Dokumenttyp: Zeitschriftenaufsatz


Titel des Beitrags: Identification of coffee components that stimulate dopamine release from pheochromocytoma cells (PC-12)

Abstract: Coffee and caffeine are known to affect the limbic system, but data on the influence of coffee and coffee constituents on neurotransmitter release is limited. We investigated dopamine release and Ca(2+)-mobilization in pheochromocytoma cells (PC-12 cells) after stimulation with two lyophilized coffee beverages prepared from either Coffea arabica (AR) or Coffea canephora var. robusta (RB) beans and constituents thereof. Both coffee lyophilizates showed effects in dilutions between 1:100 and 1:10,000. To identify the active coffee compound, coffee constituents were tested in beverage and plasma representative concentrations. Caffeine, trigonelline, N-methylpyridinium, chlorogenic acid, catechol, pyrogallol and 5-hydroxytryptamides increased calcium signaling and dopamine release, although with different efficacies. While N-methylpyridinium stimulated the Ca(2+)-mobilization most potently (EC(200): 0.14 +/- 0.29μM), treatment of the cells with pyrogallol (EC(200): 48 +/- 14nM) or 5-hydroxytryptamides (EC(200): 10 +/- 3nM) lead to the most pronounced effect on dopamine release. In contrast, no effect was seen for the reconstituted biomimetic mixture. We therefore conclude that each of the coffee constituents tested stimulated the dopamine release in PC-12 cells. Since no effect was found for their biomimetic mixture, we
hypothesize other coffee constituents being responsible for the dopamine release demonstrated for AR and RB coffee brews.

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