

## **2739 Prediction of Oral Malodor with Volatile Markers in the Breath**

*M. PHILLIPS\*1, R.N. CATANEO1, J. GREENBERG1, M.I. MUNAWAR1, and S. NACHNANI2, 1 Menssana Research, Inc, Fort Lee, NJ, NJ, USA, 2 University Health Resources, Inc, Culver City, CA, USA*

Purpose of study was to assay VOCs in oral breath and evaluate them as predictors of the perception of oral malodor. 2 trained organoleptic judges independently scored malodor in 69 subject on scale 0-5. Subjects provided 300 ml oral cavity breath into an inflatable bag. VOCs in 75 ml breath were captured on a sorbent trap and assayed by automated thermal desorption with gas chromatography and mass spectroscopy, and identified from a computer-based library of mass spectra. Breath VOCs were ranked by multiple t-tests comparing their abundance in high or low oral malodor groups (mean organoleptic score above or below 2.5 respectively). Subjects were randomized to a training set (46) or a prediction set (23). In the training set, forward stepwise linear regression was employed to correlate breath VOCs with the organoleptic score. The resulting model was tested in the prediction set. In the training set, 44 VOCs correlated completely with organoleptic scores ( $r=1.0$ ), and this model predicted organoleptic scores in the prediction set ( $r=0.41$ ). The predominant breath VOCs in the model were alkanes and methylated alkanes i.e. products of lipid peroxidation mediated by oxidative stress. A preliminary mathematical model employing breath VOCs partially predicted the intensity of the subjective perception of oral malodor. This predictive model could potentially be improved by incorporating additional data from a larger number of subjects. The breath VOCs most significantly associated with oral malodor were products of oxidative stress and may have resulted from infections in the oral cavity e.g. periodontitis.

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