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Breathomics can discriminate between anti IgE-treated and non-treated severe asthma adults

*Original*

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**160. Phenotyping asthma with biomarkers**

OA1463

**Breathomics can discriminate between anti IgE-treated and non-treated severe asthma adults**

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**Rationale:** Omalizumab, an anti-IgE monoclonal antibody, is indicated in adults with severe persistent allergic asthma. Exhaled molecular markers can provide phenotypic information in asthma. **Objectives:** Determine whether adults with severe asthma on omalizumab (anti-IgE<sup>+</sup>) have a different breathprint compared with those who were not on anti-IgE therapy (anti-IgE<sup>-</sup>) as assessed by eNoses and gas chromatography/mass spectrometry (GC/MS) (breathomics). **Methods:** This was a cross-sectional analysis of the U-BIOPRED adult cohort. Severe asthma was defined by IMI-criteria [Bel, Thorax 2011]. Anti-IgE<sup>+</sup> patients were on a regular treatment with s.c. omalizumab (150-375 mg) every 2-4 weeks. Exhaled volatile compounds trapped on adsorption tubes were analysed by a centralized eNose platform (Owlstone Lonestar, two Cyranose 320, Comon Invent, Tor Vergata TEN), including a total of 190 sensors, and GC/MS. Recursive feature elimination (<http://topepo.github.io/caret/rfe.html>) was used for feature selection and random forests, more robust to overfitting, for classification. **Results:** 9 anti-IgE<sup>+</sup> (females/males 2/7, age 52.6±16.3 years, mean±SD, 1/2/6 current/ex/nonsmokers, pre-bronchodilator FEV<sub>1</sub> 70.6±21.1% predicted value) and 30 anti-IgE<sup>-</sup> patients (18/12 females/males, age 53.2±14.2 years, 0/16/14 current/ex/nonsmokers, pre-bronchodilator FEV<sub>1</sub> 59.6±30.7% predicted value) were studied. Accuracy of classification is shown in Table 1.

Table 1

eNose/Technique	Variables	Accuracy
TOR	4	0.87
LONE	71	0.83
CYRA2	12	0.82
CI	2	0.87
CYRA1	14	0.75
All eNoses	110	0.85
GC/MS	96	0.83
eNoses+GC/MS	16	0.83

**Conclusions:** Preliminary results suggest that breathomics can distinguish between anti-IgE<sup>+</sup> and anti-IgE<sup>-</sup> severe asthma patients.