Tab.1: Short description of all cohorts sorted by age included in the CHAMP consortium, for details see publication

Cohort	Numbers of children	Age group	Phenotype	Definition based on
PAULINA/ PAULCHEN(8)	283	Birth	Asthma/ Wheeze AD FA AR Healthy controls	Parent's reported doctor diagnosis
PASTURE/ ERFRAIM(32)	1133	birth, F/up 1yr, 4,5yr, 6yr, 10yr	Asthma/Wheeze AD FA AR Healthy controls	Parent's reported doctor diagnosis
KUNO Kids(33)	3600	Birth, 4yr	Asthma/Wheeze AD FA AR Healthy controls	Doctor diagnosis
Peanut Oral Immunotherapy (OIT =SOTI)(34)	63	4mths-18yrs	FA	Challenge-proven peanut allergy
Eczema & Food Allergy (EFA)	550	1-17yr	FA	Challenge-proven IgE-mediated (hen's egg and peanut)
Cross sectional asthma cohort(20)	335	4-17yr incl. 1yr and 3yr FU	Asthma/Wheeze AD FA AR Healthy controls	Doctor diagnosis
NIKI	138	6-12yrs	Asthma/Wheeze AD FA AR Healthy controls	Doctor diagnosis
German Asthma Net (GAN)(35)	299	6-17yrs	Severe allergic asthma	Doctor diagnosis
Study on Occupational Allergy Risk (SOLAR, FU of ISAAC)(36)	570	>10yrs	Asthma AD AR	Doctor diagnosis
followMAGICS	488	School age	Asthma AR	Doctor diagnosis

Tab. 2: Characteristics on DAAB survey participants (A) and their children (B) with respect to their allergic disease: p-values derived from Chi-Square-test

(A) Characteristics on Participant / Parent					
Number of allergies	none (N=355)	single one (N=190)	multiple (N=241)	Total (N=786)	p value
sex					0.09
female	341 (96.1%)	175 (92.1%)	223 (92.5%)	739 (94.0%)	
male	14 (3.9%)	15 (7.9%)	18 (7.5%)	47 (6.0%)	
age					0.336
20-29	15 (4.2%)	9 (4.7%)	11 (4.6%)	35 (4.5%)	
30-39	194 (54.6%)	99 (52.1%)	112 (46.5%)	405 (51.5%)	
40-49	133 (37.5%)	73 (38.4%)	100 (41.5%)	306 (38.9%)	
50-59	13 (3.7%)	8 (4.2%)	15 (6.2%)	36 (4.6%)	
over 60	0 (0.0%)	1 (0.5%)	3 (1.2%)	4 (0.5%)	
Allergic diseases of participant					
FA		20 (10.5%)	146 (60.6%)	166 (21.1%)	
AD		34 (17.9%)	123 (51.0%)	157 (20.0%)	
asthma		13 (6.8%)	135 (56.0%)	148 (18.8%)	
AR		123 (64.7%)	216 (89.6%)	339 (43.1%)	
Participant's family					
having a child with FA	324 (91.3%)	169 (88.9%)	199 (82.6%)	692 (88.0%)	0.005
having a child with AD	212 (59.7%)	127 (66.8%)	168 (69.7%)	507 (64.5%)	0.032
having a child with asthma	123 (34.6%)	80 (42.1%)	131 (54.4%)	334 (42.5%)	< 0.001
having a child with AR	156 (43.9%)	111 (58.4%)	158 (65.6%)	425 (54.1%)	< 0.001
(B) Characteristics on participant's children with allergies					
Number of allergies		single one (N=310)	multiple (N=727)	Total (N=1037)	p value
sex					0.004
female		144 (46.5%)	268 (36.9%)	412 (39.7%)	
male		166 (53.5%)	459 (63.1%)	625 (60.3%)	
age					0.006
first year of life		14 (4.5%)	15 (2.1%)	29 (2.8%)	
1-3 years		81 (26.1%)	133 (18.3%)	214 (20.6%)	
4-6 years		74 (23.9%)	192 (26.4%)	266	

				(25.7%)	
7-12 years		97 (31.3%)	286 (39.3%)	383 (36.9%)	
13-18 years		35 (11.3%)	74 (10.2%)	109 (10.5%)	
over 18 years		9 (2.9%)	27 (3.7%)	36 (3.5%)	
Children's allergic diseases					
FA		149 (48.1%)	625 (86.0%)	774 (74.6%)	< 0.001
AD		77 (24.8%)	528 (72.6%)	605 (58.3%)	< 0.001
asthma		26 (8.4%)	373 (51.3%)	399 (38.5%)	< 0.001
AR		58 (18.7%)	468 (64.4%)	526 (50.7%)	< 0.001

Table 3: The CHAMP study group: Project partners and description

Partners and subproject	Aim	Epidemiological or clinical cohorts	Phenotypes /questionnaire	Biosamples and analyses
SP1/3: B. Schaub, Munich – Coordination and Early priming of allergic disease: development of a novel molecular allergy risk score	Define subgroups of children at risk to develop allergic diseases	Ongoing recruitment and existing data of a cross sectional asthma study Existing data from two cordblood studies: PAULINA/PAULCHEN, PASTURE/EFRAIM (WP1)	Detailed socio-demographic data, health and environmental information from questionnaires	Genome-wide analysis for DNA, Epigenome and RNA Protein expression Cellular characterization Stool samples/ *S*kin swabs (microbiome composition) Allergic sensitization
SP2: W. Greiner/ S.Kreimeier, Bielefeld – Health-related quality of life (HRQoL) in children and adolescents with allergic diseases and quality of life (QoL) of their parents	Explore the influence of different allergic diseases on HRQoL of young patients and QoL of their parents	Joint effort. Recruitment from cohorts, in outpatient-clinics (SP3-SP6, planned N=1800) and by support of the DAAB	Generic and disease-specific HRQoL questionnaires for different age groups of patients, QoL questionnaire for parents, questions on allergic diseases, socio-demographic, environmental information	Comparison of patients' HRQoL, parents' QoL data between different allergic patient groups and subgroups (e.g. age groups, gender)
SP4: K. Beyer, Berlin - Natural resolution factors in tolerance development of food allergy	Identify „resolution factors" involved in natural and therapeutically induced tolerance development in already established food allergy	SOTI N= 42 EFA N= 172	FA: Study physician diagnosed IgE-mediated food allergy using allergen-specific IgE measurement and oral food challenges (usually double-blind) over time AD: Study physician diagnosed eczema based on the modified criteria of Hanifin and Rajka, Questionnaires: socio-demographic data and health information;	EDTA blood for DNA, RNA Cells for chip-cytometry and cytokine determination in cell culture supernatants Serum/plasma/saliva for immuneglobulin and chemokine determination Stool samples/ *S*kin swabs (microbiome composition) House and bed dust for determination of food allergens

SP5: E. Hamelmann, Bielefeld - Severity and co-morbidities of allergic diseases	Identify the mechanisms leading to progression of allergic diseases to more severe allergic subtypes	GAN (ongoing, additional recruitment of severe asthmatics from SP3 and SP6) N= 24 (planned 60) NIKI (closed) N= 138	Clinical information (E-data bank)	DNA for genetics and epigenetics, whole blood for RNA sequencing, faeces and nasopharyngeal swabs for microbiota Metabolic diagnostic (ADMA/ NO-Parameter), Cytokine, IgE
SP6: M. Kabesch, Regensburg - Systematic detection of mechanisms & markers for allergy remission in children & adolescents	Identify and characterize the mechanisms of asthma and allergy remission either spontaneously or after immunotherapy in late childhood and adolescence	Children with atopic diseases from outpatient clinics and participants of the KUNO Kids health study going into remission will be evaluated for markers and predictors for remission Replication populations: followMAGICS and SOLAR	Detailed disease data and health status information from questionnaires	Genetics: GWAS Epigenetics: Infinium Human Methylation EPIC BeadChip (Illumina) Transcriptomics: RNA seq Microbiome:16S pyrosequencing analysis Metabolomics: MaxP Quant 500 Kit (BIOCRATES Life Sciences).
SP7: E. von Mutius/M. Depner, Munich - Analyses and integration of microbiome data from allergy cohorts	Understand the role of the microbiome in the context of progression or remission of allergic diseases	This study is a cooperated effort. Participants will be recruited from specific cohorts out of SP3-SP6, more specifically:	Allergic diseases will be defined by a study physician in the respective cohorts Additional variables will be developed based on questionnaire data and/or measured parameters e.g. tests for lung function or specific IgE for better comparision of phenotypes	Microbiome 16S rRNA from the respective sub-projects on different sites (throat for AA, skin for FA, and faeces for all)
SP8: G. Hansen, Hannover - Perinatal priming of tolerance and allergy	Assess underlying mechanisms of allergy development with focus on early tolerance induction	Not applicable	Murine models of Allergic Asthma, Food allergy, and Atopic Dermatitis; Influence of microbial stimulation; Influence of the inflammasome NLRP3; Strains: C57BL/6J and B6.129S6-Nlrp3tm1Bhk/J mice	Allergic sensitization and tolerization models (Ovalbumin) Lung function Gene expression Protein expression Histology Flow cytometry Cellular characterization

DAAB – Patient Involvement: allergic diseases from a patient point of view	Develop and carry out a survey to allergic children and their parents with emphasis on the personal needs and requirements of the families	N = 599 DAAB members N = 251 DAAB non-members	socio-demographic data, information about diff. allergic diseases from questionnaires	Comparison between members and non-members