*Camellia sinensis* (black tea) inhibits cytochrome P450 1A1 in 3-methylcholanthrene-induced rat hepatic microsomes

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1. Black tea polyphenols (theaflavins) have a variety of health-promoting actions including anti-carcinogenic effects. These actions are thought to be elicited through inhibitory effects on cytochrome P450 1A1 (CYP1A1), an enzyme induced by procarcinogenic hydrocarbons which are then later activated by it.
2. The present study evaluated the potency and mechanism of black tea inhibition of 3-methylcholanthrene-induced CYP1A1 activity in rat liver microsomes.
3. Kinetic fluorimetric assays of ethoxyresorufin O-deethylation were used to estimate CYP1A1 activity. The enzyme had a $K_m$ of 1.2 µM and a $V_{max}$ of 1.7 pmol mg$^{-1}$ min$^{-1}$.
4. All black teas tested inhibited CYP1A1 activity with $IC_{50}$s (µg/mL) as follows: Orange Pekoe, 1.8; Orange Pekoe Decaf, 2.3; Earl Grey, 4; English Breakfast, 1.2. The teas contained similar amounts of polyphenols.
5. The inhibitory action of the teas decreased with increased preincubation times with CYP1A1 before substrate addition. This suggests that the teas were acting as substrates for CYP1A1.
6. These findings are the first known evidence suggesting that black tea is able to inhibit rat liver CYP1A1 activity by acting directly on the enzyme. These data support the hypothesis that black tea has potential as an anti-cancer agent.