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Dietary Phytochemicals as Inhibitors of Primary Amine Oxidase

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1 Dietary phytochemicals as inhibitors of primary amine oxidase

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6 Phytochemicals such as methylxanthines, catechins and polyphenols show health benefits in a range
7 of diseases although their mechanism of action is not fully understood. Primary Amine Oxidase
8 (PrAO) is widely recognised as a therapeutic drug target for the treatment of inflammatory, vascular
9 and neurodegenerative diseases. Previous work in our laboratories showed that caffeine inhibited
10 bovine PrAO activity with a K_i of 1.0mM. In the present study we examined a range of
11 methylxanthines and catechins as inhibitors of bovine PrAO. The methylxanthines tested were
12 caffeine, paraxanthine, theophylline, theobromine and 7-methylxanthine. Of these, only
13 theobromine was an inhibitor with an IC_{50} of *ca.* 300 μ M. Calculations indicated that theobromine
14 in foods could inhibit PrAO activity by 20%. The effect of dietary catechins; epicatechin, epicatechin
15 gallate and epigallocatechingallate was even more significant with IC_{50} values in the micromolar
16 region. However, inhibition by catechins was complicated by apparent activation of PrAO at high
17 concentrations although this was not significant at physiologically attainable levels. Nonetheless,
18 these findings indicate that a range of dietary phytochemicals could affect PrAO activity *in vivo*. We
19 suggest that the health benefits associated with consumption of certain phytochemicals may be
20 attributed to PrAO inhibition.

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