Review of literature

The following is a brief description of the papers that are very important and closely related to our area of research inquiry and their order in the references is maintained.

1. Quinazolin-4-one: A highly important heterocycle with diverse biological activities:

Quinazolin-4-one and their derivatives have been studied extensively for various biological activities such as anti-inflammatory, antimicrobial, anticancer, anticonvulsant and anti-HIV activity etc. This review collates literature work reported by researchers on quinazoline and specifically quinazolin-4-one for their various pharmacological activities. This excellent review is helpful in the development of these novel lead molecules to potential drug candidates for future prospect[16].

2. Synthesis and in vitro antibacterial studies of some novel 3-(5-amino-6(2,3-dichlorophenyl)-1, 2, 4-triazin-3-yl)-2-aryl quinazoline-4(3H)-one

In the present study some new 3-(5-amino-6(2, 3-dichlorophenyl)-1, 2, 4-triazin-3-yl)-2-arylquinazoline-4(3H)-ones (3a-3f) were synthesized. Anthranillic acid on reaction with 4-methyl benzoyl chloride in sodium hydroxide followed by cyclization with acetic anhydride gave a crystalline compound in high yield. The mass spectrum of the compound revealed the molecular ion at m/z 237 indicating it to be an equimolar product formed by the elimination of elements of hydrogen chloride and water [17].

3. Synthesis, characterization and biological evaluation of 3,4-dihydro quinazoline 2(H)-one derivatives

This study presents a simple and general method developed for the synthesis of various 3,4-dihydro quinazolinone derivatives by the treatment of an aldehydes with excess equivalent of urea in ethanol affords Arylideno-bis-ureas 1 which on condensation with p-amino benzoic acid in acidic medium cyclised to 4-aryl-6-hydroxy-2-oxo-3,4-dihydro quinazolines 2. Reaction of 2 with benzoylchloride in 10% NaOH results in 1-benzoyl 4-aryl-6-hydroxy-2-oxo-3,4-dihydroquinazolin-2(H)-one[18].

4. Synthesis, Antibacterial and invitro Antioxidant Activity of 2,3-Substituted Quinazolin-4(3H)-ones

Quinazolinone and their derivatives have been studied extensively for various biological activities such as anti-inflammatory, antimicrobial, antitumor, antioxidant and anti-HIV activity. Schiff bases have also been exploited extensively for antimicrobial and
antioxidant activities. In the present investigation various quinazolinone amines have been clubbed with five membered heterocyclic aldehydes to obtain the title compounds [19].

5. Synthesis And Antimicrobial Activity of Some 2,3-Disubstituted Quinazoline-4 (3H)-Ones

In the present investigation an attempt has been made for the synthesis of 2-substituted 1, 3-benzoxazine-4-ones, using N-substituted anthranilic acid and acetic anhydride. Further these 2-substituted 1, 3-benzoxazine-4-ones has been condensed with various aliphatic and aromatic amines in equimolar concentration to give corresponding some new 2, 3-disubstituted quinazolin-4-(3H)-ones [20].


A new method has been designed to prepare the known benzoxazinone derivative 2-(N-phthaloylmethyl)-4H-3,1-benzoxazin-4-one. The acyl chloride derivative N-phthaloylglycine reacts with anthranilic acid in chloroform, in the presence of triethylamine, to give an intermediate that is then reacted with cyanuric chloride, used as a cyclization agent, to produce the benzoxazinone derivative [21].

7. Novel one-pot synthesis of schiff base compounds derived from different diamine & aromatic aldehyde catalyzed by P₂O₅/SiO₂ under free-solvent condition at room temperature

A potential method for one-pot synthesis of Schiff base compounds derived from different aldehyde and Di-amine compounds like substituted aromatic aldehyde and Diamines; such as Salicylaldehyde, 3,4-Tertery butyl 2-Hydroxy Benzaldehyde, Ethylene Diamine, 2-Amino Pyridine, 1, 2-Di-amino Benzene, 1, 3-Diamino Propane by using catalytic amount of P₂O₅/SiO₂ have catalyzed the ligand formation in dry media under free-solvent condition at room temperature. This type of excellent method avoids use of hazardous solvents, longer reaction time and tedious work up procedure. Advantage of this efficient method is excellent yield of products in crystalline form, short reaction time, simplicity of work up procedure and no use of any type of hazardous solvents. Simply this reaction is environmentally Proactive (non polluted) and economically attractive method for synthesis of Schiff base compound [22].

8. Spectroscopic studies and structure determination of Schiff base derived from 5-bromo salicylaldehyde and 4-aminobenzoic acid

The 4-(5-bromo-2-hydroxybenzylideneamino) benzoic acid was structurally characterized (monoclinic space group P21/c, unit cell dimensions a = 2857.63(8) pm,
b = 686.90(2) pm, c = 612.35(2) pm, β= 94.411(3)°. It forms dimers in the solid state which are connected by intermolecular hydrogen bonds between the COOH groups[23].


Combinatorial chemistry is a new technique developed in pharmaceutical industry, which involves synthesis of compounds in mass instead of a single compound, which are screened as a whole mixture for particular biological activity. This brief review article includes combinatorial strategies, screening methods and encoding technologies and some of the applications in drug discovery [24].


Series of non peptide angiotensin (A-II) receptor antagonist has been prepared by 4’-{2-[4-[3-chloro-2-(substituted-phenyl)-4-oxo-azetidin-1-yl]-phenyl]-benzoimidazol-1-ylmethyl}-biphenyl-2-carboxylic acid were synthesised by 2-(4-aminophenyl) Benzimidazole (0.01 mol), substitutedBenzaldehyde (0.01 mol) and a drop of acetic acid was dissolved in ethanol (25 ml) and heated on a steam bath for 45-60 min Chloroacetyl chloride (0.01mol) was added drop wise to a mixture of schiff base (0.01mol) and triethylamine (0.02 mol) in dioxane (25 ml) at room temperature Schiff bases react with biphenyl carboxylic acid with different substituents aryl group cyclocondensation with appropriate reagents[25].

11. Synthesis, Characterisation of some 2-azetidinone derivatives from 2-aminopyridine and evaluation of their antimicrobial activity

In this study 2-aminopyridine is condensed with different substituted aromatic aldehydes to form respective Schiff base. It was cyclised with chloro acetyl chloride to yield corresponding azetidinones. The activities are due to cyclic CO-NH group in azetidinones. The activity of the famous antibiotics such as penicillins, cephalosporins, monobactams and carbapenems are attributed to the presence of 2-azetidinone ring in them [26].

12. Synthesis and antihypertensive activity of 4’-{2-[4-2- (Substitutedphenyl)-4-oxothiazolidin-3-yl]-phenyl]benzoimidazol-1-ylmethyl}-biphenyl-2-carboxylic acids

Many Schiff bases were prepared by condensation reaction of compounds containing biphenyl carboxylic acid with aromatic aryl aldehydes derivatives with Thiazolidine-4-one. The synthesized compounds 4’-{2-[4-[2-(Substituted-phenyl)-4-oxo-thiazolidin-3-yl]-phenyl} benzoimidazol-1-ylmethyl]-biphenyl-2-carboxylic acid react with mercaptoacetic acid and 4’-bromomethylbiphenyl-2-carboxylic acid and all synthesis compounds screened for Angiotension (A II) Receptor Antagonist antihypertensive activity with biphenyl carboxylic
acid Schiff bases Thiazoldine-4-one shows good activity compared with losartan and Telmisartan[27].

13. Synthesis and biological activity of 4-bromo-2-hydroxy-N-(5-methylene-4-oxo-2-aryl-thiazolidin-3-yl) benzamide

4-bromo-2-hydroxy benzoic acid hydrazide (1) undergoes facile condensation with aromatic aldehydes to afford the corresponding 4-bromo-2-hydroxy benzoic acid aryldiene hydrazides(2a-h) in good yields. Cyclocondensation of compounds (2a-h) with thioglycolic acid yields4-bromo-2-hydroxy- N (4-oxo-2-aryl- thiazolidin -3-yl) benzamides (3a-h). These (3a-h) compounds are for the reacted with benzaldehyde in the presence of sodium ethanolate affords, giving 4-bromo-2-hydroxy-N(5-methylene-4-oxo-2-aryl-thiazolidin-3-yl)benzamides (4a-h) [28].

14. Studies on synthesis and Dyeing Performance of disperse azo dyes based on Schiff base of ninhydrin and 3-amino phenol

Coupling of various diazo solution of benzene derivatives prepared some new disperse azo dyes which are based on Schiff base of ninhydrin and 3-amino phenol. The UV-Visible spectral data have also been discussed in terms of structural property relationship. All the disperse azo dyes were applied on polyester textile fibers. The percentage dye bath exhaustion and fixation on the polyester fibers have been found to be very good. Moderate to very good light fastness and washing fastness properties were indicated by the dyed fabrics. The glycine and ninhydrin reaction is an example of nucleophilic addition of amino to carbonyl group and proceeds to the formation of Schiff bases [4]. These Schiff base may be having good biological activities because ninhydrin is itself an important reagent in bimolecular reaction. The area for synthesis of azo dyes bases on these Schiff bases has not been developed so far. Hence it was to explore the studies of azo dyes based on these Schiff base [29].

15. Treatment of water contaminated with Reactive Red 198 (RR198) by Photo-Fenton Reagent

This study was conducted to assess the removal efficiency of azo dye Reactive Red 198 (RR198) from aqueous medium using the Photo- Fenton process. The Fenton reagent that consists of a mixture of hydrogen peroxide (H₂O₂) and Ferrous ions (Fe⁺₂) was used to generate the hydroxyl radicals (OH) that attacks the target contaminant and degrade it. The influence of the main parameters (concentration of Dye (RR198), concentration of photocatalyst (Fenton reagent,(H₂O₂ and p⁺H) that govern the degradation kinetics was evaluated. The optimum conditions for the photobleaching of dye had been established. The
kinetics of degradation of the dye in the dilute aqueous solutions follows first order kinetics. Complete mineralization of dye RR198 is achieved by Photo- Fenton reagent. The photobleaching process follows first order kinetics in respect to Langmuir-Hinshelwood model.

In recent years, advanced oxidation processes (AOPs) have emerged as contemporary oxidative technique for degradation of detrimental organic compounds. Advanced oxidation processes (AOPs) have provided innovative, cost-effective catalyzed chemical oxidation for treating pollutants in low or high concentration from contaminated soil, sludge and water [30].

16. Material applications of novel heterocyclic disperse and mordent dyes based on 2-butyl-3-(4-hydroxybenzoyl)benzofuran

The novel mordent and disperse heterocyclic dyes were prepared by coupling of various diazo solution of aromatic amines with 2-Butyl-3-(4-hydroxybenzoyl)benzofuran. The UV-visible spectral data have also been discussed in terms of structural property relationship. The dyeing assessment of all the mordent and disperse heterocyclic dyes was evaluated on wool and polyester textile fibers [31].

17. Biodegradation of sulphonated azo dye C.I. reactive orange 16 by Enterococcus faecalis strain YZ 66

Textile dye Reactive orange 16 was selected for biotransformation studies by Enterococcus faecalis YZ 66. Optimization of parameters for dye decolourization were studied under static anoxic condition. Under optimized condition decolourization of Reactive orange 16 by Enterococcus faecalis YZ 66 was found to be 77.73% in 80 minutes. Degradation of the dye was confirmed by UV- Visible spectrophotometric, TLC, and HPLC analysis. The isolate had potential to decolourize mixture of five dyes. This indigenous isolate could be a potential organism for bioremediation of textile wastewater carrying dyes [32].

18. Synthesis, characterization and biological activity of 1,3,4-substituted 2-azetidinones

Amido/imidoalcohol/2-phenyl-3-hydroxyethylquinazolin-4 (3H)-one 1 on treatment with benzoic acid in the presence of concentrated H$_2$SO$_4$ yields m-(aralkylamido/imidoalkyl/2-phenyl-3-ethyl-3H-4-oxoquinazolinyl) benzoic acids 2. The acid chloride of 2 on reaction with hydrazine hydrate affords m-(aralkylamido/imidoalkyl/2-phenyl-3-ethyl-3H-4-oxoquinazolinyl) benzoic acid hydrazides 4 which on condensation with an aromatic aldehyde in acetic acid gives m-(aralkylamido/imidoalkyl/2-phenyl-3-ethyl-3H-4-oxoquinazolinyl) benzoic acid hydrazones 5. Compounds 5 undergo cyclization with
phenoxy acetic acid in the presence of thionyl chloride in dry benzene to furnish 1-
(m-(aralkylamido/imidoalkyl/2-phenyl-3-ethyl-3H-4-oxoquinazoliny) benzamido)]-3-phenoxy-
4-phenyl-2-azetidinones 6. [33].

19. Synthesis, spectral and microbial studies of 3-{4-[2-methyl-4-(4-methoxy benzylidene)-5-oxo-imidazol-1-yl]phenyl}-2-(substituted phenyl)-1,3-thiazolidin-4-one
3-{4-[2-methyl-4-(4-methoxybenzylidene)-5-oxo-imidazol-1-yl]phenyl}-2-(substituted phenyl) -1,3-thiazolidin-4-one have been prepared by the refluxation for 8 hours of 4-(4-
methoxybenzylidene)-1-{4-[(substituted benzylidene)amino] phenyl}-2-methyl-imidazol-5-
one with thioglycolic acid and anhydrous zinc chloride in presence of ethanol. The intermediate 4-(4-methoxybenzylidene)-1-{4-[(substituted benzylidene)amino] phenyl}-2-
methyl-imidazol-5-one synthesized by the condensation of 1-(4-aminophenyl)-4-(4-
methoxybenzylidene)-2-methyl-imidazol-5-one with various aldehydes[34].

20. Synthesis of 4-(4-hydroxybenzylidene)-1-{4-[3-(substitutedphenl)prop-2-enoyl] phenyl}-2-methyl-imidazol-5-one
4-(4-hydroxybenzylidene)-1-{4-[3-(substitutedphenl)prop-2-enoyl]phenyl}-2-methyl-
imidazol-5-one have been prepared by the refluxation for 10 hours of 1-(4-acetylphenyl)-4-(4-
hydroxybenzylidene)-2-methyl-imidazol-5-one with substituted benzaldehyde in presence of ethanol. The intermediate 1-(4-acetylphenyl)-4-(4-hydroxybenzylidene)-2-methyl-imidazol-5-
one synthesized by the condensation of 4-(4-hydroxybenzylidene)-2-methyl-1,3-oxazol-5-one with 1-(4-aminophenyl) ethanone in presence of pyridine[35].