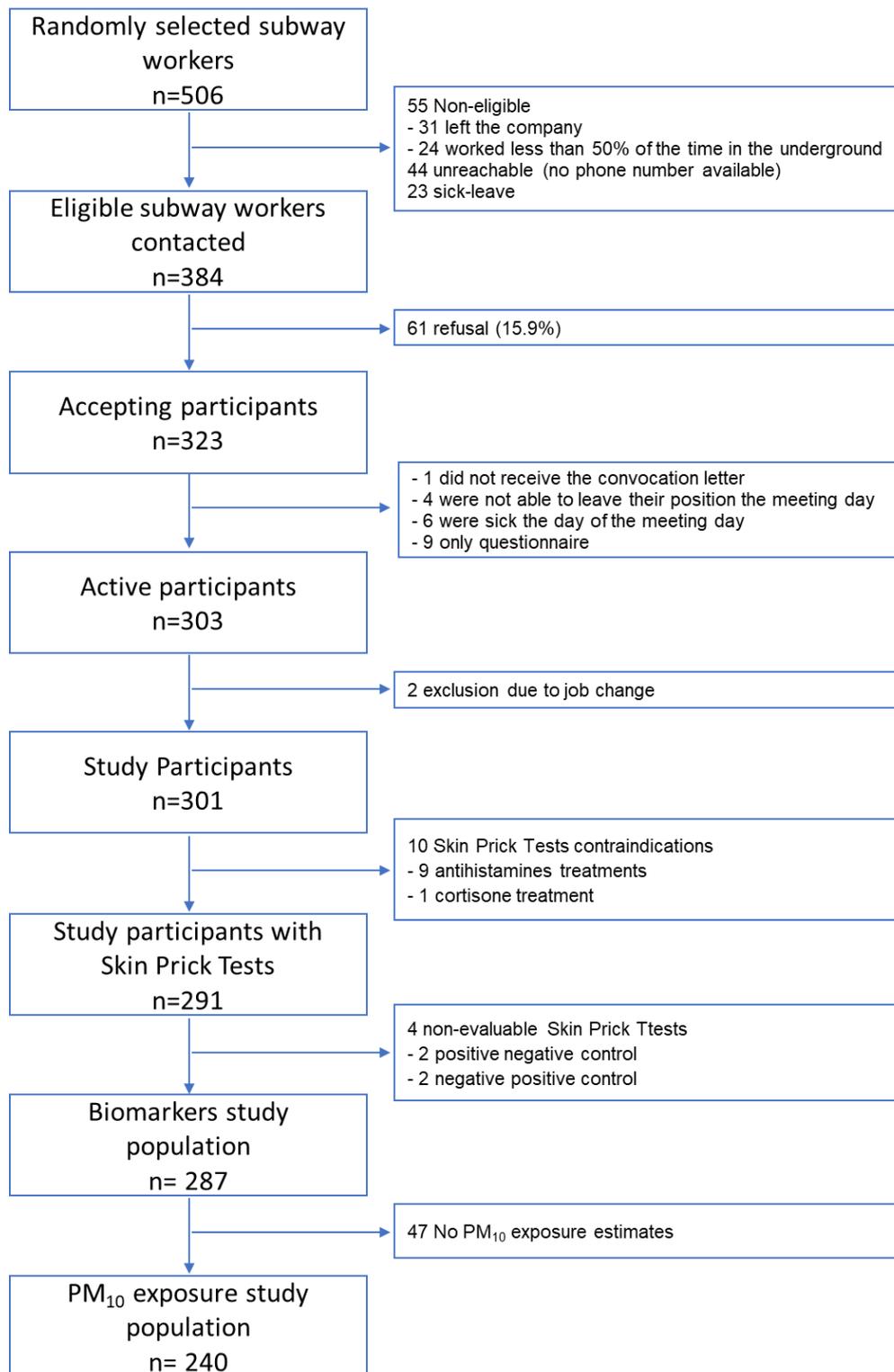


## Supplementary materials for Online Open Access Repository

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**Supplementary figure 1:** Flow Chart of participant selection



Abbreviations: PM<sub>10</sub> Particulate matter less than 10 microns

**Supplementary Table 1: Sample description**

Variable	PM <sub>10</sub> exposure study population n=240	Biomarkers study population n=287
Gender, male, n (%)	102 (42.5%)	144 (50.2%)
Mean age, years, m (SD)	52.6 (5.3)	52.3 (5.3)
Age category		
40-45	31 (12.9%)	38 (13.2%)
45-50	30 (12.5%)	41 (14.3%)
50-55	80 (33.3%)	96 (33.4%)
55-60	89 (37.1%)	102 (35.5%)
60+	10 (4.2%)	10 (3.5%)
BMI (kg/m <sup>2</sup> ), m (SD)	26.0 (4.6) 4*	26.0 (4.3) 4*
Subway occupations, n (%)		
Station agents	121 (50.4%)	121 (42.2%)
Locomotive operators	119 (49.6%)	120 (41.8%)
Security guards	0 (0%)	46 (16.0%)
Smoking category, n (%)		
Non smoker	116 (48.3%)	144 (50.2%)
Current smoker	90 (37.5%)	105 (36.6%)
Ex-smoker	34 (14.2%)	38 (13.2%)
Tobacco exposure, pack-years, m (SD)	16.6 (15.4)	15.5 (14.9)
Employment duration in years, m (SD)	24.6 (6.5)	24.2 (6.3)
Exposure duration in years, m (SD)	23.3 (7.4)	23.1 (7.0)
Mean PM <sub>10</sub> concentration at workplace in µg/m <sup>3</sup> , m (SD)	76.7 (34.5)	
Mean inhaled PM <sub>10</sub> mass (iPM <sub>10</sub> ) in µg/shift, m (SD)	0.6 (0.2)	-
Atopic sensitization	84 (35.0%)	111 (38.7%)
Mono-sensitization (1 allergen in SPT)	30 (12.5%)	39 (13.6%)
Poly-sensitization (>1 allergen in SPT)	54 (22.5%)	72 (25.1%)
Mugwort ( <i>Artemisia vulgaris</i> )	10 (4.2%) 6*	12 (4.2%) 8*
Ragweed ( <i>Ambrosia artemisiifolia</i> )	4 (1.7%) 6*	4 (1.4%) 8*
Timothygrass ( <i>Phleum pratense</i> )	37 (15.4%) 6*	50 (17.4%) 8*
Birchtree ( <i>Betula verrucosa</i> )	26 (10.8%)	29 (10.1%)
Cypress ( <i>Cupressus Arizonica</i> )	7 (2.9%)	8 (2.8%)
Platane ( <i>Platanus acerifolia</i> )	12 (5.0%)	14 (4.9%)
<i>Aspergillus fumigatus</i>	7 (2.9%)	9 (3.1%)
<i>Alternaria</i>	11 (4.6%)	12 (4.2%)
European Dust Mites ( <i>Dermatophagoïde pteronyssius</i> )	42 (17.5%)	57 (19.9%)
American Dust Mite ( <i>Dermatophagoides farinae</i> )	37 (15.4%)	47 (16.4%)
Cat Air	17 (7.1%)	25 (8.7%)
Dog air	13 (5.4%)	17 (5.9%)
Asthma		
Ever asthma	21 (8.8%)	25 (8.7%)
Current asthma	12 (5.0%)	14 (4.9%)
Rhinitis		
Ever rhinitis	94 (39.2%)	113 (39.4%)
Current rhinitis	82 (34.2%)	100 (34.8%)
Eczema		
Ever Eczema	45 (18.8%)	55 (19.2%)
Current Eczema	27 (11.3%)	33 (11.5%)

Note: values shown are mean (SD) or number (%) of subjects where appropriate. \* number of missing data (missing allergen extracts for SPT). Abbreviations: BMI body mass index, m mean, PM<sub>10</sub> Particulate matter less than 10 microns, SD standard deviation, SPT Skin Prick Tests. Lifetime smoking exposure was calculated by multiplying the estimation of cigarette packs smoked per day by the number of years smoking.

**Supplementary Table 2:** Relationship between EBC nitrite or nitrate levels and atopic sensitization

Logistic regression adjusted model	n	Nitrite ( $\mu\text{mol/L}$ )			Nitrate ( $\mu\text{mol/L}$ )		
		aOR	95%-CI	<i>p</i> <sup>a</sup>	aOR	95%-CI	<i>p</i> <sup>a</sup>
Atopic sensitization	280	2.95	1.21 - 7.19	<b>0.02</b>	2.81	0.94 - 8.45	0.07
Poly-Atopic sensitization (vs no atopic sensitization)	243	3.94	1.35 - 11.54	<b>0.01</b>	2.51	0.70 - 9.01	0.16

Logistic regression adjusted models are adjusted on age, sex, and smoking status.

<sup>a</sup> Associations with a *p*-value of <0.05 are bolded.

Abbreviations: aOR adjusted Odds Ratio, CI confidence interval, OR Odds Ratios, *p* p-value.





**Supplementary Material Table 3:** Eight measured biomarkers concentration

<b>Biomarker Median [IQR], missing data</b>	<b>No Atopic sensitization n = 176</b>	<b>Atopic sensitization n = 111</b>	<b>Total n=287</b>	<b>[0;LOD] n (%)</b>	<b>[LOD;LOQ] n (%)</b>	<b>LOD Value</b>	<b>LOQ value</b>
Nitrite (µmol/L)	1.0 [0.7-1.7], 5	1.2 [0.7-1.7], 2	1.1 [0.7-1.7], 7	1 (0.4%)	8 (2.8%)	0,1	0,3
Nitrate (µmol/L)	12.5 [8.3-15.9], 5	13.3 [9.4-16.3], 2	12.6 [8.8-16.0], 7	1 (0.4%)	3 (1.1%)	0,25	0,75
Lactate (µmol/L)	2.5 [1.0-4.5], 5	1.8 [0.4-4.1], 2	2.2 [0.6-4.4], 7	14 (4.9%)	30 (10.5%)	0,1	0,3
Butyrate (µmol/L)	1.0 [0.5-1.7], 5	0.7 [0.4-1.6], 2	0.9 [0.4-1.7], 7	3 (1.1%)	41 (14.3%)	0,1	0,3
Formate (µmol/L)	1.5 [1.0-2.1], 5	1.4 [1.1-2.1], 2	1.5 [1.1-2.1], 7	2 (0.7%)	1 (0.4%)	0,1	0,3
Propionate (µmol/L)	9.6 [4.6-18.3], 5	9.2 [5.0-16.0], 2	9.3 [4.7-17.2], 7	1 (0.4%)	0 (0.0%)	0,1	0,3
Acetate (µmol/L)	35.9 [22.8-58.2], 5	34.8 [21.8-49.1], 2	35.1 [22.5-55.5], 7	0 (0.0%)	0 (0.0%)	0,25	0,75
MDA (pg/mL)	268.9 [164.7-434.1], 1	239.8 [124.8-396.6], 2	261.3 [147.9-411.3], 3	6 (2.1%)	17 (5.9%)	25	75

Abbreviations: IQR Interquartile range, LOD Limit of detection, LOQ Limit of quantification, MDA Malondialdehyde

**Supp material 1:** List of the 12 allergen extracts

We used the following allergen extracts:

- Mugwort (*Artemisia vulgaris*)
- Ragweed (*Ambrosia artemisiifolia*)
- Timothygrass (*Phleum pratense*)
- Birchtree (*Betula verrucosa*)
- Cypress (*Cupressus Arizonica*)
- Platane (*Platanus acerifolia*)
- *Aspergillus fumigatus*
- *Alternaria*
- European Dust Mites (*Dermatophagoïde pteronyssius*)
- American Dust Mite (*Dermatophagoides farinae*)
- Cat Air
- Dog air