TITLE

IN-SILICO SELECTION OF NATURAL ANTI-LEUKAEMIA COMPOUNDS

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Analysis of 13 natural compounds such as Transresveratrol, Honokiol, Chrysin ,Limonene, Cholecalciferol , Cerulenin, Aloe emodin and Salicin revealed many interesting facts, some of them are novel. Target profiling by Ontomine, Docking and Gene Expression Network analysis indicates these compounds targets protein which are important target for cancer treatment. Pathways analysis indicates statistically over-representation of cancer related pathways among drug targets for Aloe emodin, Cerulenin, Chrysin, Honokiol, Mevinolin, Resveratrol. Improvement in combination score can be observed for natural compounds as we move from singlet to combinations, which could be attributed to drug synergism due to increase in relevant targets, improved specificity of drug constituents. This increase in Combiscore is not just because of random effects like pooling of result of individual drugs etc, since we have accounted for important factor for drug combinations like target relevance to cancer/AML, specificity, common targets among drug constituents etc while calculating scores used for ranking drug combination. We have also performed parallel analysis on benchmarking drugs which exist in market for AML treatment, and results of analysis are supported by various studies/ publications. Combination analysis on benchmarking drugs was successful in discovering well known combinations like Amonafide + Cytarabine, Daunorubicin + Prednisone among top drug combination in our analysis. Aloe emodin + Mevinolin + Honokiol selected as best combination in our analysis has interesting profile with respect to drug specificity, targeting AML related proteins, targeting hubs (proteins with high connectivity in interaction network). Similarly, other potential combinations have good target profile.