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Titel des Beitrags: Multi-parametric approach to identify coffee components that regulate mechanisms of gastric acid secretion

Abstract:
SCOPE: Chlorogenic acid (CA), caffeine (CAFF), pyrogallol (PYR), catechol (CAT), (beta)N-alkanoyl-hydroxytryptamides (C5HT) and N-methylpyridinium (N-MP) were evaluated for their influence on mechanisms of gastric acid secretion as single compounds and in biomimetic mixtures.

METHODS AND RESULTS: Compounds were tested in coffee representative concentrations. Human gastric cancer cells (HGT-1) were used to study the proton secretory activity by Ussing chamber experiments and FACS analysis. For activation of EGFr, Akt1, ERK1/2, ATF-2 and cAMP levels, we performed pathway screening assays. Time-dependent expression of related genes were determined by real-time PCR. Part of the data was used for neural network modeling to identify the most relevant compounds. N-MP increased the expression of the anti-secretory somatostatin receptor by 114 %, whereas C5HT decreased its expression by 52 %. N-MP down-regulated the pro-secretory CHRM3 receptor by 36 % and the H(+)K(+-)ATPase by 36 %. CAFF stimulated the secretory activity in the functional assays, whereas N-MP and CA decreased proton secretion. After applying a pathway analysis, we were able to discriminate between CAFF, CA, CAT, C5HT, PYR and histamine-activating EGFr signaling.
and N-MP-associated ERK1/2 signaling. CONCLUSION: By applying a multi-parametric approach, N-MP was shown to effectively down-regulate mechanisms of gastric acid secretion in human parietal gastric cells.