European Respiratory Society
Annual Congress 2012

Abstract Number: 3260
Publication Number: 4307

Abstract Group: 5.2. Monitoring Airway Disease
Keyword 1: Biomarkers **Keyword 2:** Asthma - mechanism **Keyword 3:** Functional genomics

Title: Calibration of a (semi)-automatic measurement and control platform for centralized, simultaneous electronic nose (eNose) analyses in multi-centre trials

Paul 18218 Brinkman p.brinkman@amc.uva.nl [1], Marc 18219 van der Schee m.p.vanderschee@amc.uva.nl [1], Niki 18220 Fens n.fens@amc.uva.nl [1], Giorgio 18221 Pennazza g.pennazza@unicampus.it [2], Marco 18222 Santonico santonico@ing.uniroma2.it [3], Arnaldo 18232 D'Amico damico@eln.uniroma2.it [3], Frans 18233 De Jongh f.h.dejongh@amc.uva.nl [4], Peter J. 18234 Sterk p.j.sterk@amc.uva.nl [1] and 18236 U-BIOPRED Study p.j.sterk@amc.uva.nl . [1] Department of Respiratory Medicine, Academic Medical Centre, University of Amsterdam, Netherlands ; [2] Center for Integrated Research – CIR, Unit of Electronics for Sensor Systems, University Campus Bio-Medico di Roma, Italy ; [3] Department of Electronic Engineering, University of Rome “Tor Vergata”, Rome, Italy and [4] Department of Neonatology, Academic Medical Centre, University of Amsterdam, Netherlands .

Body: Rationale: Breath analysis by electronic nose (eNose) technology represents a promising diagnostic tool in lung disease. A critical step in making this technology suitable for multi-centre trials, such as the U-BIOPRED Study, is to facilitate centralized measurements on multiple eNoses simultaneously. This can be accomplished with a (semi)-automatic measurement and control platform. Aim: To calibrate and analyze repeatability of multiple sensors in an eNose platform (5 eNoses, 4 brands). Methods: Ethanol was chosen as one of the calibration gases. Different concentrations (500 ppb-8 ppm) were generated by a permeation system. Measurements at all concentrations were done in duplicate. Total number of sensors in the platform was 81. The obtained data were processed by averaging duplicate measurements after normalisation (scale 0-1). Results: The platform (not all individual sensors) was sensitive to ethanol at used concentrations (fig). The difference in normalized sensor deflections between duplicate measurements at 2 ppm was (mean[SD], range): 0.09 [0.1], 0.55-0.0004.

Conclusion: The eNose platform is capable of detecting ethanol at concentrations from 500 ppb to 8 ppm level with acceptable repeatability. Implication: This method of platform calibration with standard gases is feasible and mandatory for quality control of eNose assessments in a multi-centre setting.