Tab. 1: 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 (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 2: The CHAMP study group: Project partners and description

Partners and subproject	Aim	Epidemiological or clinical cohorts	Phenotypes /questionnaire	Biosamples and analyses	Current status
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 is ongoing from cohorts, outpatient-clinics (SP3-SP6, planned N=1800) and supported by the DAAB	Generic and disease-specific HRQoL question-naires for different age groups of patients, QoL questionnaire for parents including questions on allergic diseases, socio-demographic, environ-mental information. Baseline assessment plus a one- and two-year follow-up	Comparison of patients' HRQoL, parents' QoL data between different allergic patient groups and subgroups (e.g. age groups, gender)	Baseline data are analyzed. In the first phase of SP2, an adaption of a disease-specific HRQoL questionnaire for children suffering from AA and AR for the German context was established
SP3: 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	Two cordblood studies: PAULINA/PAULCHEN, n=283 and PASTURE/EFRAIM, n=1133 Cross sectional asthma study, n=335	Doctor"s diagnosis of asthma Parent"s reported diagno-sis of asthma, AD, FA, AR and detailed sociodemo-graphic data, health and environmental information from questionnaires on all cohorts	Genome-wide analysis for DNA, Epigenome and RNA Protein expression Cellular characterization Stool samples/ *S*kin swabs (microbiome composition) Allergic sensitization	Differences between healthy and allergic children by a combination of genome-wide genetics, epigenetic variability and gene expression in two birth cohorts are assessed.
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	Peanut Oral Immunotherapy (OIT =SOTI) n= 42 (total 63) Eczema & Food Allergy (EFA) n= 172 (total 550)	FA: Study physician diagnosed IgE-mediated food allergy using allergen-specific IgE measurement and oral food challenges 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	192 patients are already enrolled for "induced tolerance development" in peanut allergic versus "natural tolerance development" in peanut- and/or hen's- egg-allergic, while analyses of bio samples and clinical data will take place in parallel to ongoing enrolement.

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	German Asthma Net (GAN) with ongoing and additional recruitment of severe asthmatics from SP3 and SP6), n= 24 (planned 60) NIKI, n= 138	Doctor's diagnosis Clinical information (E-data base)	DNA for genetics and epigenetics, whole blood for RNA sequencing, faeces and nasopharyngeal swabs for microbiota Metabolic diagnostic (ADMA/ NO-Parameter), Cytokine, IgE	Patients and data of the German Asthma Network (GAN) register are utilized. Within the NIKI-Cohort, children with asthma and comorbidities such as obesity and attention deficit hyperactivity disorder are compared regarding underlying mechanisms
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 fom the KUNO Kids health study (n=3600) Replication populations: Follow-MAGICS (n=577) and SOLAR (n=480)	Doctor's diagnosis Detailed disease data and health status information from questionnaires	Genetics: GWAS Epigenetics: Infinium Human Methylation EPIC BeadChip Transcriptomics: RNA seq Microbiome:16S Pyrosequencing analysis Metabolomics: MaxP Quant 500 Kit (BIOCRATES Life Sciences).	Collecting samples of children and adolescents with atopic asthma, AR and/ or AD to acquire a comprehensive picture of biological processes from before and 6 months after start of remission.
SP7: E. von Mutius/ M. Depner, Munich - Analysis 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.	Diagnosis as described in the respective cohorts, 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)	Microbiome data from distinct allergy cohorts and different allergic diseases (SP7) sites are characterized with respect to main bacteria species and diversity.
SP8: G. Hansen, Hannover - Perinatal priming of tolerance and allergy	Assess underlying mechanisms of allergy development with focus on early tolerance induction	Not applicable Findings from the cohorts are tested in the models and vice versa.	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 (Oval-bumin) with lung function, gene expression, protein expression, histology, flow cytometry and cellular characterization	Results revealed hitherto unknown regulatory mechanisms for NLRP3 in maternal tolerance induction and protection from allergic diseases, involving both the innate and adaptive immune system.

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	See this publication for results