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Department: Chemistry

Topic: “Synthesis, Characterization, Anticancer activities of Heterocyclic Molecules
Encapsulated in Nanocarriers”

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My thesis titled “ **Synthesis, Characterization, Anticancer activities of Heterocyclic Molecules Encapsulated in Nanocarriers**” itself depicts that it is about synthesis of novel heterocyclic molecules with their characterization and their detection of anticancer activity both naked as well as in combo with nanocarriers. The main purpose of my thesis is to synthesize new and various heterocyclic molecules to add one more step forward for the treatment of deadly disease cancer. As we already know, it is spreading like a fire in world. Apart from that scientists are thinking out of box by using nanocarrier as their carrier of anticancer drugs. Nanocarrier has brought huge breakthrough in medicine as they can pass through blood vessel easily and reach the damaged part without effecting healthy tissue and cells. So, i utilized the same idea in my thesis. I took a particular set of nanocarriers like polymeric nanocarriers and 5.0 G dendrimer for my work.

With the help of many techniques like FT-IR, UV-Vis, NMR, MS, SEM, Docking studies and most important Invitro anticancer assay. Apart from these techniques, many websites were visited by me frequently like sci-finder, scopes, google scholar to get sufficient material for my research. Human cancer cells like HEK, SN 480, MCF-7, HEPG2(C3A) were used during my research. Also calf thymus DNA was utilized to get DNA binding activity. All these techniques were used to get information required for my Ph.D.

Three series of heterocyclic were synthesized by different reaction procedures like Indole, carbothioamide and thiazole series. Also, nanocarriers like polymeric nanocarriers and 5.0 G dendrimers were also synthesized in lab. The result was overall good. Many synthesized compounds showed good invitro result against different human cancer cells. Their encapsulated form in nanocarriers also showed good invitro result against human cancer cells. Also, their binding with DNA and in silico study were effective and supported my anticancer assay data.

Further, these molecules can go through in vivo anticancer activity i.e; inside the living organism for the better treatment of cancer. Also, other different types of nanocarriers can be used like liposomes, carbon nanotubes etc to have an enhancement of this Ph.D. work.