



## Clinical trial results:

**A multicenter, randomized, open-label clinical trial to evaluate safety and tolerability of a year-round initiation of specific immunotherapy with an aluminum hydroxide adsorbed allergoid preparation of 6-grasses in patients with moderate to severe seasonal rhinitis or rhinoconjunctivitis with or without controlled asthma**

### Summary

|                          |                  |
|--------------------------|------------------|
| EudraCT number           | 2015-002409-13   |
| Trial protocol           | DE               |
| Global end of trial date | 15 February 2017 |

### Results information

|                                |                 |
|--------------------------------|-----------------|
| Result version number          | v1 (current)    |
| This version publication date  | 26 October 2018 |
| First version publication date | 26 October 2018 |

### Trial information

#### Trial identification

|                       |          |
|-----------------------|----------|
| Sponsor protocol code | AL1501AV |
|-----------------------|----------|

#### Additional study identifiers

|                                    |   |
|------------------------------------|---|
| ISRCTN number                      | - |
| ClinicalTrials.gov id (NCT number) | - |
| WHO universal trial number (UTN)   | - |

Notes:

### Sponsors

|                              |                                                                          |
|------------------------------|--------------------------------------------------------------------------|
| Sponsor organisation name    | ALLERGOPHARMA GMBH & CO. KG.                                             |
| Sponsor organisation address | Hermann-Körner-Straße 52, Reinbek, Germany, 21465                        |
| Public contact               | Clinical Trials Information, Allergopharma GmbH & Co. KG, 0049 40427650, |
| Scientific contact           | Clinical Trials Information, Allergopharma GmbH & Co. KG, 0049 40427650, |

Notes:

### Paediatric regulatory details

|                                                                      |    |
|----------------------------------------------------------------------|----|
| Is trial part of an agreed paediatric investigation plan (PIP)       | No |
| Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial? | No |
| Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial? | No |

Notes:

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## Results analysis stage

|                                                      |                  |
|------------------------------------------------------|------------------|
| Analysis stage                                       | Final            |
| Date of interim/final analysis                       | 07 July 2017     |
| Is this the analysis of the primary completion data? | No               |
| <hr/>                                                |                  |
| Global end of trial reached?                         | Yes              |
| Global end of trial date                             | 15 February 2017 |
| Was the trial ended prematurely?                     | No               |

Notes:

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## General information about the trial

Main objective of the trial:

The study consisted of 2 treatment groups (Group A and Group B). Subjects in Group A started dose escalation without any time constraints relative to the pollen season and subjects in Group B after the pollen season. Other than the starting time for dose escalation and the number of subjects, there were no differences in the subject population or dosing schedule between the groups.

1) The main objective of this therapeutic phase IIIb trial was to evaluate the safety and tolerability of a year-round initiation start of immunotherapy with Allergovit® 6-grasses in patients with rhinitis or rhinoconjunctivitis, caused by grasses, with or without controlled allergic asthma compared to a standard therapy.

2) Evaluate the a possible influence (masking of adverse events) of a symptomatic co-medication during intra seasonal therapy.

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Protection of trial subjects:

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki, and that are consistent with the International Conference on Harmonization of technical requirements for registration of pharmaceuticals for human use (ICH) guidance for Good Clinical Practice (GCP) and the applicable regulatory requirements.

Data Safety Monitoring Board (DSMB ) was in place throughout the trial; DSMB consisted of 3 independent physicians, experienced in the field of allergy. The primary function of the DSMB was to ensure the subjects' safety. The DSMB team reviewed an update of the safety data from all treated subjects every week.

For subjects who received a vaccination against viral or bacterial pathogens or for other reasons, there was a provision in the study protocol for a period of time between the vaccination and the start of the immunotherapy.

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Other than routine care, no specific measures were implemented for the protection of trial subjects.

Background therapy:

Medication for the treatment of rhinitis and rhinoconjunctivitis was permitted and had to be documented as concomitant medication.

Subjects with bronchial asthma who required regular basic treatment of their allergic asthma had to be treated as recommended by GINA (GINA, 2015) to control their asthma. However, the in- and exclusion criteria had to be strictly followed. The start of additional asthma medication was not permitted during the duration of the trial.

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Evidence for comparator:

Abbreviations used in this document:

AE=Adverse event

AIT=Allergen immunotherapy

DSMB=Data Safety Monitoring Board

ICF=Informed consent form

IMP=Investigational medicinal product

MedDRA=Medical Dictionary for Regulatory Activities

NIA=National Institute on Aging

PEF=Peak flow measurement  
P. pratense= Phleum pratense  
T=Treatment (as in T1 =Treatment visit 1, etc.)  
TEAE=Treatment-emergent adverse event  
TU/mL=Therapeutic units per mL  
WAO=World Allergy Organization

|                                                           |                 |
|-----------------------------------------------------------|-----------------|
| Actual start date of recruitment                          | 26 January 2016 |
| Long term follow-up planned                               | No              |
| Independent data monitoring committee (IDMC) involvement? | Yes             |

Notes:

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## Population of trial subjects

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### Subjects enrolled per country

|                                      |              |
|--------------------------------------|--------------|
| Country: Number of subjects enrolled | Germany: 240 |
| Worldwide total number of subjects   | 240          |
| EEA total number of subjects         | 240          |

Notes:

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### Subjects enrolled per age group

|                                           |     |
|-------------------------------------------|-----|
| In utero                                  | 0   |
| Preterm newborn - gestational age < 37 wk | 0   |
| Newborns (0-27 days)                      | 0   |
| Infants and toddlers (28 days-23 months)  | 0   |
| Children (2-11 years)                     | 0   |
| Adolescents (12-17 years)                 | 0   |
| Adults (18-64 years)                      | 240 |
| From 65 to 84 years                       | 0   |
| 85 years and over                         | 0   |

## Subject disposition

### Recruitment

Recruitment details:

Overall, 314 adult male and female subjects (18-64 y)] were screened for eligibility; 240 subjects were randomised to treatment, according to the exclusion and inclusion criteria.

### Pre-assignment

Screening details:

Screened and randomised to treatment according to the exclusion and inclusion criteria.

### Period 1

|                              |                            |
|------------------------------|----------------------------|
| Period 1 title               | Treatment (overall period) |
| Is this the baseline period? | Yes                        |
| Allocation method            | Randomised - controlled    |
| Blinding used                | Not blinded                |

### Arms

|                              |         |
|------------------------------|---------|
| Are arms mutually exclusive? | Yes     |
| <b>Arm title</b>             | Group A |

Arm description:

Subjects started treatment without any time constraints relative to the pollen season.

|                                        |                          |
|----------------------------------------|--------------------------|
| Arm type                               | Experimental             |
| Investigational medicinal product name | Allergovit® 6-grasses    |
| Investigational medicinal product code |                          |
| Other name                             |                          |
| Pharmaceutical forms                   | Suspension for injection |
| Routes of administration               | Subcutaneous use         |

Dosage and administration details:

The IMP is an aluminium hydroxide-adsorbed allergoid preparation of Allergovit® 6-grasses (TU/mL).

PEF was performed before and 30 minutes after each injection (observe respiratory symptoms and PEF value was less than 70% of predicted normal). The IMP was administered at the trial site, as slow, subcutaneous injection, under sterile measures, on the extensor side of the upper arm, above the elbow. After each administration of the IMP, patients remained under supervision for at least 30 min.

IMP strength A (1,000 TU/mL) and IMP strength B (10,000 TU/mL).

Dose escalation schedule every 7 days: 100, 200, 400, 800, 1500, 3000, 6000 TU

Maintenance 2 weeks after last dose: 6000 TU, then 4 weeks after last dose 6000 TU

The majority of subjects (> 80%) reached the maintenance dose without any dose reduction, and the number of subjects needing a dose adjustment did not relevantly differ between treatment groups.

|                  |         |
|------------------|---------|
| <b>Arm title</b> | Group B |
|------------------|---------|

Arm description:

Subjects started treatment after the pollen season.

|                                        |                          |
|----------------------------------------|--------------------------|
| Arm type                               | Experimental             |
| Investigational medicinal product name | Allergovit® 6-grasses    |
| Investigational medicinal product code |                          |
| Other name                             |                          |
| Pharmaceutical forms                   | Suspension for injection |
| Routes of administration               | Subcutaneous use         |

Dosage and administration details:

The IMP is an aluminium hydroxide-adsorbed allergoid preparation of Allergovit® 6-grasses (TU/mL).

PEF was performed before and 30 minutes after each injection (observe respiratory symptoms and PEF value was less than 70% of predicted normal). The IMP was administered at the trial site, as slow,

subcutaneous injection, under sterile measures, on the extensor side of the upper arm, above the elbow. After each administration of the IMP, patients remained under supervision for at least 30 min.

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Maintenance 2 weeks after last dose: 6000 TU, then 4 weeks after last dose 6000 TU

The majority of subjects (> 80%) reached the maintenance dose without any dose reduction, and the number of subjects needing a dose adjustment did not relevantly differ between treatment groups.

| <b>Number of subjects in period 1</b>  | Group A | Group B |
|----------------------------------------|---------|---------|
| Started                                | 161     | 79      |
| Completed                              | 139     | 65      |
| Not completed                          | 22      | 14      |
| Consent withdrawn by subject           | 4       | 4       |
| Adverse event, non-fatal               | 10      | 3       |
| Other (Travel plans)                   | -       | 3       |
| Travel plans; Long interval btw. doses | 4       | -       |
| Lost to follow-up                      | 4       | 3       |
| Incl./ Excl. criteria                  | -       | 1       |

## Baseline characteristics

### Reporting groups

|                                                                                        |         |
|----------------------------------------------------------------------------------------|---------|
| Reporting group title                                                                  | Group A |
| Reporting group description:                                                           |         |
| Subjects started treatment without any time constraints relative to the pollen season. |         |
| Reporting group title                                                                  | Group B |
| Reporting group description:                                                           |         |
| Subjects started treatment after the pollen season.                                    |         |

| Reporting group values | Group A | Group B | Total |
|------------------------|---------|---------|-------|
| Number of subjects     | 161     | 79      | 240   |
| Age categorical        |         |         |       |
| Units: Subjects        |         |         |       |
| Adults (18-64 years)   | 161     | 79      | 240   |
| Age continuous         |         |         |       |
| Units: years           |         |         |       |
| arithmetic mean        | 32.66   | 33.08   |       |
| standard deviation     | ± 9.45  | ± 10.46 | -     |
| Gender categorical     |         |         |       |
| Units: Subjects        |         |         |       |
| Female                 | 74      | 37      | 111   |
| Male                   | 87      | 42      | 129   |
| Race                   |         |         |       |
| Units: Subjects        |         |         |       |
| Asian                  | 8       | 1       | 9     |
| Black/African American | 0       | 1       | 1     |
| White                  | 151     | 75      | 226   |
| Other                  | 2       | 2       | 4     |
| Pet contact            |         |         |       |
| Units: Subjects        |         |         |       |
| Yes; intermittent      | 17      | 8       | 25    |
| Yes; permanent         | 31      | 11      | 42    |
| No                     | 113     | 60      | 173   |
| Smoking status         |         |         |       |
| Units: Subjects        |         |         |       |
| Non-smoker             | 113     | 62      | 175   |
| Ex-smoker              | 17      | 4       | 21    |
| Current smoker         | 31      | 13      | 44    |

### Subject analysis sets

|                                                                                                                                                                                                                                                                            |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Subject analysis set title                                                                                                                                                                                                                                                 | Group A1           |
| Subject analysis set type                                                                                                                                                                                                                                                  | Sub-group analysis |
| Subject analysis set description:                                                                                                                                                                                                                                          |                    |
| Group A1: subjects from Group A with frequent use of antisymptomatic co-medication in the 3 days immediately before and 1 day after the injection (including the date of investigational medicinal product [IMP] administration); information was based on the diary data. |                    |
| Subject analysis set title                                                                                                                                                                                                                                                 | Group A2           |

|                           |                    |
|---------------------------|--------------------|
| Subject analysis set type | Sub-group analysis |
|---------------------------|--------------------|

Subject analysis set description:

Group A2: subjects from Group A without or infrequent use of antisymptomatic co-medication in the 3 days immediately before and 1 day after the injection (including the date of IMP administration); information was based on the diary data.

| <b>Reporting group values</b> | Group A1 | Group A2 |  |
|-------------------------------|----------|----------|--|
| Number of subjects            | 34       | 122      |  |
| Age categorical               |          |          |  |
| Units: Subjects               |          |          |  |
| Adults (18-64 years)          | 34       | 122      |  |
| Age continuous                |          |          |  |
| Units: years                  |          |          |  |
| arithmetic mean               | 32.91    | 32.59    |  |
| standard deviation            | ± 10.20  | ± 9.33   |  |
| Gender categorical            |          |          |  |
| Units: Subjects               |          |          |  |
| Female                        | 22       | 50       |  |
| Male                          | 12       | 72       |  |
| Race                          |          |          |  |
| Units: Subjects               |          |          |  |
| Asian                         | 2        | 6        |  |
| Black/African American        | 0        | 0        |  |
| White                         | 32       | 114      |  |
| Other                         | 0        | 2        |  |
| Pet contact                   |          |          |  |
| Units: Subjects               |          |          |  |
| Yes; intermittent             | 2        | 15       |  |
| Yes; permanent                | 6        | 24       |  |
| No                            | 26       | 83       |  |
| Smoking status                |          |          |  |
| Units: Subjects               |          |          |  |
| Non-smoker                    | 24       | 86       |  |
| Ex-smoker                     | 4        | 13       |  |
| Current smoker                | 6        | 23       |  |

## End points

### End points reporting groups

|                                                                                                                                                                                                                                                                                                                 |                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Reporting group title                                                                                                                                                                                                                                                                                           | Group A            |
| Reporting group description:<br>Subjects started treatment without any time constraints relative to the pollen season.                                                                                                                                                                                          |                    |
| Reporting group title                                                                                                                                                                                                                                                                                           | Group B            |
| Reporting group description:<br>Subjects started treatment after the pollen season.                                                                                                                                                                                                                             |                    |
| Subject analysis set title                                                                                                                                                                                                                                                                                      | Group A1           |
| Subject analysis set type                                                                                                                                                                                                                                                                                       | Sub-group analysis |
| Subject analysis set description:<br>Group A1: subjects from Group A with frequent use of antisymptomatic co-medication in the 3 days immediately before and 1 day after the injection (including the date of investigational medicinal product [IMP] administration); information was based on the diary data. |                    |
| Subject analysis set title                                                                                                                                                                                                                                                                                      | Group A2           |
| Subject analysis set type                                                                                                                                                                                                                                                                                       | Sub-group analysis |
| Subject analysis set description:<br>Group A2: subjects from Group A without or infrequent use of antisymptomatic co-medication in the 3 days immediately before and 1 day after the injection (including the date of IMP administration); information was based on the diary data.                             |                    |

### Primary: 1\_Treatment-emergent adverse events by causal relationship

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| End point title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1_Treatment-emergent adverse events by causal relationship |
| End point description:<br>When assessing the causal relationship of the AE, the following points were taken into account (according to Volume 10 Clinical Trials Guideline, Chapter II Safety Reporting).<br><br>A reasonable possibility of causality to IMP implies that there is evidence for the AE, e.g. <ul style="list-style-type: none"><li>• Reasonable possibility of causality to IMP implies the definitions "reasonable possibility of causality to IMP"</li><li>• Or "reasonable possibility of causality to trial procedure" implies a reasonable possibility of causal relationship between the event and the trial procedure.</li><li>• Temporal occurrence suggest a causal relationship. This means that there are facts (evidence) or arguments to suggest causal relationship</li></ul> |                                                            |
| End point type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Primary                                                    |
| End point timeframe:<br>Between the signature date of the ICF and the final visit, until approx. 30 days after the last IMP administration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                            |

| End point values            | Group A            | Group B         | Group A1             | Group A2             |
|-----------------------------|--------------------|-----------------|----------------------|----------------------|
| Subject group type          | Reporting group    | Reporting group | Subject analysis set | Subject analysis set |
| Number of subjects analysed | 158 <sup>[1]</sup> | 73              | 34                   | 122                  |
| Units: patients             | 108                | 41              | 24                   | 83                   |

Notes:

[1] - Safety set for all treatment/analyses groups

## Statistical analyses



|                                         |                                            |
|-----------------------------------------|--------------------------------------------|
| <b>Statistical analysis title</b>       | Causality of TEAE (Treatment Group A vs B) |
| Comparison groups                       | Group A v Group B                          |
| Number of subjects included in analysis | 231                                        |
| Analysis specification                  | Pre-specified                              |
| Analysis type                           | non-inferiority                            |
| P-value                                 | = 0.0777                                   |
| Method                                  | Fisher exact                               |

|                                         |                                              |
|-----------------------------------------|----------------------------------------------|
| <b>Statistical analysis title</b>       | Causality of TEAE (Treatment Group A1 vs A2) |
| Comparison groups                       | Group A1 v Group A2                          |
| Number of subjects included in analysis | 156                                          |
| Analysis specification                  | Pre-specified                                |
| Analysis type                           | non-inferiority                              |
| P-value                                 | = 0.8372                                     |
| Method                                  | Fisher exact                                 |

### Primary: 2\_Treatment-emergent adverse events by worst intensity

|                 |                                                                       |
|-----------------|-----------------------------------------------------------------------|
| End point title | 2_Treatment-emergent adverse events by worst intensity <sup>[2]</sup> |
|-----------------|-----------------------------------------------------------------------|

End point description:

AE intensity in this trial was assessed by the the investigator's clinical judgement of and based on the description 'Intensity of the AE' according to National Institute on Aging (NIA)

Mild=Transient symptoms, no interference with the patient's daily activities.

Moderate=Marked symptoms, moderate interference with the patient's daily activities.

Severe=Considerable interference with the patient's daily activities.

|                |         |
|----------------|---------|
| End point type | Primary |
|----------------|---------|

End point timeframe:

Between the signature date of the ICF and the final visit, until approx. 30 days after the last IMP administration.

Notes:

[2] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.

Justification: No statistical analysis was performed. Results were evaluated descriptively.

| End point values            | Group A            | Group B         | Group A1             | Group A2             |
|-----------------------------|--------------------|-----------------|----------------------|----------------------|
| Subject group type          | Reporting group    | Reporting group | Subject analysis set | Subject analysis set |
| Number of subjects analysed | 158 <sup>[3]</sup> | 73              | 34                   | 122                  |
| Units: patients             |                    |                 |                      |                      |
| Mild                        | 84                 | 32              | 14                   | 69                   |
| Moderate                    | 51                 | 19              | 12                   | 39                   |
| Severe                      | 9                  | 6               | 2                    | 7                    |

Notes:

[3] - Safety set for all treatment/analyses groups

### Statistical analyses

No statistical analyses for this end point

## Secondary: 3\_Treatment-emergent adverse event anaphylactic systemic reactions according to WAO

|                 |                                                                                     |
|-----------------|-------------------------------------------------------------------------------------|
| End point title | 3_Treatment-emergent adverse event anaphylactic systemic reactions according to WAO |
|-----------------|-------------------------------------------------------------------------------------|

### End point description:

Any TEAE anaphylactic reactions were graded according to the WAO Subcutaneous Immunotherapy Systemic Reaction Grading System (Cox et al., 2010\*) and were based on the organ systems involved and the severity of the reaction.

WAO grading system was used for dose modification in case of an anaphylactic reaction:

- Grade 1: reduction by 1 dose step of the last administered dose
- Grade 2: reduction by 2 dose steps of the last administered dose

For Grade 1 and Grade 2: if the first dose reduction was not tolerated, a second dose reduction by 1 dose step of the last administered dose was to be performed. No more than 2 consecutive dose reductions were allowed.

TEAE=Treatment emergent adverse event

WAO = World Allergy Organization

\*Cox L, Speaking the same language: The World Allergy Organization Subcutaneous Immunotherapy Systemic Reaction Grading System. J Allergy Clin Immunol 2010; 125(3): 569-574.

|                |           |
|----------------|-----------|
| End point type | Secondary |
|----------------|-----------|

### End point timeframe:

Between the signature date of the ICF and the final visit, until approx. 30 days after the last IMP administration.

| End point values            | Group A            | Group B         | Group A1             | Group A2             |
|-----------------------------|--------------------|-----------------|----------------------|----------------------|
| Subject group type          | Reporting group    | Reporting group | Subject analysis set | Subject analysis set |
| Number of subjects analysed | 158 <sup>[4]</sup> | 73              | 34                   | 122                  |
| Units: patients             | 5                  | 2               | 2                    | 3                    |

Notes:

[4] - Safety set for all treatment/analyses groups

## Statistical analyses

|                                         |                                                  |
|-----------------------------------------|--------------------------------------------------|
| Statistical analysis title              | TEAE syst. reaction WAO (Treatment Group A vs B) |
| Comparison groups                       | Group A v Group B                                |
| Number of subjects included in analysis | 231                                              |
| Analysis specification                  | Pre-specified                                    |
| Analysis type                           | non-inferiority                                  |
| P-value                                 | = 1                                              |
| Method                                  | Fisher exact                                     |

|                            |                                                    |
|----------------------------|----------------------------------------------------|
| Statistical analysis title | TEAE syst. reaction WAO (Treatment Group A1 vs A2) |
| Comparison groups          | Group A1 v Group A2                                |

|                                         |                 |
|-----------------------------------------|-----------------|
| Number of subjects included in analysis | 156             |
| Analysis specification                  | Pre-specified   |
| Analysis type                           | non-inferiority |
| P-value                                 | = 0.2989        |
| Method                                  | Fisher exact    |

## Secondary: 4\_Lung function test - PEF

|                 |                            |
|-----------------|----------------------------|
| End point title | 4_Lung function test - PEF |
|-----------------|----------------------------|

### End point description:

Each patient had to undergo a PEF measurement before and 30 minutes after each injection to recognize pulmonary reaction early enough. If respiratory symptoms have increased before the injection or the PEF value was less than 70% of predicted normal, then the injection was postponed until the patient had reached a more stable (asthma) condition. Trial medication administration to a patient with less than 70% of predicted normal was regarded as a protocol deviation.

Results shown are representative for the study visits at the start of the study, at the end of the escalation dose (T7), at the end of the study (T13), and the final visit. Mean and median PEF results were similar between all the groups at all the time points. The number of patients contributing to the data at each of the visits, is also shown.

|                |           |
|----------------|-----------|
| End point type | Secondary |
|----------------|-----------|

### End point timeframe:

30 min before and 30 min after each treatment (T) visit involving IMP administration.  
Visits T1, T2, T3 ... to T13. T1 to T7 were separated by 7 days (dose escalation)  
Visits T8 to T13 were separated by 2 weeks.

| End point values                     | Group A            | Group B           | Group A1             | Group A2             |
|--------------------------------------|--------------------|-------------------|----------------------|----------------------|
| Subject group type                   | Reporting group    | Reporting group   | Subject analysis set | Subject analysis set |
| Number of subjects analysed          | 158 <sup>[5]</sup> | 73 <sup>[6]</sup> | 34 <sup>[7]</sup>    | 122 <sup>[8]</sup>   |
| Units: L/min                         |                    |                   |                      |                      |
| arithmetic mean (standard deviation) |                    |                   |                      |                      |
| Screening                            | 511.73 (± 111.45)  | 493.62 (± 100.31) | 503.56 (± 101.34)    | 514.20 (± 115.10)    |
| T1, before                           | 516.04 (± 104.11)  | 500.58 (± 111.77) | 493.38 (± 84.84)     | 521.97 (± 108.87)    |
| T1, after                            | 517.62 (± 104.29)  | 500.39 (± 110.91) | 492.03 (± 84.86)     | 524.36 (± 108.92)    |
| T7, before                           | 523.99 (± 108.94)  | 503.50 (± 108.20) | 498.69 (± 94.89)     | 530.79 (± 111.81)    |
| T7, after                            | 523.91 (± 107.24)  | 505.30 (± 108.37) | 498.19 (± 88.97)     | 530.82 (± 110.96)    |
| T13, before                          | 500.00 (± 115.18)  | 620.00 (± 0.00)   | 480.00 (± 0.00)      | 506.67 (± 140.12)    |
| T13, after                           | 515.00 (± 99.83)   | 610.00 (± 0.00)   | 460.00 (± 0.00)      | 533.33 (± 113.72)    |
| Final Visit                          | 522.16 (± 110.13)  | 502.44 (± 112.58) | 495.24 (± 90.97)     | 529.56 (± 114.06)    |

### Notes:

[5] - Safety Set  
T1 aft=157  
T7 bfr=151

T7 aft=151  
T13 bfr=4  
T13 aft=4  
Final=153

[6] - Safety Set  
T1 aft=72  
T7 bfr=68  
T7 aft=67  
T13 bfr=1  
T13 aft=1  
Final=70

[7] - Safety Set  
T7 bfr=32  
T7 aft=32  
T13 bfr=1  
T13 aft=1  
Final=33

[8] - Safety Set  
T1 aft=121  
T7 bfr=119  
T7 aft=119  
T13 bfr=3  
T13 aft=3  
Final=120

## Statistical analyses

No statistical analyses for this end point

## Secondary: 5\_Tolerability: Likert scale (Investigator)

|                 |                                             |
|-----------------|---------------------------------------------|
| End point title | 5_Tolerability: Likert scale (Investigator) |
|-----------------|---------------------------------------------|

End point description:

Assessment of the overall tolerability by the investigator using a 5-point Likert scale.  
Likert scale score system: 1=Very bad; 2=Bad; 3=Average; 4=Good; 5=Very good.

Table below shows the number of subjects in each tolerability category of the Likert scale, as assessed by the investigator.

|                |           |
|----------------|-----------|
| End point type | Secondary |
|----------------|-----------|

End point timeframe:

At the final visit/premature termination of the study.

| End point values            | Group A            | Group B         | Group A1             | Group A2             |
|-----------------------------|--------------------|-----------------|----------------------|----------------------|
| Subject group type          | Reporting group    | Reporting group | Subject analysis set | Subject analysis set |
| Number of subjects analysed | 158 <sup>[9]</sup> | 73              | 34                   | 122                  |
| Units: patients             |                    |                 |                      |                      |
| Missing                     | 5                  | 3               | 1                    | 2                    |
| Very bad                    | 3                  | 0               | 1                    | 2                    |
| Bad                         | 7                  | 3               | 1                    | 6                    |
| Average                     | 14                 | 6               | 5                    | 9                    |
| Good                        | 66                 | 23              | 16                   | 50                   |
| Very good                   | 63                 | 38              | 10                   | 53                   |

Notes:

[9] - Safety set for all treatment/analyses groups

## Statistical analyses

|                                         |                                                  |
|-----------------------------------------|--------------------------------------------------|
| <b>Statistical analysis title</b>       | Tolerability assessments by investigator; A vs B |
| Comparison groups                       | Group A v Group B                                |
| Number of subjects included in analysis | 231                                              |
| Analysis specification                  | Pre-specified                                    |
| Analysis type                           | non-inferiority                                  |
| P-value                                 | = 0.0923                                         |
| Method                                  | Wilcoxon (Mann-Whitney)                          |

|                                         |                                                    |
|-----------------------------------------|----------------------------------------------------|
| <b>Statistical analysis title</b>       | Tolerability assessments by investigator; A1 vs A2 |
| Comparison groups                       | Group A1 v Group A2                                |
| Number of subjects included in analysis | 156                                                |
| Analysis specification                  | Pre-specified                                      |
| Analysis type                           | non-inferiority                                    |
| P-value                                 | = 0.1454                                           |
| Method                                  | Wilcoxon (Mann-Whitney)                            |

## Secondary: 6\_Tolerability: Likert scale (Patient)

|                                                                                                                                                                                                |                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| End point title                                                                                                                                                                                | 6_Tolerability: Likert scale (Patient) |
| End point description:<br>Assessment of the overall tolerability by the patient using a 5-point Likert scale.<br>Likert scale score system: 1=Very bad; 2=Bad; 3=Average; 4=Good; 5=Very good. |                                        |
| Table below shows the number of patients in each tolerability category of the Likert scale, as assessed by the patient.                                                                        |                                        |
| End point type                                                                                                                                                                                 | Secondary                              |
| End point timeframe:<br>At the final visit/premature termination of the study.                                                                                                                 |                                        |

| End point values            | Group A             | Group B         | Group A1             | Group A2             |
|-----------------------------|---------------------|-----------------|----------------------|----------------------|
| Subject group type          | Reporting group     | Reporting group | Subject analysis set | Subject analysis set |
| Number of subjects analysed | 158 <sup>[10]</sup> | 73              | 34                   | 122                  |
| Units: patients             |                     |                 |                      |                      |
| Missing                     | 5                   | 3               | 1                    | 2                    |
| Very bad                    | 3                   | 0               | 2                    | 1                    |
| Bad                         | 6                   | 2               | 1                    | 5                    |
| Average                     | 14                  | 6               | 3                    | 11                   |
| Good                        | 71                  | 32              | 17                   | 54                   |
| Very good                   | 59                  | 30              | 10                   | 49                   |

Notes:

[10] - Safety set for all treatment/analyses groups

## Statistical analyses

|                                         |                                             |
|-----------------------------------------|---------------------------------------------|
| <b>Statistical analysis title</b>       | Tolerability assessments by patient; A vs B |
| Comparison groups                       | Group A v Group B                           |
| Number of subjects included in analysis | 231                                         |
| Analysis specification                  | Pre-specified                               |
| Analysis type                           | non-inferiority                             |
| P-value                                 | = 0.4214                                    |
| Method                                  | Wilcoxon (Mann-Whitney)                     |

|                                         |                                               |
|-----------------------------------------|-----------------------------------------------|
| <b>Statistical analysis title</b>       | Tolerability assessments by patient; A1 vs A2 |
| Comparison groups                       | Group A1 v Group A2                           |
| Number of subjects included in analysis | 156                                           |
| Analysis specification                  | Pre-specified                                 |
| Analysis type                           | non-inferiority                               |
| P-value                                 | = 0.2527                                      |
| Method                                  | Wilcoxon (Mann-Whitney)                       |

## Secondary: 7\_Treatment-emergent adverse event local reactions

|                 |                                                    |
|-----------------|----------------------------------------------------|
| End point title | 7_Treatment-emergent adverse event local reactions |
|-----------------|----------------------------------------------------|

End point description:

Treatment-emergent adverse event local reactions are represented by common symptoms of local reactions such as pain, tenderness, pruritus/itching, erythema/redness, in duration/swelling. The size for the symptoms erythema/redness and in duration/swelling was documented to allow adjustment of the dose accordingly. All injection site reactions > 5 cm (local reactions) had to be reported as AEs.

Most local reactions were considered mild or moderate in intensity; none were classified as serious AEs. Differences of local reactions between treatment groups were not statistically significant. All local reactions, except for 3 reactions were assessed as related to the IMP.

|                |           |
|----------------|-----------|
| End point type | Secondary |
|----------------|-----------|

End point timeframe:

Between the signature date of the ICF and the final visit, until approx. 30 days after the last IMP administration.

| End point values            | Group A             | Group B         | Group A1             | Group A2             |
|-----------------------------|---------------------|-----------------|----------------------|----------------------|
| Subject group type          | Reporting group     | Reporting group | Subject analysis set | Subject analysis set |
| Number of subjects analysed | 158 <sup>[11]</sup> | 73              | 34                   | 122                  |
| Units: patients             | 102                 | 40              | 20                   | 81                   |

Notes:

[11] - Safety set for all treatment/analyses groups

## Statistical analyses

|                                   |                                              |
|-----------------------------------|----------------------------------------------|
| <b>Statistical analysis title</b> | TEAE local reaction (Treatment Group A vs B) |
| Comparison groups                 | Group A v Group B                            |

|                                         |                 |
|-----------------------------------------|-----------------|
| Number of subjects included in analysis | 231             |
| Analysis specification                  | Pre-specified   |
| Analysis type                           | non-inferiority |
| P-value                                 | = 0.1907        |
| Method                                  | Fisher exact    |

|                                         |                                                |
|-----------------------------------------|------------------------------------------------|
| <b>Statistical analysis title</b>       | TEAE local reaction (Treatment Group A1 vs A2) |
| Comparison groups                       | Group A1 v Group A2                            |
| Number of subjects included in analysis | 156                                            |
| Analysis specification                  | Pre-specified                                  |
| Analysis type                           | non-inferiority                                |
| P-value                                 | = 0.4238                                       |
| Method                                  | Fisher exact                                   |

## Secondary: 8\_Vital signs - Heart rate

|                 |                            |
|-----------------|----------------------------|
| End point title | 8_Vital signs - Heart rate |
|-----------------|----------------------------|

End point description:

Clinical chemistry, vital signs, physical examination - are summarized as one representative endpoint. Shown is the heart rate, as change to baseline between screening (baseline) and the indicated study visit.

There were no relevant differences between the treatment groups or between the subgroups; same applies to laboratory parameters.

Vital signs measured:

Arterial BP, diastolic BP, heart rate, respiratory rate

Laboratory parameters:

- Clinical chemistry: creatinine, total bilirubin, aspartate aminotransferase, alanine aminotransferase, gamma-glutamyltransferase
- Blood sugar: glucose (fasting or nonfasting; status to be assessed only for determination of eligibility of the subject for the trial)
- Hematology: differential blood cell count, hemoglobin, leukocytes, platelets
- Urinalysis: protein, glucose, blood (hemoglobin), leukocytes, beta-human chorionic gonadotropin (women of childbearing potential only).

|                |           |
|----------------|-----------|
| End point type | Secondary |
|----------------|-----------|

End point timeframe:

Vital signs: screening (baseline), before and after each IMP administration, at dose escalation; and at the final/premature termination visit.

Laboratory parameters: screening (baseline) and at the final/premature termination visit.

| End point values              | Group A             | Group B            | Group A1             | Group A2             |
|-------------------------------|---------------------|--------------------|----------------------|----------------------|
| Subject group type            | Reporting group     | Reporting group    | Subject analysis set | Subject analysis set |
| Number of subjects analysed   | 158 <sup>[12]</sup> | 73 <sup>[13]</sup> | 34 <sup>[14]</sup>   | 122 <sup>[15]</sup>  |
| Units: bpm                    |                     |                    |                      |                      |
| median (full range (min-max)) |                     |                    |                      |                      |
| T1, after                     | -3 (-24 to 24)      | -2 (-23 to 8)      | -2 (-20 to 24)       | -4 (-24 to 11)       |
| T7, before                    | 0 (-29 to 25)       | 0 (-20 to 24)      | 1.5 (-29 to 19)      | -1 (-26 to 25)       |

|             |                 |                |                  |                |
|-------------|-----------------|----------------|------------------|----------------|
| T7, after   | -4 (-32 to 20)  | -1 (-26 to 23) | -4 (-27 to 20)   | -5 (-32 to 18) |
| T13, before | 4 (2 to 15)     | 20 (20 to 20)  | 4 (4 to 4)       | 4 (2 to 15)    |
| T13, after  | -2.5 (-12 to 3) | 16 (16 to 16)  | -12 (-12 to -12) | 2 (-7 to 3)    |
| Final Visit | 0 (-25 to 24)   | 1 (-22 to 29)  | 2 (-24 to 24)    | 0 (-25 to 24)  |

Notes:

[12] - Safety set

T1 aft=157

T7 bfr=151

T7 aft=151

T13 bfr=4

T13 aft=4

Final=153

[13] - Safety set

T1 aft=71

T7 bfr=68

T7 aft=67

T13 bfr=1

T13 aft=1

Final=70

[14] - Safety set

T1 aft=34

T7 bfr=32

T7 aft=32

T13 bfr=1

T13 aft=1

Final=33

[15] - Safety set

T1 aft=121

T7 bfr=119

T7 aft=119

T13 bfr=3

T13 aft=3

Final=120

## Statistical analyses

No statistical analyses for this end point

## Other pre-specified: 9\_Immunologic parameter (IgG4 for P. pratense)

|                 |                                                |
|-----------------|------------------------------------------------|
| End point title | 9_Immunologic parameter (IgG4 for P. pratense) |
|-----------------|------------------------------------------------|

End point description:

Changes in IgG4 were analyzed as an exploratory parameter. Increases in grass-pollen-specific IgG4 antibody concentrations provide valuable evidence for the immunogenic activity of the active preparations.

Mean change from baseline to the final visit in P. pratense IgG4 was similar between the treatment groups and is summarized in the table below.

|                |                     |
|----------------|---------------------|
| End point type | Other pre-specified |
|----------------|---------------------|

End point timeframe:

At screening (baseline) and the final visit/premature termination of the study.



| <b>End point values</b>       | Group A             | Group B            | Group A1             | Group A2             |
|-------------------------------|---------------------|--------------------|----------------------|----------------------|
| Subject group type            | Reporting group     | Reporting group    | Subject analysis set | Subject analysis set |
| Number of subjects analysed   | 152 <sup>[16]</sup> | 70                 | 33                   | 119                  |
| Units: mg/L                   |                     |                    |                      |                      |
| median (full range (min-max)) | 2.54 (0.0 to 29.1)  | 2.45 (0.1 to 23.7) | 1.80 (0.0 to 21.4)   | 2.60 (0.0 to 29.1)   |

Notes:

[16] - Safety set for all treatment/analyses groups

### Statistical analyses

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| <b>Statistical analysis title</b>       | IgG 4 level change to baseline (A vs B) |
| Comparison groups                       | Group A v Group B                       |
| Number of subjects included in analysis | 222                                     |
| Analysis specification                  | Pre-specified                           |
| Analysis type                           | non-inferiority                         |
| P-value                                 | = 0.9409                                |
| Method                                  | Wilcoxon (Mann-Whitney)                 |

|                                         |                                           |
|-----------------------------------------|-------------------------------------------|
| <b>Statistical analysis title</b>       | IgG 4 level change to baseline (A1 vs A2) |
| Comparison groups                       | Group A1 v Group A2                       |
| Number of subjects included in analysis | 152                                       |
| Analysis specification                  | Pre-specified                             |
| Analysis type                           | non-inferiority                           |
| P-value                                 | = 0.5237                                  |
| Method                                  | Wilcoxon (Mann-Whitney)                   |

## Adverse events

### Adverse events information

Timeframe for reporting adverse events:

Between the signature date of the ICF and the final visit, until approx. 30 days after the last IMP administration.

Adverse event reporting additional description:

AEs with an onset during or after the first IMP administration were defined as TEAEs. An AE was considered as related to the IMP/trial procedure if the causal relationship of the AE was recorded as having a reasonable possibility to the IMP/trial procedure in the eCRF. Fisher Exact tests were used to investigate treatment differences.

|                 |            |
|-----------------|------------|
| Assessment type | Systematic |
|-----------------|------------|

### Dictionary used

|                    |        |
|--------------------|--------|
| Dictionary name    | MedDRA |
| Dictionary version | 19.0   |

### Reporting groups

|                       |         |
|-----------------------|---------|
| Reporting group title | Group A |
|-----------------------|---------|

Reporting group description:

Subjects started treatment without any time constraints relative to the pollen season.

|                       |         |
|-----------------------|---------|
| Reporting group title | Group B |
|-----------------------|---------|

Reporting group description:

Subjects started treatment after the pollen season.

| Serious adverse events                            | Group A         | Group B        |  |
|---------------------------------------------------|-----------------|----------------|--|
| Total subjects affected by serious adverse events |                 |                |  |
| subjects affected / exposed                       | 1 / 158 (0.63%) | 0 / 73 (0.00%) |  |
| number of deaths (all causes)                     | 0               | 0              |  |
| number of deaths resulting from adverse events    | 0               | 0              |  |
| Cardiac disorders                                 |                 |                |  |
| Cardiovascular disorder                           |                 |                |  |
| subjects affected / exposed                       | 1 / 158 (0.63%) | 0 / 73 (0.00%) |  |
| occurrences causally related to treatment / all   | 0 / 1           | 0 / 0          |  |
| deaths causally related to treatment / all        | 0 / 0           | 0 / 0          |  |

Frequency threshold for reporting non-serious adverse events: 5 %

| Non-serious adverse events                            | Group A            | Group B          |  |
|-------------------------------------------------------|--------------------|------------------|--|
| Total subjects affected by non-serious adverse events |                    |                  |  |
| subjects affected / exposed                           | 127 / 158 (80.38%) | 54 / 73 (73.97%) |  |
| Nervous system disorders                              |                    |                  |  |

|                                                                                                                                     |                          |                        |  |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------|--|
| Headache<br>subjects affected / exposed<br>occurrences (all)                                                                        | 63 / 158 (39.87%)<br>153 | 23 / 73 (31.51%)<br>49 |  |
| General disorders and administration site conditions<br>Injection site erythema<br>subjects affected / exposed<br>occurrences (all) | 47 / 158 (29.75%)<br>122 | 17 / 73 (23.29%)<br>42 |  |
| Injection site pain<br>subjects affected / exposed<br>occurrences (all)                                                             | 19 / 158 (12.03%)<br>31  | 7 / 73 (9.59%)<br>15   |  |
| Injection site pruritus<br>subjects affected / exposed<br>occurrences (all)                                                         | 64 / 158 (40.51%)<br>168 | 32 / 73 (43.84%)<br>95 |  |
| Injection site swelling<br>subjects affected / exposed<br>occurrences (all)                                                         | 76 / 158 (48.10%)<br>223 | 26 / 73 (35.62%)<br>67 |  |
| Ear and labyrinth disorders<br>Vertigo<br>subjects affected / exposed<br>occurrences (all)                                          | 9 / 158 (5.70%)<br>14    | 1 / 73 (1.37%)<br>1    |  |
| Gastrointestinal disorders<br>Nausea<br>subjects affected / exposed<br>occurrences (all)                                            | 10 / 158 (6.33%)<br>13   | 0 / 73 (0.00%)<br>0    |  |
| Respiratory, thoracic and mediastinal disorders<br>Cough<br>subjects affected / exposed<br>occurrences (all)                        | 8 / 158 (5.06%)<br>10    | 0 / 73 (0.00%)<br>0    |  |
| Oropharyngeal pain<br>subjects affected / exposed<br>occurrences (all)                                                              | 13 / 158 (8.23%)<br>13   | 2 / 73 (2.74%)<br>2    |  |
| Infections and infestations<br>Nasopharyngitis<br>subjects affected / exposed<br>occurrences (all)                                  | 38 / 158 (24.05%)<br>56  | 22 / 73 (30.14%)<br>35 |  |



## More information

### Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

| Date            | Amendment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 30 October 2015 | <p>Planned sample size of treated subjects changed from 160 subjects in total, to 160 subjects in Group A and 80 subjects in Group B (a total of 240 subjects). Thus, the sample size calculation and justification were updated and the randomization ratio was changed from 1:1 to 2:1 (Group A: Group B).</p> <ul style="list-style-type: none"><li>• Evaluation of possible influence of antisymptomatic co-medication on year-round initiation of AIT was added as an objective and a corresponding safety endpoint was added.</li><li>• Exclusion of subjects using AIT for <math>\geq 4</math> weeks within the previous 5 years changed to any use of AIT within the previous 5 years.</li><li>• Receipt of a vaccination against viral or bacterial pathogens within 2 weeks before the start of the immunotherapy added as a restriction.</li><li>• Restriction of not using any short-acting antihistamines within 2 days changed to within 3 days.</li><li>• Restriction of not using any systemic anti-allergic medication within 2 days before and 1 day after IMP administration changed to within 3 days before, on the day, and 1 day after IMP administration.</li><li>• Requirement to record the size of any local reactions as longest diameter in cm added.</li><li>• Requirement to record all signs and symptoms leading to discomfort, as AE.</li></ul> |
| 03 May 2016     | <ul style="list-style-type: none"><li>• Clarification that vital signs could be measured after 5 minutes in either a supine or sitting position, not only supine.</li><li>• Criterion for withdrawal of subjects changed from a subject who experienced a reaction at the injection site following the first IMP administration which was considered severe to an injection site reaction following the first administration which required a dose modification.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Notes:

### Interruptions (globally)

Were there any global interruptions to the trial? No

### Limitations and caveats

None reported