



University of Zabol

Graduate school

Faculty of Agriculture

Department of Plant Breeding and Biotechnology

**The Thesis Submitted for the Degree of PhD (in the field of
Biotechnology)**

**Screening of medicinal plants in the
treatment of innate immunity failures
in gastrointestinal cancers : Insights
from transcriptome analysis, virtual
screening and cell culture**

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Abstract

One of the most common and most critical mortality causes in modern society is Gastrointestinal (GI) cancer. Inflammation and infections are contributing factors to gastrointestinal cancers. While resistance to antibiotics is one of the most important problems of the 21st century. Medicinal plants are very rich in photochemicals that can be structurally optimized and converted into new drugs. For this purpose, 200 samples of SRR thighs related to Gastrointestinal Cancer tissue were downloaded from the database along with its control, including healthy confirmed tissues in pathology or negative control samples of the same tissue. Downloaded by SRA-toolkit software in Windows environment from NCBI server. The data were cleaned and trimmed for the presence of adapters and other sequencing elements (identification of these elements was done using Fast QC (Quality Control) software). Map Read to Reference analysis was performed by CLC genomics 21 software package. Mapping parameters were set based on human genome reference (Ensemble.org) based on software default. Analysis was performed for DGE test in two groups: Cancerous and Ctrl. P Values smaller than one percent, absolute magnitudes and fold changes greater than two were considered significant increases or decreases. Therefore, 28,000 genes, especially 95 key genes of the innate immune system from this region were examined. In the next step, several important genes in the inflammatory pathway were examined to determine the target for anti-inflammatory drugs from the TCM database. The nettle plant was selected from the medicinal plants that were obtained in the first stage of the experiment in the analysis of transcriptome and the analysis of their active ingredients as Toll Like Receptors inhibitors, and after hydroalcoholic extraction of the plant, its effects on adenocarcinoma cell line Stomach (AGS) was examined in cell tissue culture medium. Also, in human peripheral blood mononuclear cell culture, MTT, Real Time PCR and flow cytometry (Annexin PI) tests were performed. So, the anti-inflammatory and inhibitory properties of nettle active ingredients in the considered cell lines were investigated.

Keywords: Database, Cancer, high-throughput virtual screening, Key Receptors, Software