

Table SI. Answers in the study questionnaire

| Survey questions                                           | Children (n = 86) |                   |       | Adults (n = 162)   |                   |       | Total (n = 248)    |                   |       |
|------------------------------------------------------------|-------------------|-------------------|-------|--------------------|-------------------|-------|--------------------|-------------------|-------|
|                                                            | Exposed           | Control           | p     | Exposed            | Control           | p     | Exposed            | Control           | p     |
|                                                            | (n = 59)<br>n (%) | (n = 27)<br>n (%) |       | (n = 117)<br>n (%) | (n = 45)<br>n (%) |       | (n = 176)<br>n (%) | (n = 72)<br>n (%) |       |
| 1. Eczema as a child                                       | 25/57 (44)        | 12/26 (46)        | >0.30 | 39/113 (35)        | 16/44 (36)        | >0.30 | 64/170 (38)        | 28/70 (40)        | >0.30 |
| 2. Psoriasis or other eczema                               | 3/56 (5)          | 1/27 (4)          | >0.30 | 19/108 (18)        | 10/45 (22)        | >0.30 | 22/164 (13)        | 11/72 (15)        | >0.30 |
| 3. Metal allergy                                           | 3/59 (5)          | 3/26 (12)         | >0.30 | 20/116 (17)        | 9/45 (20)         | >0.30 | 23/174 (13)        | 12/71 (17)        | >0.30 |
| 4. Pierced ears                                            | 16/59 (27)        | 9/27 (33)         | >0.30 | 63/116 (54)        | 27/45 (60)        | >0.30 | 79/175 (45)        | 36/72 (50)        | >0.30 |
| 5. Body piercing                                           | 4/59 (7)          | 1/27 (4)          | >0.30 | 5/116 (4)          | 4/45 (9)          | 0.27  | 9/175 (5)          | 5/72 (7)          | >0.30 |
| 6. Deodorant use                                           | 37/59 (63)        | 19/26 (73)        | >0.30 | 107/115 (93)       | 42/45 (93)        | >0.30 | 144/174 (83)       | 61/71 (86)        | >0.30 |
| 7. Rash from deodorant                                     | 4/53 (8)          | 3/25 (12)         | >0.30 | 33/116 (28)        | 16/45 (36)        | >0.30 | 37/169 (22)        | 19/70 (27)        | >0.30 |
| 8. Antacids                                                | 2/59 (3)          | 2/27 (7)          | >0.30 | 30/114 (26)        | 17/45 (38)        | 0.18  | 32/173 (18)        | 19/72 (26)        | 0.17  |
| 9. Exposure to aluminium (i.e. at work or through hobbies) | 3/57 (5)          | 1/27 (4)          | >0.30 | 22/111 (20)        | 7/44 (16)         | >0.30 | 25/168 (15)        | 8/71 (11)         | >0.30 |
| 10. Received vaccination against:                          |                   |                   |       |                    |                   |       |                    |                   |       |
| a. Diphtheria                                              | 54/55 (98)        | 20/21 (95)        | >0.30 | 73/78 (94)         | 26/27 (96)        | >0.30 | 127/133 (95)       | 46/48 (96)        | >0.30 |
| b. Tetanus                                                 | 58/58 (100)       | 21/22 (95)        | 0.27  | 105/106 (99)       | 42/42 (100)       | >0.30 | 163/164 (99)       | 63/64 (98)        | >0.30 |
| c. Pertussis                                               | 49/53 (92)        | 17/18 (94)        | >0.30 | 38/55 (69)         | 17/23 (74)        | >0.30 | 87/108 (81)        | 34/41 (83)        | >0.30 |
| d. <i>Haemophilus influenzae</i> type b                    | 39/45 (87)        | 18/19 (95)        | >0.30 | 12/52 (23)         | 4/25 (16)         | >0.30 | 51/97 (53)         | 22/44 (50)        | >0.30 |
| e. Polio                                                   | 55/55 (100)       | 21/22 (95)        | 0.29  | 86/89 (97)         | 35/36 (97)        | >0.30 | 141/144 (98)       | 56/58 (97)        | >0.30 |
| 11. Other vaccines                                         | 16/57 (28)        | 7/24 (29)         | >0.30 | 52/96 (54)         | 19/40 (48)        | >0.30 | 68/153 (44)        | 26/64 (41)        | >0.30 |

Table SII. Information collected in the clinical trial record.

|                                                          | Children (n=86)   |                   |       | Adults (n=162)     |                   |       | Total (n=248)      |                   |       |
|----------------------------------------------------------|-------------------|-------------------|-------|--------------------|-------------------|-------|--------------------|-------------------|-------|
|                                                          | Exposed<br>(n=59) | Control<br>(n=27) | p     | Exposed<br>(n=117) | Control<br>(n=45) | p     | Exposed<br>(n=176) | Control<br>(n=72) | p     |
|                                                          | n (%)             | n (%)             |       | n (%)              | n (%)             |       | n (%)              | n (%)             |       |
| Median age at study (range)                              | 12 (5–17)         | 12 (6–17)         | 0.24  | 34 (18–65)         | 32 (18–74)        | >0.30 | 27 (5–65)          | 26 (6–74)         | >0.30 |
| Sex (% males)                                            | 37/59 (63)        | 19/27 (70)        | >0.30 | 54/117 (46)        | 15/45 (33)        | 0.16  | 91/176 (52)        | 34/72 (47)        | >0.30 |
| Eczema as a child                                        | 23/57 (40)        | 14/25 (56)        | 0.23  | 42/113 (37)        | 17/43 (40)        | >0.30 | 65/170 (38)        | 31/68 (46)        | >0.30 |
| Psoriasis or other eczema                                | 12/59 (20)        | 6/25 (24)         | >0.30 | 14/113 (12)        | 8/43 (19)         | >0.30 | 26/172 (15)        | 14/68 (21)        | >0.30 |
| ASIT with the following allergen extracts <sup>a</sup> : |                   |                   |       |                    |                   |       |                    |                   |       |
| 12. Birch                                                | 33/59 (56)        | 14/27 (52)        | >0.30 | 65/117 (56)        | 23/45 (51)        | >0.30 | 98/176 (56)        | 37/72 (51)        | >0.30 |
| 13. 3-trees (alder, birch, hazel) <sup>b</sup>           | 10/59 (17)        | 0/27 (0)          | 0.027 | 12/117 (10)        | 6/45 (13)         | >0.30 | 22/176 (12)        | 6/72 (8)          | >0.30 |
| 14. Timothy                                              | 6/59 (10)         | 0/27 (0)          | 0.17  | 4/117 (3)          | 1/45 (2)          | >0.30 | 10/176 (6)         | 1/72 (1)          | 0.18  |
| 15. PDL-grass (Phl p, Dac g, Lol p)                      | 6/59 (10)         | 0/27 (0)          | 0.17  | 26/117 (22)        | 8/45 (18)         | >0.30 | 32/176 (18)        | 8/72 (11)         | 0.19  |
| 16. 5-grass pollen mixture                               | 35/59 (59)        | 17/27 (63)        | >0.30 | 50/117 (43)        | 25/45 (56)        | 0.16  | 85/176 (48)        | 42/72 (58)        | 0.16  |
| 17. Mugwort ( <i>Artemisia vulgaris</i> )                | 0/59 (0)          | 1/27 (4)          | >0.30 | 14/117 (12)        | 5/45 (11)         | >0.30 | 14/176 (8)         | 6/72 (8)          | >0.30 |
| 18. Horse epithelium                                     | 0/59 (0)          | 1/27 (4)          | >0.30 | 2/117 (2)          | 0/45 (0)          | >0.30 | 2/176 (1)          | 1/72 (1)          | >0.30 |
| 19. Cat dander                                           | 6/59 (10)         | 3/27 (11)         | >0.30 | 27/117 (23)        | 14/45 (31)        | >0.30 | 33/176 (19)        | 17/72 (24)        | >0.30 |
| 20. Dog dander                                           | 0/59 (0)          | 0/27 (0)          | >0.30 | 16/117 (14)        | 8/45 (18)         | >0.30 | 16/176 (9)         | 8/72 (11)         | >0.30 |
| 21. <i>Dermatophagoides pteronyssinus</i>                | 4/59 (7)          | 1/27 (4)          | >0.30 | 6/117 (5)          | 4/45 (9)          | >0.30 | 10/176 (6)         | 5/72 (7)          | >0.30 |
| 22. <i>Dermatophagoides farinae</i>                      | 4/59 (7)          | 1/27 (4)          | >0.30 | 2/117 (2)          | 3/45 (7)          | 0.13  | 6/176 (3)          | 4/72 (6)          | >0.30 |
| 23. 2-D, <i>Dermatophag. pter+farinae</i>                | 6/59 (10)         | 3/27 (11)         | >0.30 | 12/117 (10)        | 7/45 (16)         | >0.30 | 18/176 (10)        | 10/72 (14)        | >0.30 |
| 24. Honeybee venom                                       | 0/59 (0)          | 0/27 (0)          | >0.30 | 6/117 (5)          | 0/45 (0)          | 0.19  | 6/176 (3)          | 0/72 (0)          | 0.19  |
| 25. Yellow jacket venom                                  | 0/59 (0)          | 0/27 (0)          | >0.30 | 9/117 (8)          | 1/45 (2)          | 0.29  | 9/176 (5)          | 1/72 (1)          | 0.29  |

<sup>a</sup>All allergen extracts provided by ALK-Abelló A/S, Hørsholm, Denmark. <sup>b</sup>3-trees allergen extract was replaced by birch allergen extract in 2008 at the paediatric units.

Values are given as median value, range in brackets, or number of positive answers of total with percentage in brackets. *p*-values for the group comparisons (exposed vs. controls) were obtained from Mann-Whitney *U* test (age) and from Fisher's exact test (binary characteristics)

Table SIII. Results of patch-tests and information concerning atopic dermatitis (AD) and deodorant sensitivity in the 8 participants with contact allergy to aluminium

|                  |            |       | Patch-test to aluminium |       |                    |       |                    |              |       |     |                       |  |
|------------------|------------|-------|-------------------------|-------|--------------------|-------|--------------------|--------------|-------|-----|-----------------------|--|
| Sex              | Age, years | Group | 2.0% <sup>c</sup>       |       | 10.0% <sup>c</sup> |       | 20.0% <sup>c</sup> | Finn Chamber |       | AD  | Deodorant sensitivity |  |
|                  |            |       | Day 3                   | Day 7 | Day 3              | Day 7 | Day 4 <sup>a</sup> | Day 3        | Day 7 |     |                       |  |
| <i>Exposed</i>   |            |       |                         |       |                    |       |                    |              |       |     |                       |  |
| F                | 18         | 1     | +                       | +     | ++                 | ++    | NT <sup>b</sup>    | –            | –     | Yes | No                    |  |
| F                | 16         | 1     | –                       | –     | +                  | (+)   | NT                 | –            | –     | Yes | No                    |  |
| M                | 12         | 3     | (+)                     | +     | (+)                | +     | +                  | –            | –     | Yes | No                    |  |
| M                | 9          | 2     | –                       | (+)   | –                  | +     | NT                 | –            | –     | Yes | No                    |  |
| <i>Unexposed</i> |            |       |                         |       |                    |       |                    |              |       |     |                       |  |
| F                | 15         | 0     | (+)                     | –     | (+)                | +     | +                  | –            | –     | No  | No                    |  |
| F                | 13         | 0     | +                       | +     | ++                 | +     | NT                 | –            | –     | Yes | No                    |  |
| F                | 31         | 0     | +                       | –     | –                  | –     | –                  | –            | –     | No  | Yes                   |  |
| F                | 27         | 0     | +                       | +     | ++                 | ++    | NT                 | –            | –     | Yes | Yes                   |  |

<sup>a</sup>If the result from the reading on day 3 was questionable a retest was conducted with 20.0% aluminium chloride hexahydrate in petrolatum on the same day and read only once, i.e. on day 4. <sup>b</sup>Not tested. <sup>c</sup>Aluminium chloride hexahydrate in petrolatum.

(+): doubtful patch-test reaction; +, ++: positive patch-test reactions with an allergic morphology; –: negative patch-test reaction.

Table SIV. Association between atopic dermatitis (AD) and contact allergy to aluminium in exposed and unexposed individuals. p-values were obtained from Fisher's exact test

| Groups             | AD  |    |       | p-value            |
|--------------------|-----|----|-------|--------------------|
|                    | Yes | No | Total |                    |
| Exposed            | 50  | 79 | 129   | 0.021 <sup>a</sup> |
| Aluminium-positive | 4   | 0  | 4     |                    |
| Aluminium-negative | 46  | 79 | 125   |                    |
| Unexposed          | 31  | 37 | 68    | >0.3 <sup>b</sup>  |
| Aluminium-positive | 2   | 2  | 4     |                    |
| Aluminium-negative | 29  | 35 | 64    |                    |

Comparison of aluminium allergy in <sup>a</sup>exposed individuals and <sup>b</sup>unexposed individuals with and without AD.

<sup>a</sup>Comparisons baseline vs. after one year within the group of the exposed. <sup>b</sup>Comparisons between exposed and unexposed. SA: Self-assessed; Inv: Investigator-assessed.

| Groups                    | Presence of nodules |        |                              |                 | Presence of pruritus |                |       |                             |                           |                             |     |                           |
|---------------------------|---------------------|--------|------------------------------|-----------------|----------------------|----------------|-------|-----------------------------|---------------------------|-----------------------------|-----|---------------------------|
|                           | After one year      |        | <i>p</i> -value              | <i>p</i> -value |                      |                |       |                             |                           |                             |     |                           |
|                           | Baseline            | Intra  |                              | Baseline        |                      | After one year |       | Intra <sup>a</sup>          |                           | Inter <sup>b</sup>          |     |                           |
|                           |                     |        |                              | SA              | Inv                  | SA             | Inv   | SA                          | Inv                       | SA                          | Inv |                           |
| Exposed                   | 0/130               | 23/130 | <0.001<br>(0/130 vs. 23/130) | 12/94           | 2/98                 | 56/94          | 10/98 | <0.001<br>(12/94 vs. 56/94) | 0.039<br>(2/98 vs. 10/98) |                             |     |                           |
| Unexposed                 | 0/72                | NA     |                              | 4/50            | 0/68                 | NA             | NA    |                             |                           |                             |     |                           |
| Exposed vs. unexposed:    |                     |        |                              |                 |                      |                |       |                             |                           |                             |     |                           |
| (i) Baseline vs. baseline |                     |        |                              |                 |                      |                |       |                             |                           | >0.3<br>(0/72 vs. 0/130)    |     | >0.3<br>(0/68 vs. 2/98)   |
| (ii) Baseline vs. 1 year  |                     |        |                              |                 |                      |                |       |                             |                           | <0.001<br>(0/72 vs. 23/130) |     | 0.006<br>(0/68 vs. 10/98) |