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**NETWORK PHARMACOLOGY STUDY OF IDENTIFIED
FORMONONETIN COMPOUND THROUGH MOLECULAR
DOCKING STUDY AGAINST OSTEOSARCOMA**

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ABSTRACT

An osteosarcoma (OS) or osteogenic sarcoma (OGS) (or simply bone cancer) is a cancerous tumor in a bone. Specifically, it is an aggressive malignant neoplasm that arises from primitive transformed cells of mesenchymal origin (and thus a sarcoma) and that exhibits osteoblastic differentiation and produces malignant osteoid. *Trifolium pratense* is an erect biennial or perennial important villous forage herb. Traditionally, it is used to treat psoriasis, eczema, gout, cancer, sedative, hard swelling. Different extracts from red clover (*trifolium pratense* L.) were tested for their ability to stimulate the activity of osteoblastic osteosarcoma cells. As a key marker of osteoblasticity we chose the activity of alkaline phosphatase (ALP) or cellular protein production, enzyme activity was increased significant on incubation with chloroform extracts. The Formononetin was selected for the further study on the basis of literature, as it is fights progression of cancer via inducing apoptosis, arresting cell cycle, and halting metastasis via targeting various pathways which are generally modulated in several cancers. Then selected the reports targets e.g., CHEK2, TP53, RB1, VEGFA, EGFR, RUNX2, MDM2, MMP2, MET, DHFR, TNFRSF11A, JUN and RFC1 from the literature. After understanding networking, the result suggests that five target key {EGF (epidermal growth factor), STAT3 (signal transducer and activator of transcription 3), TP53 (tumor protein p53), CHEK2(checkpoint kinase 2) and VEGFA (vascular endothelial growth factor A)} protein of osteosarcoma which are directly related with tumor suppressor cells. The docked proteins with Formononetin ligand showed that CHEK2 (Checkpoint kinase 2) is a tumor suppressor gene that encodes the protein CHK2, a serine-threonine kinase that acts tumor suppressor.

Keywords: *Osteosarcoma, Formononetin, Cancer, Bone Cancer, CHEK2, Trifolium Patense*