

Role of curcumin in wound healing: A systems biology approach



Abstract

Curcumin, a polyphenolic compound present in turmeric plant (*curcuma longa*) is well known for its anti-aging, antitumor, anti-inflammatory, anti-mutagenic and antioxidative properties due to which turmeric has been used as a medicinal plant from ages. All these properties also make it an efficient medicine for wound healing. The process of wound healing comprises of four overlapping phases which are governed by several genes like interleukins, TNFs, chemokines etc. Our current study aims at finding the most potent targets of curcumin displaying efficient binding by using various systems biology tools. Around 560 genes related with wound healing are extracted from pubmed using the combination of words like wound healing, curcumin, *Homo sapiens* etc. For the investigation of the mechanism of curcumin interference at the system level, protein-protein interaction network (PPIN) of the proteins involved in wound healing process was generated using STRING database. In this study we also aim at finding some non-reported and novel genes that are involved in wound healing and can act as potential targets of curcumin. For this purpose, connectors were incorporated with high degree confidence of 0.009. The PPIN generated had 656 nodes and 4478 edges with an average local clustering coefficient of 0.473. The noise of the data generated in PPIN was removed by doing modulation of the network with the help of Molecular Complex Detection (MCODE) and finding the seed proteins. With MCODE 18 modules got generated having 206 seed proteins. Gene Ontology (GO) enrichment analysis along with network topology analysis and molecular docking will help in pinpointing the most important and efficient curcumin binding proteins.

Uma Bhardwaj

Swami Rama Himalayan University, India

Biography

Uma Bhardwaj, Dean Research at SRHU, has previously served as Vice-Chancellor, Maharaj Vinayak Global University (MVGU), Jaipur. During her tenure as Vice-Chancellor, she was awarded with the 3rd CMAI CCI Technology Education Excellence Award, July 2016 and honoured by the High Commissioners and Ambassadors of eight Countries. She was honoured by Bharat Jyoti Award 2018 and Best Citizen of India Award 2019. Her current research interest is in "Molecular mechanism of curcumin using Systems Biology", and she has to her credit many peer reviewed research publications. Dr. Bhardwaj owns Patents and has developed some Commercial Products for Industries. She is currently acting as Chief Editor of Scientific Journals, and holds membership of many national and international Journals. She has many international books on Biochemistry from Pearson Publication.



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