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Titel des Beitrags: Antiadhesion as a functional concept for prevention of pathogens: N-Phenylpropenoyl-L-amino acid amides as inhibitors of the Helicobacter pylori BabA outer membrane protein

Abstract: SCOPE: Besides flavan-3-ols, a family of N-phenylpropenoyl-L-amino acids (NPAs) has been recently identified as polyphenol/amino acid conjugates in the seeds of Theobroma cacao as well as in a variety of herbal drugs. NPAs were shown to exhibit antiadhesive activities against Helicobacter pylori. METHODS AND RESULTS: For structure/activity relationship 24 homologous NPAs (2 mM) were investigated in a flow cytometric assay on potential antiadhesive effects against H. pylori adhesion to human gastric AGS cells. Dihydroxylation of the aromatic molecule part was shown to be necessary for activity; methoxylation decreases activity. High polarity of the amino acid is a prerequisite for activity. The model compound N-(E)-caffeoyl-L-glutamic acid 11 exerted a concentration-dependent inhibition of bacterial adhesion with saturation at 30(%) inhibition level. The antiadhesive effect was additionally confirmed by in situ adhesion assay on intact human gastric tissue. NPAs exhibited no cytotoxicity. Using immobilized ligands interaction 11 with bacterial adhesin BabA was demonstrated. RT-PCR indicated that the inhibition of BabA is not correlated with subsequent feed back regulations to express more adhesins or virulence
factors (vacA, cagA, cagL, cagalpha, fucT, ureL, ureA, OMPs). The interaction of bacterial adhesins with the respective ligands does not automatically lead to a subsequent signal transduction towards induction of virulence processes. CONCLUSION: The nutritional use of NPA-containing food may justify a positive antiadhesive effect against the recurrence of H. pylori infections.