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Interaction of Phytochemicals Present in Green Tea, Honey and Cinnamon to Human Melanocortin 4 Receptor

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Abstract : Human Melanocortin 4 Receptor (HMC4R) is one of the most potential drug targets for the treatment of obesity which controls the appetite. A deletion of the residues 88-92 in HMC4R is sometimes the cause of severe obesity in the humans. In this study, two homology models are constructed for the normal as well as mutated HMC4Rs and some phytochemicals present in Green Tea, Honey and Cinnamon have been docked to them to study their differential binding to the normal and mutated HMC4R as compared to the natural agonist α- MSH. Two homology models have been constructed for the normal as well as mutated HMC4Rs using the Modeller9v7. Some of the phytochemicals present in Green Tea, Honey, and Cinnamon, which have appetite suppressant activities are constructed, minimized and docked to these normal and mutated HMC4R models using ArgusLab 4.0.1. The mode of binding of the phytochemicals with the Normal and Mutated HMC4Rs have been compared. Further, the mode of binding of these phytochemicals with that of the natural agonist α- Melanocyte Stimulating Hormone(α-MSH) to both normal and mutated HMC4Rs have also been studied. It is observed that the phytochemicals Kaempherol, Epigallocatechin-3-gallate (EGCG) present in Green Tea and Honey, Isorhamnetin, Chlorogenic acid, Chrysin, Galangin, Pinocambrin present in Honey, Cinnamaldehyde, Cinnamyl acetate and Cinnamyl alcohol present in Cinnamon have capacity to form more stable complexes with the Mutated HMC4R as compared to α- MSH. So they may be potential agonists of HMC4R to suppress the appetite.

Keywords : HMC4R, α-MSH, docking, photochemical, appetite suppressant, homology modelling
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