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Treatment of kidney disorders through interaction on nuclear factor kappa B, xanthine oxidase and soluble epoxide hydrolase: Medicinal importance and physiological functions of Visnagin through In-vivo and molecular simulation study

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Objectives: Visnagin is a 'furanochromone derivative' which is the main active constituent's of Ammi visnaga treats ureter and bile duct, gall bladder and renal colic. Nephrotoxicity is one of the common most complications during all the types of treatment in cancer patients.

Methods: In order to determine the biological importance of visnagin for the treatment of kidney disorders, present work summarizes data's analysis of scientific work visnagin in order to treat kidney disorders. However other important pharmacological activities have been also summarizes to make better understanding to treat kidney disorders. Present study point out the importance of visnagin for the treatment of kidney disorders, however data analysis of the presented data of various scientific work have been also carried out to make better correlation through different in-vitro and in-vivo experiments. Molecular simulation and dynamic study were carried out with visnagin against nuclear factor kappa B, xanthine oxidase and soluble epoxide hydrolase. Effect of visnagin through oxidative stress in kidney was also analyzed and co-related for the development of molecule against kidney disorders.

Results: Data analysis of the scientific work revealed the importance of visnagin for the prevention of crystal deposition in the kidneys of rats which further signified their beneficial effect for the kidney disorder treatment. Effect of visnagin on kidney cell injury was also found to be significant and play important role in the prevention of stone formation. Molecular simulation study showed better intraction with nuclear factor kappa B, xanthine oxidase and soluble epoxide hydrolase as binding energy of visnagin with all the ligands was found to be minimum and negative. Molecular docking study supports the *in-vivo* and *in-vitro* data to make better molecular mechanism for their effectiveness against kidney disorders.

Conclusions: The presented information will be beneficial for the development of alternative tools to treat kidney disorders.