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In vitro and in silico drug-food interaction: An evaluation of metformin and green tea interactions**Jacob Adegboyega Kolawole¹, Olanike C Kolawole² and Obiwevbi O Daniel¹**¹University of Jos, Nigeria²Kaduna State University, Nigeria

Food-drug interaction is a consequence of physical, chemical or physiological relationship between a drug and food. Failure to identify and properly manage food-drug interaction can lead to serious consequences such as reduction in absorption of certain orally administered drugs thereby leading to failure of treatments. This study was aimed to explore the effect of green tea on Metformin uses both in vitro dissolution test and in silico docking interactions models. Dissolution test was carried out on Metformin alone and Metformin in the presence of green tea using the official dissolution medium, phosphate buffer pH 6.8 and sampling done at USP timing intervals. Docking studies was carried out by using 10 phenolic compounds and Metformin in the active site of the AMPK crystal structure, 4ZHX. Metformin alone complied with the USP requirement of 70% drug release while Metformin release in the presence of green tea was less than 70% at 45 minutes. Phenolic constituents of green tea (-)-epigallocatechin, epicatechin, theanine and theophylline were seen to form complexes with Metformin through covalent bonding in the active site of AMPK. This study was able to establish the interaction of green tea on Metformin dissolution profile and possible binding interactions in the binding site of AMPK enzyme. It was therefore concluded that the presence of green tea in the dissolution media along with Metformin caused a decrease in its dissolution profile due to complex formation and that the catechins and theanine constituents of green tea could possibly compete for binding site residues with metformin.

kolajac@yahoo.com

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