Plant compounds play an important role in human medicine. They are a source of new drugs or serve as an inspiration for drugs' development.

This thesis presents a study about syntheses of derivatives and biological activities of two groups of natural products, quinones and terpenoids. Terpenoids are plant secondary metabolites which are known for their antimicrobial, anti-inflammatory and anti-tumoral activities. We have focused on two representatives, paclitaxel and carvacrol. GnRH-paclitaxel anti-tumor conjugates potentially suitable for targeted delivery to cancer cells were prepared. Their antiproliferative activities *in vitro* were evaluated on MCF-7 cancer cell line and cytotoxicity in rat hepatocytes. Carvacrol and its derivative were tested for its possible anti-inflammatory effect, which was assessed *in vitro* as their potential to inhibit prostaglandin E_2 biosynthesis *via* cyclooxygenase pathway.

Quinones, other targets of the thesis, are well-known for biological activities similar to terpenoids. Thymoquinone, juglone and their derivatives were tested *in vitro* as inhibitors of cyclooxygenases and 5-lipoxygenase. Derivatives of juglone were prepared to help us to suggest structure-activity relationship of this compound. Thymoquinone and its derivatives were evaluated for their antioxidant capacity by DPPH and ORAC assays as their potential to scavenge radicals.