

Screening and characterization of molecules from *Withania somnifera* for neurological disorders

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Neurodegenerative disorders have great social impact and are important factors determining the maximum healthy age and the mortality in the modern times. Some of the well known neurological disorders are Parkinson's, Alzheimer's, Huntington's, amyotrophic lateral sclerosis and Creutzfeldt-Jakob's. According to the World Health Organization (WHO), the UN's health agency, mental and neurological disorders ranging from depression to Alzheimer's currently strike 400 million people globally and are set to surge in the next two decades. Non-availability of drugs for the prophylaxis and treatment of these disorders throws a challenge for the researchers. The abundant natural molecules of plant origin and their modification has yielded not only the new lead molecules for drug discovery and development but also the nutraceuticals. Historically, *Withania somnifera* commonly known as Ashwagandha is being used as neurotonic for anxiety and neurological disorders. In the present study, we have created library of withanolides (in-house, database and virtual) for carrying out docking studies with the target proteins involved in neurodegeneration. The virtual library consists of molecules with functional groups interchanged based on Lipinski's Rule of Five. Further the molecules would be subjected to docking studies with varied parameters to come out with drug molecules with better pharmacokinetics and Pharmacodynamics properties.

On the other hand, in-vitro culture conditions were optimized for both direct and indirect organogenesis from nodal explants of *Withania somnifera*. The methanolic extract prepared from the roots of these plantlets were subjected to HPLC for detection of compounds. These purified natural molecules will be exposed to Hek cell lines expressing mutant proteins responsible for neurodegeneration.

Development and evaluation of fast dissolving films containing ondansetron hydrochloride

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The present study was aimed to formulate and evaluate fast dissolving films of Ondansetron hydrochloride (OH) using hydroxypropylmethyl cellulose. OH-5HT₃-antagonist which is very effective antiemetic used in both chemotherapy and radiotherapy induced emesis. Hydroxypropylmethyl cellulose, a polymer used as film forming agent. Fast dissolving films are meant to be dissolved in saliva and remain in oral cavity until swallowed. Hence taste masking becomes critically important to obtain maximal patient acceptability. The complexes prepared by precipitation method and characterized by UV, FTIR, X-ray diffraction spectroscopy, diffusion study, interfacial partition study and invitro taste evaluation study. The suitable plasticizer and its concentration was selected on the basis of flexibility, tensile strength and stickiness of the film. In the present study propylene glycol was used as plasticizer. Films were evaluated for drug content and the drug loading capacity was found to be 90.77 per 2cm². The dissolution profile, disintegrating time and folding endurance were found to be satisfactory. Thermal stability of the film and drug-excipient interactions was investigated by DSC and FT-IR. Results showed that there is no interaction between drug and excipients used. Further, the optimized films were evaluated in human volunteers (after ethical committee permission) for invivo disintegration time and taste evaluation. It was found that the films disintegrate within 1min and no bitter taste was noted. Hence it is concluded that OH hydroxypropylmethyl cellulose fast dissolving films are successfully developed and evaluated.