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Bitterness Evaluation of H_1-Receptor Antagonists Using a Taste Sensor

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The objective of this study was to evaluate an improved bitterness sensor, which, it is postulated, will allow a more precise and sensitive prediction of the bitterness of active pharmaceutical substances. The bitterness sensor, BT0, has a membrane surface with improved and optimized hydrophobicity, and was developed to enhance the hydrophobic interaction between the membrane and basic bitter substances. The bitterness of eight H_1-receptor antagonists was measured using a multichannel taste-sensing system incorporating sensor BT0. Three variables, relative value (*R*), change in membrane potential caused by adsorption (*CPA*) and adsorption ability (*CPA*/*R*), were used in the evaluation. For sample solutions of the eight H_1-receptor antagonists, higher sensor output values of *R* and *CPA* were observed with sensor BT0, in comparison with a conventional bitterness sensor, AN0. The higher output values seem to be due to the superior hydrophobic interactions between the BT0 sensor membrane and basic bitter substances, as sensor BT0 also showed higher *CPA/R* values. The data suggest that sensor BT0 provides a more sensitive bitterness evaluation, being able to detect bitterness in sample solution concentrations as low as 0.01 mg/ml. The eight H_1-receptor antagonists could be categorized into three groups by principal component analysis using data from sensor BT0. Sensor output from sensor BT0 could be used to discriminate effectively between drugs without the need for performing laborious gustatory sensation tests.

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