Drug-drug and drug-food interactions of cytochrome P4503A4

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The adverse effects of drug-drug interactions are costly both in terms of human life and investment (withdrawal of drugs from the market). Inhibition of CYP-mediated (cytochrome P450) drug metabolism by a concomitantly administered second drug is one of the major causes of drug–drug interactions in humans and can lead to serious adverse reactions or toxic side effects. Although less publicised, drug-food interactions can also cause an increase or decrease in the oral drug bioavailability when co-administered, the most well known case being that of grapefruit juice and the short-acting calcium channel blocker, nifedipine.

One major limitation of these types of studies is the lack of fast and reliable tests for measuring such phenomena. Here we report the first *in vitro* characterisation of drug-drug and drug-food interactions of CYP enzymes using an electrochemical platform devised in our group. The use of *in vitro* data to predict the CYP inhibition by a co-administered drug/food is attractive because of the rapid and simple experimental procedures involved. In terms of drug-drug and drug-food interactions, data will be presented on CYP3A4 inhibition by both strong and weak inhibitors of this enzyme; ketoconazole (anti-fungal), cimetidine (histamine H_2-receptor antagonist), grapefruit juice, curcumin (curry spice turmeric) and resveratrol (red wine).