# Structure-Activity Relationships in FF Neuropeptide

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Abstract

Neuropeptide FF (NPFF) is a neurotransmitter involved in the intricate modulation of pain and opiate tolerance in mammals, via its G protein-coupled receptors, NPFF1 and NPFF2. To date, little information has been obtained as to the exact functions of NPFF receptors and the specific receptor-peptide interactions. Parallel tempering (replica-exchange) molecular dynamics (REMD) methodology is applied to FF neuropeptide and its most dominant conformational states are predicted after hydrogen bonding, NMR and clustering analyses. Calculations were carried out for both implicit and explicit solvent models and for different FF variants, in order to monitor the most probable conformations for the peptide, as well as any interactions between FF and the receptors. Our results provide important insight into the diverse pharmacological functions of neuropeptide FF.