building in Zone III and Zone V	Mr.Nitesh B. Thikare,	Journal of Advanced Research in Dynamical & Control Systems	Scopus Index
6	Structural and morphological characterization of mixed spinel nano ferrites and CaW nano hexaferrite	Dr. (Mrs) A. R. Golhar	International Journal of Current engineering and scientific research	Scopus Index
7	Molecular Docking Technique Assisted Discovery of Some Hydroxylated Chalcone Molecules as αglucosidase Inhibitors"	Dr. A. C. Haldar	Research Reviews: A Journal of Drug Design Discovery,	Scopus Index
8	ProteinTyrosine Phosphatase1B (PTP1B) Inhibitory Perspectives of Hydroxylated Chalcones: Exploration through Docking	Dr.A.C. Haldar	Research Reviews: A Journal of Bioinformatics	Scopus Index

	Studies"			
9	Hydroxylated Chalcone Derivatives as Future Aldose Reductase Inhibitors: Discovery through Docking Technique"	Dr. A. C. Haldar	Research Reviews: Journal of Computational Biology	Scopus Index
10	Exploring the antibreast cancer (against MCF7 Cell Line) potentials of uracil substituted hippuric acid based 1,3,4 thiadiazole compound	Dr. A. C. Haldar	International journal of pharmacy life sciences	Scopus Index
11	Design of Dual Antenna Passive Repeater based Machine Learning	Dr. P.R. Bokde	IOSR Journal of Engineering	Scopus Index

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Principal

Optimization Study of Defluoridation from Water Using Seashell Powder

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Abstract. World wide it has been observed that higher fluoride concentration in water can lead endemic diseases. In many parts of rural area, the ground water is the main source of drinking water. In the present study main objective of is to check feasibility of removal of fluoride from groundwater by solid waste adsorbents Seashell powder (SSP). The raw material were collected and physicochemical characterization of the adsorbent has been done by using standard methods e.g. sieving, proximate analysis, pHpzc, SEM, XRD. Different dose of adsorbent were used ranging from 0.5 to 5.5 gm/L of fluoride aqueous solution. Equilibrium sorption studies were conducted at room temperature (i.e 30°C) with varying fluoride concentrations (2 to 16 mg/L). Sorption experiments were also carried out at various pH (2- 14) to understand the effect of pH on removal was studied for 15- 1440 minute. The temperature range for the study was taken from 293K to 313K. All the batch study was performed at the orbital shaking incubator. The optimum dose & equilibrium time was found 4mg/L & 480 min respectively. Various kinetic models and equilibrium study is done have been study for the present work to investigate the adsorption process of fluoride onto SSP. The value of thermodynamic parameter ΔH indicated an exothermic adsorption process and the negative value of ΔG show the feasibility and spontaneity of material-anion interaction.

INTRODUCTION

The major containments includes heavy metals such as iron, arsenic, lean, mercury, chromium, cadmium, and inorganic ions such as fluoride, nitrate, chlorides, and sulphates etc. Among all the fluorides is one of the most toxic containments present in water [1]. Fluorine is considered as the most highly reactive element of halogen family of periodic table. It accounts for about 0.3g/kg of the earth's crust and exists in the form of fluorides in a number of minerals in many rocks. Most of the fluoride is associated with monovalent cations such as NaF and KF is water soluble, while the one formed with divalent cations such as CaF_2 and PbF_2 is generally insoluble [2]. It is the most electronegative of all elements.

MATERIALS AND METHODS

Adsorbent Collection and Preparation

Seashell is collected & called from the Chennai. Since seashell is very hard physical, so initially it was crushed in a small mould with the help of rammer and then washed with 0.01N HCl solution and allowed to dry in oven for 3-4 hrs [3]. Further washed material is pulverized in kitchen mixer followed washing de-ionized water followed by drying in an oven at 110 °C for 24 hrs. After the developing of adsorbent these materials are stored in dry bottles for use. The dried powder was sieved well with 75µm mesh size particles. The prepared material was preserved and again it is washed with de-ionized water followed by oven drying for 24 hrs as shown in Fig.1. The prepared material is sent for the chemical composition test and the outcome is graphically shown in Fig.3.

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Experimental Study Investigation of Rice Husk Ash on Concrete

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Abstract. The research investigation, effect of Rice Husk Ash on Concrete performed on laboratory scale, in which the (OPC) cement has been replaced by RHA with in terms of percentage by weight such as 12.5% and 25% of cement for 0.45 water/cement ratio. The laboratory analysis proved the compressive strength at 12.5% replacement of cement with RHA. This is the minimum content of RHA gives the better results in this study. Many of the analysis tests were performed such as, Standard consistency test, setting time test, soundness test, workability test and compressive strength test. This test proves the similarity of results obtained with the same laboratory conditions with OPC. The results were compared to controlled sample and the viability of adding RHA to concrete was verified. The minimum RHA content has been used as a pozzolanic material in cement and concrete. RHA provides several advantages, such as strength and durability properties, and environmental benefits related to the disposal of waste materials and to reduced carbon dioxide emissions. The use of RHA cement concrete improved stability reduced the heat generation and shrinkage. It strengthens transition zone i.e modifying the pore structure in the hydrated cement paste.

Keywords - Rice husk ash, Mix design, compressive strength.

INTRODUCTION

In Civil Engineering 'Cement' plays an important role. It is impossible to produce any sustainable infrastructure without use of cement.[1] Rice husk ash (RHA) is a by-product from the burning of rice husk. Rice husk is extremely prevalent in East and South-East Asia because of the rice production in this area. The rice husk ash is then used as a substitute or admixture in cement. The byproduct husk generated in the process of rice milling which is the surrounds of the paddy grain. During milling of paddy about 78 % of weight is received as rice, broken rice and bran and rest 22 % of the weight of paddy is received as husk. This husk contains about 75 % organic volatile matter and the balance 25 % of the weight of this husk is converted into ash during the firing process, is known as rice husk ash (RHA). [5,6]

This RHA in turn contains around 85 % - 90 % amorphous silica. So for every 1000 kgs of paddy milled, about 220 kgs (22 %) of husk is produced, and when this husk is burnt in the boilers, about 55 kgs (25 %) of RHA is generated. Pozzolanas are materials containing reactive silica and/or alumina which on their own have little or no binding property but, when mixed with lime in the presence of water, will set and harden like cement.[6] Pozzolanas are an important ingredient in the production of alternative cementing materials to Portland cement (OPC). It has observed that, alternative cements provide an excellent technical option to OPC at a much lower cost and have the potential to make a significant contribution towards the provision of low-cost building materials and consequently affordable shelter.[6,7] A wide variety of siliceous or aluminous materials may be pozzolanic, including the ash from a number of agricultural and industrial wastes from them the rice husk has been identified as having the greatest potential as it is widely available and, on burning, produces a relatively large proportion of ash, which

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Analysis of the Behavior of High-Rise Structures with Viscoelastic Dampers Installed at Various Locations

Snehal N. Raut, Rohan Majumder, Aman Jain and Vinay Mehta

Abstract It is essential to analyze the behavior of each and every tall structure in the perspective of structural engineering when subjected to severe ground motion or earthquake. Vibratory forces are produced due to the result of such earthquakes at the base of the structure. Oscillations are created in buildings as a result of these vibrations. Such oscillations may cause severe damage to the structure. From the ground level, the vibrations get transmitted up to the top of the building and since the structural mass which creates lateral forces on the frame, the moment resisting capacity gets diminished for that of building components such as columns, beams, etc. This paper gives an idea of the different research works executed on a multi-storey building frame by taking various parameters into account. It explains the results of a study on the seismic behavior of a tall structure (G+15) installed with a damper. From a previously conducted experiment, it has been expressed that the stiffness and the strength of the structure enhances considerably with the use of such dampers. The current work aims to analyze the behavior of a multi-storeyed building for the most efficient location of viscoelastic damper in the structural system. A standard finite element software is used to carry out the analysis. Various parameters like lateral storey drift, base shear, time period, modal shapes, etc., are being analyzed and evaluated for the damper being placed at different locations.

Keywords Ground motion · Dampers · Base shear · Modal shapes

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D. Deb et al. (eds.), *Innovations in Infrastructure*, Advances in Intelligent Systems and Computing 757, https://doi.org/10.1007/978-981-13-1966-2_16

Analysis and Characterizations of Modified Caesalpinia Bonduc (MCB) Seed Coat in the Process of Defluoridation

Ranjit N. Patil, P. B. Nagarnaik and B. J. Godbole

Abstract The researchers and philosophers mainly focused on the quality and quantity of drinking water from last some decades. In this research investigation, the seed coats of Caesalpinia bonduc were found a predominant promising herb for the defluoridation from ground water. Method of adsorption was selected for analysis and experimental program for the range of pH (2–14), dose (0.5–5.0 g/L), time of contact (0–420 min), initial concentration of fluoride (2.5–15 mg/L), particle size (75–600 μm) with the agitation speed (150 rpm). Analyzed data checked for isotherms and found well fitted in case of Langmuir isotherm.

Keywords Fluoride · Adsorption · TCM · Isotherm

1 Introduction

Water is an elixir for life. But today pure drinking water has become a scarcity. Majority of the population is drinking more or less contaminated water. There are different reasons for the contamination of water like natural forces and industrial effluent. The major reason for contamination of water is fluoride [1]. Water scarcity is a global problem; where 2 billion peoples are affected. India is also facing the same crisis where millions of people are not able to get pure drinking water and are compelled to drink contaminated water. Poor sections of the society are deprived of pure drinking water and are consuming contaminated water, eventually they fall ill

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Seismic Analysis of Multistorey SMRF Building in Zone III and Zone V

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Abstract— **This study is carried out to investigate the seismic behaviour of SMRF (Special Moment Resisting Frames) building using software i.e .STADD PRO. The poor performance of Ordinary Moment Resisting Frame (OMRF) in past earthquakes suggested that, the special design and detailing to require arresting a ductile behaviour seismic zone of high earthquake (zone III, IV & V). STAAD Pro software and using the codes for analysis IS 1893 (PART 1):2002, IS 456: 2000, IS 13920.**

The building is analyzed for seismic zone no III and V. The parameters computed and compared are displacement, axial force, shear force, moment etc. Comparison is made for the behavior of building frame considering response reduction factor under earthquake forces. The G+6 building is considered for modeling. The base area is 25.2m*16m. Height of floor is 2.8m. The overall height of building is 16.8m.

For adequate toughness and ductility to resist the severe earthquake shocks without collapse, Beams, columns, and beam-column joints are proportioned and detailed as per I.S. code 13920. Thus it has been studied and observed that SMRF structures behave well in earthquake than OMRF structures.

Keywords— Earthquake, OMRF, SMRF, STAAD Pro , Seismic Zones.

I. INTRODUCTION

Earthquake is the sudden release of energy due to the shaking of ground. Large scale damage occurs during several moderate earthquakes in recent years which indicate, despite such early gains, earthquake risk in the country has been increasing alarmingly. In high earthquake regions of the country most of the buildings continue to be built without appropriate earthquake resistant features.

India is divided into different seismic zones. As per IS 1893:1984 Code India is divided from Zone I to Zone V. But as per IS 1893:2002 Code it has been divided from Zone II to Zone V. Zone I has been discarded.

OMRF (Ordinary Moment Resisting Frame) AND SMRF (Special Moment Resisting Frame):

Framing system depends upon two important parameters of particular type i.e. seismic risk of the zone and the budget. As per the Indian Codes the entire country divide into four seismic zones (i.e. Zone II, III, IV, V) depending on the seismic risks. The most commonly adopted type of frame in lower seismic zones is probably OMRF, with the increase in the seismic risks, it becomes necessary to adopt SMRF system. OMRF is generally adopted for zone II to IV because the probability of coming earthquake in these zones is less and SMRF is specially adopted for zone V because the probability of coming earthquake in this zone is more.

The criteria for comparison is based on various parameters like Displacement in X and Z direction, Axial force, Shear force and Moment in X and Z direction.

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STRUCTURAL AND MORPHOLOGICAL CHARACTERIZATION OF MIXED SPINEL NANO-FERRITES AND CA-W NANO HEXAFERRITES.

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ABSTRACT

Nanoparticles of mixed spinel ferrite having generic formula of $(NiZn)xCu_{1-2x}Fe_2O_4$ and hexagonal Ca-W ferrite of formula $Ca_2Co_{2-x}Ni_xFe_{16}O_{27}$ were respectively prepared by sol gel auto combustion method and co-precipitation method. The prepared samples were annealed for 4 hrs at 800°C to obtain the pure phase of Ni-Zn spinel ferrite and W-type Hexagonal ferrite. The X-ray diffraction confirmed the typical soft ferrite structure in spinel and magnetoplumbite hard ferrite structure formation of the ferrites with a single phase. The morphological characterization was done by using scanning (SEM) and transmission electron microscopy (TEM) respectively. The SEM reveals the randomly oriented cubic shape particles for spinel ferrite and a plate- like hexagonal structure for Ca-W ferrite. TEM counter-verified the cubic shape and further confirms that prepared sample lies within the nano meter scale. The Ca-W ferrite was studied for concentrations (x= 0, 1 and 2) for the effects of Ni^{2+} cationic substitution for Co^{2+} on the structural properties.

Keywords: Spinel ferrites, Hexa ferrites, auto combustion, co-precipitation, X-ray diffraction, SEM and TEM.

1. INTRODUCTION

The ferrites are the magnetic materials exhibiting properties which are commercially used for magnetic storage, microwave absorption and permanent magnets. The different types of ferrites include spinel type, garnet type and hexagonal ferrites. The ferrites with cubic structure known spinel ferrites are extensively attractive only because of its good performance and broad range of applications but there are also a group of ferrites with a hexagonal crystal structure, also known as hexaferrites.[1]Hexaferrites have a hexagonal crystal structure. The existing six types of hexaferrite structures are designated as: M, Y, Z, W, X and U. The general formulation of hexaferrites is MxMez(Fe2O3)y, the ratios of x/y for M, Y, Z, W, X and U are 1:6, 1:3, 1:4, 1:8, 1:7 and 2:9, respectively [2-4]. M in the chemical formula of hexaferrites represents the ions of Ba, Sr, Pb, Ca, La, and Me is usually transition element (Zn, Mn, Co, etc.). As is the same in the spinel structures, the substitution of Fe^{3+} ions can be other trivalent cations such as Al^{3+}, Cr^{3+}, etc.The Ni-Zn nanoparticles ferrite has a unique chemical and structural behaviour that makes it the prolific material in many medical and technological applications such as magnetic delivery of drugs, ferrofluids, MRI, recording media etc. The size of spinel ferrite if confined below 25 nm then the exceptional property called as superparamagnetism occurs that offers outstanding opportunities in manipulation of nanoparticles to enhance the various applications. Numerous synthesized methods are available to prepare the spinel ferrites viz. sol-gel auto combustion, co-precipitation, hydrothermal, solid state, miscelles, microemulsion etc. The present research work aimed to prepare the Ni-Zn mixed ferrites via two different chemical routes to understand how different synthesis methods

Research & Reviews: A Journal of Drug Design & Discovery

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Molecular Docking Technique Assisted Discovery of Some Hydroxylated Chalcone Molecules as α-glucosidase Inhibitors

Santosh S. Chhajed, Neha A. Salunke, Animeshchandra G.M. Haldar, Kanhaiya M. Dadure, Debarshi Kar Mahapatra

Abstract

The present study involved exploration of the inhibitory potential of some A-ring hydroxylated chalcone compounds against PDB ID: 2QMJ file (Maltase-glucoamylase in complex with acarbose) with the assistance of iGEMDOCK (Genetic Evolutionary Method for Molecular Docking) software. The present study highlighted the immense potentials of several unexplored hydroxyl group (in ring-A) containing chalcones in successfully inhibiting the one of the most effective anti-hyperglycemic based enzymatic target α-glucosidase. The research has pointed out several key structural features which are truly essential for inhibiting the biological target, thereby resulting in expressing significantly better management of hyperglycemic surge. The type, position and the number of substituents present on the aromatic ring-B of the benzylideneacetophenone scaffold have played enormous function in mediating the pharmacological responses by directly interacting with the amino acid residues (ASP443, ASP542, ARG526, HIS600, TRP406, GLN603, and TYR605) present in the active site of the enzyme. The study outcomes will positively inspire the medicinal chemists and allied pharmaceutical researchers across the globes who are actively involved in the vast area of drug design, discovery, and development. The emerging docking results will provide directions towards effectual development of low-molecular-weight ligands in the anti-diabetic pharmacotherapeutics.

Keywords: *Chalcone, α-glucosidase, diabetes, hypoglycemic, docking, inhibitor*

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Protein-Tyrosine Phosphatase-1B (PTP-1B) Inhibitory Perspectives of Hydroxylated Chalcones: Exploration through Docking Studies

Santosh S. Chhajed[1], Neha A. Salunke[1], Animeshchandra G.M. Haldar[2], Kanhaiya M. Dadure[3], Debarshi Kar Mahapatra[4,*]

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Abstract

The current research emphasized on exploring the Protein-Tyrosine Phosphatase-1 B (PTP-1B) inhibitory potentials of hydroxylated chalcone derivatives against PDB ID: 4I8N (PTP-1B in complex with an inhibitor [(4-{(2s)-2-(1,3-benzoxazol-2-yl)-2-[(4-fluorophenyl)sulfamoyl]ethyl}phenyl)amino](oxo)acetic acid) by molecular docking approach using the iGEMDOCK (Genetic Evolutionary Method for Molecular Docking) software. The current molecular docking analysis of some hydroxylated chalcone derivatives have presented a profound inhibition of the antidiabetic target PTP-1B by interacting with the amino acid residues such as TYR46, ASP48, ASP181, ASP182, GLY200, CYS215, SER216, ALA217, ARG221, and GLN262 through hydrogen bonding. The hydroxyl group at 3- and 4-positions of A-ring and several electron-donating and electron-withdrawing groups at B-ring of the benzylideneacetophenone scaffold have been seen to exert an enormous role in inhibiting the phosphorylating enzyme. The complete inhibition of this new biological target by low-molecular-weight ligand will open new avenues of modern diabetic therapeutics and will motivate the present-day researchers in emerging pharmacological research.

Keywords: *Chalcone, PTP-1B, diabetes, hypoglycemic, docking*

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INTRODUCTION

Protein-Tyrosine Phosphatase-1B (PTP-1B) is relatively a new molecular target identified by the scientists in the management of diabetes mellitus. It is an intercellular non-receptor PTP, chiefly located into the cytoplasmic face of the endoplasmic reticulum. It is universally expressed in all biochemical functions and plays a principal role in the classical insulin-targeted tissues such as skeletal muscles and fat. PTP-1B along with receptor protein tyrosine phosphatase (rPTP-a), leukocyte antigen-related tyrosine phosphatase (LAR), and SH2-domain-containing phosphotyrosine phosphatase (SHP2) are the prime negative regulator of the insulin which dephosphorylates the insulin receptor (IR), insulin receptor substrate-1 (IRS-1), and insulin receptor substrate-2 (IRS-2) and are also known to deregulate the leptin-signaling pathway. Inhibition of this molecular target will lead to possible enhancement in the insulin level, drastically improves cellular sensitivity, reduces obesity, and increases the uptake of glucose [1, 2].

With the passage of time, the existing anti-hyperglycemic classes of drugs such as guanidines, sulfonylureas, glitazones, etc. are becoming resistant [3]. Majority of the insulin sensitizers; either prescribed singly or in fixed-dose combination, has failed to show adequate

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Hydroxylated Chalcone Derivatives as Future Aldose Reductase Inhibitors: Discovery through Docking Technique

Santosh S. Chhajed, Neha A. Salunke, Animeshchandra G. M. Haldar, Kanhaiya M. Dadure, Debarshi Kar Mahapatra*

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Abstract

The research endeavors molecular docking assisted exploration of ALR inhibitory perspectives of some B-ring substituted hydroxyl group (A-ring) containing chalcone compounds against human aldose reductase in complex with NADP$^+$ and the inhibitor IDD594 (PDB ID: 1US0) by utilizing the iGEMDOCK (Genetic Evolutionary Method for Molecular Docking) software. The present investigation immensely focused on the human aldose reductase inhibitory perspectives of some hydroxylated chalcone compounds. The inhibition of the enzyme by precisely interacting with the amino acid residues such as TRP20, TRP29, TYR48, THR113, TYR209, SER210, and CYS298, showed the importance of various electron-donating and electron-withdrawing groups, their position on aromatic ring-B, and the number of substituents. The benzylideneacetophenone scaffold bearing molecules presented a noteworthy inhibition of the anti-diabetic target which is predicted to effectively manage the budding complications and will simultaneously enhance the QoL to the highest possible extent. The study will moreover inspire the medicinal chemists, pharmacists, pharmacologists, and clinicians in further researching, development, betterment, and utilization of small therapeutically effectual drugs for the management of diabetes mellitus.

Keywords: *Chalcone, Aldose Reductase, Diabetes Mellitus, Hypoglycemic, Docking, Inhibitor*

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INTRODUCTION

Diabetes mellitus (DM) is a chronic disease that causes several life-long complications such as polydipsia (excessive thirst), polyphagia (excessive hunger), polyurea (excessive passage of urine), glucosuria (glucose in urine), ketoacidosis (smell of acetone in breath), etc. which execrably reduces the quality of life (QoL) in patient [1]. In another case, aldose reductase (ALR), an enzyme belongs to the aldo-keto reductase (AKR) superfamily of the polyol pathway has been identified as a key culprit in mediating the DM oriented complications which leads to extreme decrease in sufferers' QoL [2]. When the normal glycolytic cycle gets saturated, the polyol pathway gets activated as an alternative route for glucose metabolism. This polyol pathway enzyme converts the excess glucose into sorbitol in the absence of insulin, which accumulates in the tissue and cause change in membrane permeability, produce osmotic swelling, and oxidative stress in the tissue [3]. When left untreated, it leads to retinopathy, cataract, nephropathy, and neuropathic pain that result in abrupt decline in the QoL of individual [4].

Inhibition of this enzyme will be an attractive way to enhance the QoL of the patients, as the

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Exploring the anti-breast cancer (against MCF-7 Cell Line) potentials of uracil substituted hippuric acid based 1,3,4-thiadiazole compound

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Abstract

In the previous research done, uracil moiety substituted hippuric acid containing 1,3,4-thiadiazole scaffold was rationally designed, synthesized, and screened for anti-diabetic activity using the streptozotocin-induced hyperglycemic method in Swiss albino rats. In the current research, the same compound *N*-((5-(((2,6-dioxo-1,2,3,6-tetrahydropyrimidin-4-yl)methyl)amino)-1,3,4-thiadiazol-2-yl)methyl)benzamide was screened against MCF-7 breast cancer cell line utilizing the Sulforhodamine B (SRB) assay and further the IC_{50} value was established in comparison with capecitabine, the standard drug. The study highlighted a notable anti-breast cancer activity against breast cancer cell line MCF-7 by the uracil substituted hippuric acid based 1,3,4-thiadiazole compound. The activity of the compound was although not analogous to the positive control drug capecitabine, as indicated by the IC_{50} value. The combination of hippuric acid, 1,3,4-thiadiazole, and uracil produced synergistic activity which arrested cell proliferation. The study will certainly open new avenues and provide direction towards anti-proliferative research by the rational hybridization of small molecules.

Keywords: 1,3,4-thiadiazole, Hippuric acid, Uracil, Anticancer, Hybrid, MCF-7

Introduction

Cancer is the second leading cause of death among the global population after cardiovascular disease. Breast and cervical cancer are the most prominent cause of death among females[1]. WHO has predicted a great pace in the appearance of new cancer cases after a defined interval of time. Even all the active international databases and organizations related to cancer demography and treatment have put breast cancer at high alert[2].

Earlier; surgical, chemotherapy, radiotherapy were the only options for the treatment or rather management to some extent, but not an absolute cure. Even in the majority of the pharmacotherapeutic regimen, long duration of chemotherapy by USFDA approved popular drugs leads to resistance conditions[3].

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This leads to an emerging need for a new series of drugs with high potency and lower toxicity. In the principle of drug discovery, exploration of unexplored chemical classes from both natural and synthetic sources with noticeable anti-proliferative activity, particularly anti-breast cancer activity, will be an attractive approach for the drug development [4]. Exploring synthetic heterocyclic compounds coupled with several small molecules, in other words, development of molecules by hybridization approach will be the most impressive way[5]. Thiadiazole is a very privileged scaffold in medicinal chemistry known to exhibit diverse pharmacological activities such as anti-convulsant, anti-trypanosomal, anti-cancer, anti-viral, anti-bacterial, anti-oxidant, anti-tubercular, anti-fungal, anti-leishmanial, anti-ulcer, anti-inflammatory, etc.[6]. Uracil is an imperative component of the human body which has prime role in the formation of DNA. It has several applications in the therapeutic area as anti-herpes, anti-cancer, anti-HIV-1, anti-Epstein-Barr, anti-varicella zoster,

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Design of Dual-Antenna Passive Repeater Basedon Machine Learning

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Abstract: *In 5G communications, Small cells are one of the main approaches to achieve data diversion and improve network capacity. The problem of blind area is partially solved by this way, because the distances between small base stations and users are cut short. However, the intensive deployment of small base stations will bring about complex disturbances and large amount of energy consumption. To overcome this challenge, we propose a new approach of dual antenna passive repeater, which consists of a four-element patch antenna array, a feeding network and an improved micro-strip antenna with added parasitic patches. It can be used in co-operation with small base stations to replace the function of the small base station in a certain point, change the beam pointing, and achieve wide-angle scattering to realize the blind area signal coverage. The unsupervised learning which is a branch of machine learning is used to optimize the antenna parameters. Simulation results show that our proposed passive repeater can effectively reduce the path loss and improve the signal power of the receiving end.*

I. Introduction

THE fifth generation (5G) of mobile communication system should have ultra-high spectrum utilization and ultralow power consumption, and will be significantly improved in transmission rate, resource utilization, wireless coverage performance and user experience, compared with 4G. The demand for future data traffic grows exponentially, and the most feasible solution to increase network capacity is cellular densification. However, more cellular network infrastructures and data lead to a huge energy consumption in mobile cellular networks, and Small Cell Networks (SCNs) technology therefore comes to its way. The small base stations with dense deployment are low in transmission power, close to the users, small in size and low in cost.

Intensive deployment of SCNs can also alleviate the problem of radio blockage in some blind areas. In the macrocellular mobile communication environment, the large penetration loss and reflection loss caused by barrier occlusion greatly weaken the signal level from the base station to the user's Non-Line-of-Sight (NLOS) path, dramatically reducing the efficiency of the data transmission and cutting down the Signal Noise Ratio (SNR). These areas constitute a blind areathatcan'tbeilluminated by the signal. The small base stations can be widely deployed in the narrow streets, high buildings in the commercial area, multiple wall-blocking indoor office areas, shopping malls, subway stations and other complex areas surrounded by walls, forming a full coverage of communication. These small base stations can effectively increase the channel capacity and improve the communication quality while realizing data shunting. However, there are many problems in the intensive deployment of small base stations.

i) The interference between the base stations is very serious and complex, causing severe impact on the user experience in the small cell, especially around the edge. Since the small cell has a smaller coverage radius and is closer to the user, the interference between small cell networks is more serious than that between traditional macro-cells. In a hybrid network, cross-layer interference also exists between small cells and macro-cells.

ii) The energy consumption of small cell network base stations is huge. Research statistics show that the energy consumption of the base station accounts for about 60 percent to 80 percent of the entire communication network. When there is less communication data transmission at night, the energy consumption of the base station will account for about 90.

Due to the random deployment and resource allocation of small base stations, it is difficult to find a balance between distance and quantity. In order to solve this contradiction, many passive repeaters are designed to be used in cooperation with the small base station to replace the function in a certain position. By installing a