

## Supplementary Data

### **Methodological considerations for large-scale breath analysis studies: lessons from the U-BIOPRED severe asthma project.**

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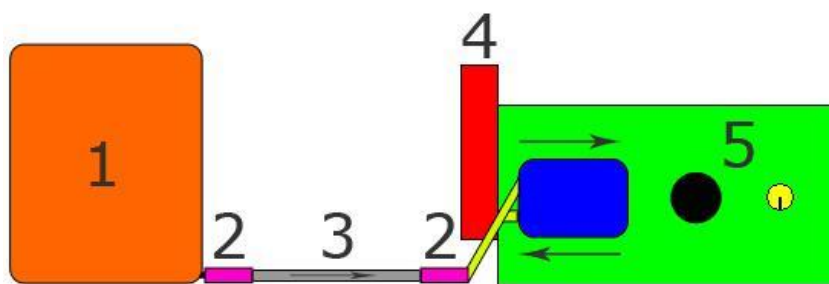


Figure S1. A diagram of the sampling method illustrating the position of the 1) Tedlar bag, 2) connectors, 3) sample tube, 4) flow indicator, and 5) peristaltic pump.

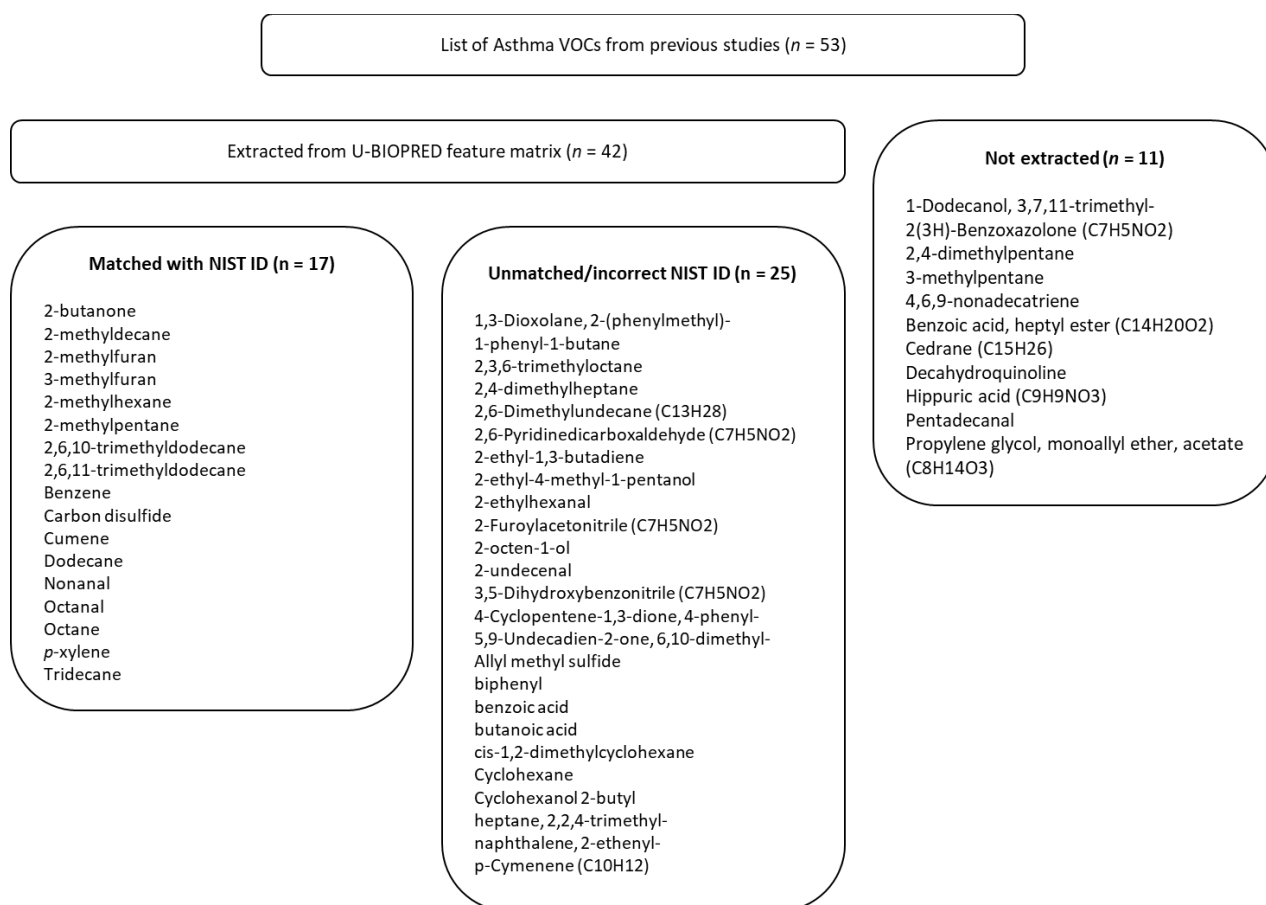


Figure S2. A flow chart detailing the results from the identification process of known asthma VOCs, using their ion fragments to search the U-BIOPRED feature matrix.

**Table S3. A pairwise matrix showing the instrument similarity analysis results from the Procrustes**

test						
3 PCs		GC-MS	Lonestar	Cyranose	Tor Vergata	Comon Invent
GC-MS		–				
	Lonestar	<i>R</i> 0.2521 ( <i>m</i> <sup>2</sup> 0.9364) <i>p</i> = 0.13187 SES: 1.1544 95% CI: 0.000-0.2807	–			
	Cyranose	<i>R</i> 0.1122 ( <i>m</i> <sup>2</sup> 0.9874) <i>p</i> = 0.87812 SES: -1.1682 95% CI: 0.000-0.2455	<i>R</i> 0.1831 ( <i>m</i> <sup>2</sup> 0.9581) <i>p</i> = 0.2038 SES: 0.7899 95% CI: 0.000-0.2524	–		
	Tor Vergata	<i>R</i> 0.2107 ( <i>m</i> <sup>2</sup> 0.9556) <i>p</i> = 0.25475 SES: 0.6238 95% CI: 0.000-0.2657	<i>R</i> 0.1891 ( <i>m</i> <sup>2</sup> 0.9642) <i>p</i> = 0.3966 SES: 0.2162 95% CI: 0.000-0.2655	<i>R</i> 0.7445 ( <i>m</i> <sup>2</sup> 0.4457) <i>p</i> = 0.000999 SES: 10.4010 95% CI: 0.000-0.2634	–	
	Comon Invent	<i>R</i> 0.173 ( <i>m</i> <sup>2</sup> 0.9701) <i>p</i> = 0.52547 SES: -0.1456 95% CI: 0.000-0.2693	<i>R</i> 0.3554 ( <i>m</i> <sup>2</sup> 0.8737) <i>p</i> = 0.002997 SES: 3.4742 95% CI: 0.000-0.2704	<i>R</i> 0.3919 ( <i>m</i> <sup>2</sup> 0.8464) <i>p</i> = 0.002997 SES: 4.2358 95% CI: 0.000-0.2540	<i>R</i> 0.2157 ( <i>m</i> <sup>2</sup> 0.9535) <i>p</i> = 0.18382 SES: 0.8761 95% CI: 0.000-0.2628	–

**Table S4. A checklist detailing important considerations within sampling and analysis of breath samples for new multi-site and/or longitudinal studies**

<b>Measure</b>	<b>Key measures</b>	<b>Achieved</b>	<b>Not yet achieved</b>	<b>Not applicable</b>
<b>Breath sampling</b>	Determine suitability of sampling site towards the project (including a risk assessment)			
	Provide calibrated equipment, their maintenance schedules, and sampling SOPs to all sampling sites			
	Provide appropriate training workshops for operators and associated staff at regular intervals			
	Organise and maintain sample storage and transport (e.g. a tracker sample) if required			
<b>Sample analysis</b>	Define a quality assurance program (e.g. databases, calibration, references items, monitoring etc.)			
	Develop a project-specific method and test with control samples			
	Provide appropriate training for operators and associated staff at regular intervals			
<b>Data analysis</b>	Set up a regular sample data quality monitoring infrastructure			
	Perform interim data analysis for longitudinal studies			
	Define data archiving and accessibility			

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