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Title: An alternative sampling support for collection of particles in exhaled air

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Body: We have previously reported a method to collect material from the airways in the form of exhaled particles (PEX)¹. In the original set-up, PEX were sampled on silicon wafers to fulfill the conditions for downstream TOF SIMS analysis. Application of analytical techniques, such as immunoassay or LC-MS, involves extraction of material from the sampling support. PEX extraction from silicon wafers requires large volumes and generates unwanted silica debris. The aim of this study was to identify PEX sampling supports suitable for use of wet chemistry on the collected material. Five individuals exhaled 60L onto different sample supports. All sample supports were commercially available filters (Millipore). Samples were extracted in 200 µl of PBS/0.13%TWEEN and analyzed using albumin ELISA. Lipid was extracted using chloroform/methanol/water, 3:6:2 v/v/v, and analyzed by MALDI TOFMS. The six tested sample supports were: (1) LCR Membrane; (2) glass fiber; (3) mixed cellulose membrane; (4) Omnipore Membrane; (5) Durapore Membrane; (6) Isopore Membrane. Silica wafers were included for comparison. The extraction efficiency was evaluated based on the albumin amount extracted from the filters. The best results were obtained for Filter1, which gave the highest amount of albumin/PEX, w/w. The filter showed good linearity for observed albumin recovery as function of PEX mass, R²=0.98. The suitability of the filter for lipid analysis was confirmed by MALDI TOFMS of dipalmitoylphosphatidylcholine. We conclude that hydrophilic LCR Membrane is a good solid support for sampling PEX, suitable for collection of samples when wet chemistry is involved in the followup analysis. 1. Almstrand, et al., Anal. Chem., 2009. 81: 662.