REVIEW OF LITERATURE

1. **S Jantova et. al. (2003)** studied the cytotoxic activity of 9-bromo-5-morpholino terazolo[1,5-c] quinazoline compounds on murine leukemia cell line L 1210 and human colon carcinoma cells Caco-2. They found that they manifested a concentration dependent and time dependent cytotoxic effect.

2. **B Shivarama Holl et .al.(2003)** Synthesis characterization and anticancer activity studies on some Mannich bases derived from 1,2,4-triazoles. The newly synthesized mannich bases were screened for their anticancer activity against a panel of 60 cell lines derived from seven cancer types namely, lung, colon, melanoma, renal, ovarian, CNS and leukemia. Some of the compounds were slightly more potent.

3. **Akinori Iwashita et. al .(2005)** prepared two classes of quinazoline and quinoxaline derivatives which were identified as potent and selective poly- (ADP-ribose) polymerase-1 and 2 (PARP-1) and (PARP-2) inhibitors, respectively. In PARP enzyme assays using recombinant PARP-1 and PARP-2, quinazolinone derivatives displayed relatively high selectivity for PARP-1.

4. **Sheng- Li Cao et. al .(2005)** synthesized 4(3H)-quinazolinone derivatives with dithiocarbamate side chains. When tested for their invitro antitumour activity against human myelogenous leukemia K562 cells, they showed promising results.

5. **Sarah T Al-Rashood et .al .(2006)** designed a series of quinazoline analogs resembling methotrexate and molecular modeling studies were done. The synthesized compounds were evaluated for their ability to inhibit mammalian DHFR in vitro and for their antitumor activity in a standard in vitro tissue culture assay panel. Most of them showed good activity.
6. **Matysiak et. al. (2006)** introduced a series of N-substituted 2-amino-5-(2,4-dihydroxyphenyl)-1,3,4-thiadiazoles were synthesized and evaluated for their antiproliferative activities against human cancer cell lines. The cytotoxicity in vitro against the four human cell lines: SW707 (rectal), HCV29T (bladder), A549 (lung), and T47D (breast) was determined. The highest antiproliferative activity was found for 2-(2,4-dichlorophenylamino)-5-(2,4-dihydroxyphenyl)-1,3,4-thiadiazole, with ID50 two times lower (SW707, T47D) than for cisplatin studied comparatively as the control compound.

   ![Structure 1](image1)

7. **Chen et. al. (2007)** had been reported with the synthesis of of novel hybrid molecules containing 1,3,4-oxadiazole and 1,3,4-thiadiazole bearing Schiff base moiety were designed, synthesized and evaluated for their in vitro antitumor activities against SMMC-7721, MCF-7 and A549 human tumor cell lines by CCK-8 assay.

   ![Structure 2](image2)

8. **Jason B Garriso et. al. (2007)** synthesized a series of quinazoline derivatives and they found that their lead compound effectively targets human prostrate tumour epithelial cells as well as vacular endothelial cells without inducing classic apoptosis.

9. **Mohd. Amir et. al. (2008)** have synthesized the 1, 3, 4-thiadiazole derivatives of diclofenac and showed anti-inflammatory activity from 79.04% to 82.85%. The maximum activity (82.85%) was shown by thiadiazole derivative that is compound 66 having p-fluoro phenyl amino group at second position.
10. **Mauro Mazzei et al. (2008)** reported Mannich reaction of Hydroxy coumarin, the reaction ascertained the position of substitution of active hydrogen

![Mannich reaction of Hydroxy coumarin](image)

11. **Anja Luth and Werner Lowe (2008)** synthesized a series of 4-(indole-3-yl)quinazolines and evaluated for their EGFR tyrosine kinase inhibiting activity. The synthesized compound were found to have excellent cytotoxic properties at different cell lines.

![4-(indole-3-yl)quinazolines](image)

12. **Wenfang Xu et al. (2008)** reported about the novel anticancer targets and drug discovery in post genomic age. This articles defines the advancement of cancer biochemistry and molecular pharmacology together with the aid of sequencing human genome, with the combination of chemoinformatics. Thus the strategy of new anticancer drugs design targeting to novel biological macromolecules associated with cancer will be an overwhelming victory.

13. **Gauri Shukla et al. (2008)** synthesized a series of benzothiazoloquinazolones and studied their effect on epidermal growth factor receptor. Lead compounds were able to block epidermal growth factor receptor (EGFR) in human breast adenocarcinoma cell line, MCF-7.

![Benzothiazoloquinazolones](image)

14. **Yandong Zhang et al. (2008)** prepared a series of 2,3-disubstituted 8-aryl amino-3H-imidazo[4,5-g] quinazolines and evaluated for their cytotoxic activity invitro against 5 human cancer cell lines(human lung carcinoma cell line:A549,human leukemia cell lines: K562 and Molt-4,human prostrate cancer cell line:PC-3,human breast carcinoma cell lines:MDA-MB-
Most of the compounds showed potent activity against these tumour cell lines, especially against the A549 cell line.

15. **P Mani Chandrika et al. (2009)** synthesized a series of 2,4,6-trisubstituted quinazoline derivatives from anthranilic acid in five steps. The synthesized compounds showed promising results when screened for the cytotoxic and antibacterial activity.

![Chemical structure](image1)

16. **Kalam Sirisha et al. (2009)** have been studied the anticancer activity of 4-substituted-2,6-dimethyl-3,5-bis-(heteroaryl)-carbamoyl-1,4-dihydropyridines and the compound 4-Chlorophenyl at C-4 position and 2-methyl-4-oxo-3H-quinazolin-3-yl substitution at C-3 & C-5 position of 1,4-dihydropyridine have shown the equipotent activity compared to methotrexate drug against MCF-7 and HT-29 cell lines.

17. **Anne Beauchard et al. (2009)** Synthesis and antitumoral activity of novel thiazolobenzotriazole, thiazoloindolo[3,2-c]quinoline and quinolinoquinoline derivatives. All thiazolobenzotriazole intermediates were tested in vitro for their capacity to inhibit the growth of two breast cancer cell lines, MCF-7 and MDA-MB-231. In parallel, the newly synthesized skeletons were evaluated for DNA interaction, topoisomerase’s inhibition, and cytotoxicity against HL60 and HL60/MX2 human leukemia cells. Most compounds showed a potent growth inhibitory effect on all the tested cell lines, with IC50 in the mM range.

![Chemical structure](image2)

18. **Poojary et al. (2010)** had been reported with the Design, synthesis and biological evaluation of a novel series of 1,3,4-oxadiazole bearing N-methyl-4-(trifluoromethyl)phenyl pyrazole moiety as cytotoxic agents.
19. **Padmavathi et. al. (2010)** had been reported with the synthesis of 2-(Bis((5-aryl-1,3,4-oxadiazol-2-yl)methylthio)methylene)malononitriles and were evaluated for their antioxidant activity.

20. **Hai-Liang Zhu et. al. (2010)** discovered 1H-benzo[d][1,2,3] triazol-1-yl 3,4,5-trimethoxy benzoate as a potential anti proliferative agent by inhibiting histone deacetylase and the anti proliferative activity was done on human oral epidermoid carcinoma KB cells, stomach carcinoma MKN45 cells and non-small lung carcinoma H460 cells.

21. **Sevgi et. al.(2010),** were synthesized 5-[4-(4fluorobezoylolamino)phenyl]-2-subsitutedamino-1,3,4-thiadiazole and evaluate the cytotoxic activity.

22. **Salimon et. al. (2010)** introduced some new 2,5-(dithioacetic acid)-1,3,4-thidiazole and 2,5-di-[5-amino-1,3,4-thidiazole-2-thiomethyl]-1,3,4-thidiazole which were screened for their in vitro antibacterial activities against the Gram-positive (S. aureus, S. cerevisiae and C. diphtheriae) and the Gram-negative, (*E.coli* and *P.aeruginosa*) bacteria.
23. **P. Selvam et al. (2010)** Synthesis, antiviral and cytotoxicity studies of some novel N-substituted benzimidazole derivatives. New compounds were synthesised through manich reaction using sulphanilamide, sulphadimidine, sulphamethoxazole, 2-aminopyrimidine, phthalimide, anthranilic acid, 2-mercapto benzimidazole and benzamide

24. **Tirzitis G et al. (2011)** investigated that antioxidants with 1, 4-dihydropyridine structure are less harmful alternative to synthetic phenolic antioxidants in liposomes under conditions stimulating food storage.

25. **H R Tsou (2011)** synthesized a series of 6-substituted-4(3-bromophenyl amino) quinazolines as putative irreversible inhibitors of the epidermal growth factor receptor (EGFR) and human epidermal growth factor receptor (HER-2) tyrosine kinases with enhanced antitumour activity.

26. **Kun Hu (2012)** had been reported with synthesis of 4b-(1,3,4-oxadiazole-2-amino)podophyllotoxin derivatives were designed and synthesized. Their cytotoxicity in vitro against six tumor cell lines (DU-145, SGC-7901, A549, SH-SY5Y, HepG2 and HeLa) were evaluated by standard MTT assay.

27. **Shah et al. (2012)** had been reported with Synthesis of novel 1, 2, 4-oxadiazoles and analogues as potential anticancer agents.
28. Georgey *et al.* (2012) had been reported with Novel 1,3,4-heterodiazole analogues: Synthesis and in-vitro antitumor activity.

29. D.Sahin *et al.* (2012) synthesized a cyclic sulfonamide derivative containing 4-nitrophenyl sulfonyl moiety in position 2 beside a benzyl group at position 5 of the 1,2,4-triazole skeleton, was the most active against most of the test microorganisms, whereas other sulfonamides containing a methyl group instead of a benzyl group showed no activity towards the test microorganisms.

30. Gakh *et al.* (2013) had been reported with Identification of diaryl 5-amino-1,2,4-oxadiazoles as tubulin inhibitors: The special case of 3-(2-fluorophenyl)-5-(4-methoxyphenyl)amino-1,2,4-oxadiazole.

31. Aziz-ur-Rehman *et al.* (2013) had been reported with Synthesis of new N-(5-chloro-2-methoxyphenyl)-4-(5-substituted-1,3,4-oxadiazol-2-ylthio)butanamide derivatives as suitable lipoxygenase inhibitors.

32. Shafiee *et al.* (2014) had been reported with One-pot, four-component synthesis of novel cytotoxic agents 1-(5-aryl-1,3,4-oxadiazol-2-yl)-1-(1H-pyrrol-2-yl)methanamines.
33. **Salahuddin et. al. (2014)** had been reported with the Synthesis, characterization and anticancer evaluation of 2- (naphthalen-1-ylmethyl/naphthalen-2-yloxymethyl)-1-[5- (substitutedphenyl)-[1,3,4]oxadiazol-2-ylmethyl]-1H-benzimidazole.

34. **Kaur et. al. (2014)** synthesized a series of new 5-substituted 2-(2,4-dihydroxyphenyl)-1,3,4- thiadiazoles and evaluated for their antiproliferative activity against the cells of human cancer lines. They exhibited higher inhibitory activity against T47D cells (human breast cancer cells) than cisplatin.

35. **Prabhat K Upadhyay et. al. (2015)** reported the synthesis of bioactive compounds containing oxadiazole and thiadiazole and characterization using ir, nmr, and mass spectroscopic methods.