

SUPPLEMENTARY MATERIAL

Supplementary Table 1.A: Healthy Controls

Subject		2	5	6	7	8	9	15	16	18	19	26	27	28	29	30	31	49
Sex		F	F	M	M	M	F	F	F	F	M	F	F	F	F	F	F	M
Age		58	52	31	51	64	34	57	47	64	45	32	48	53	33	63	27	31
sIgE (kU/L)	<i>Apis mellifera</i>	0.01	0.01	0.06	0.69	0.01	0.03	0.01	0.01	0.02	0.01	0	0.01	0	0.01	0.01	0.07	0
	rApi m 1	0	0	1.79	0.27	0	0.1	0.01	0	0.09	0.01	0	0	0	0	0	0	0
	rApi m 2	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0
	rApi m 3	0	0	0	0.1	0	0.01	0	0	0	0	0	0	0	0	0	0	0
	Api m 4	0	0	0	0.06	0	0.01	0	0	0	0	0.02	0.01	0	0	0.01	0	0.01
	rApi m 5	0	0	0.01	3.69	0.02	0.02	0	0	0.01	0.01	0	0	0	0	0	0	0
	rApi m 10	0.01	0	0.02	0.17	0.02	0.02	0	0	0	0.01	0	0	0	0	0.01	0	0
sIgG4 (mg/L)	<i>Apis mellifera</i>	0.117	0.000	0.023	0.045	0.099	0.006	0.024	1.178	0.019	0.044	0.026	0.016	0.006	0.007	0.015	0.052	0.000
	rApi m 1	0.006	0.000	0.132	0.008	0.022	0.011	0.074	0.042	0.038	0.085	0.036	0.017	0.000	0.000	0.005	0.005	0.000
	rApi m 2	0.005	0.000	0.000	0.019	0.012	0.000	0.010	0.018	0.008	0.026	0.016	0.006	0.000	0.000	0.000	0.001	0.000
	rApi m 3	0.013	0.000	0.013	0.013	0.020	0.000	0.010	0.016	0.011	0.024	0.026	0.010	0.000	0.000	0.001	0.000	0.000
	Api m 4	0.158	0.242	0.026	0.126	0.036	0.223	0.018	0.049	0.024	0.057	0.036	0.014	0.000	0.000	0.000	0.000	0.000
	rApi m 5	0.047	0.013	0.031	0.077	0.053	0.000	0.033	0.049	0.025	0.046	0.030	0.014	0.002	0.005	0.014	0.018	0.006
	rApi m 10	0.028	0.000	0.018	0.019	0.036	0.005	0.016	0.033	0.013	0.043	0.056	0.018	0.002	0.011	0.015	0.000	0.000
BAT (%)	CD63+ (0.1 µg/mL)	0.7	1.3	4.6	1.5	1.6	1.1	0.4	2.8	0	0.2	0.4	1.4	0.5	0.4	0.6	0.3	0.1
	CD63+ (1 µg/mL)	0.5	1.6	2.5	1.2	0.7	2.2	1	2.3	0.1	0.4	1.3	0.4	1.1	0.2	1.7	0.4	0.4
T-helper subpopulations (%)	Th1 (0.1 µg/mL)	15	11.6	8.3	15.5	9.3	8.2	16.8	17	11.8	15.9	20.6	1.6	10.5	10.9	7.8	18.3	2.5
	Th2 (0.1 µg/mL)	0.5	0.5	0	0.3	0.9	0.6	0.8	1.5	2	1.8	1.5	0.1	1.7	0.7	0.4	0.6	0
	Th17 (0.1 µg/mL)	1.5	1.7	0.2	0.1	0.7	1.2	0.8	1	0.9	0.8	0.9	0.9	0.7	0.9	0.5	0.9	0.6
	Th1 (1 µg/mL)	15.5	11.7	4.4	3.7	10.3	8.6	20.5	23.7	11.9	8	17.1	23.3	11.4	13.8	9.4	16.6	2.6
	Th2 (1 µg/mL)	0.7	0.2	0.2	0.1	0.9	0.3	0.7	2.2	1.9	0.1	0.9	0.8	1	0.8	0.6	0.3	0
T-reg (%)	CTLA-4+	12	13.2	11.3	23.2	7.7	0.6	3	4.2	46.7	50.6	18.6	14.7	15.6	19	13.7	20.2	6.9
	Helios-	52.5	47.4	41.2	39.2	65	56	51.6	42.3	74.9	83.4	92.7	89.4	89.2	89.3	94.3	90.9	93.3
Interleukins (pg/mL)	IL-4	145.156	145.345	169.543	778.739	104.876	n.d.	471.606	362.3	504.373	528.373	212.995	179.806	524.807	488.796	244.403	173.452	60.576
	IL-10	10.457	59.071	45.285	32.027	37.823	n.d.	26.957	3.26	4.11	11.076	21.645	87.882	59.761	98.353	27.289	31.111	26.623

sIgE: specific IgE; sIgG4: specific IgG4. Atopy was defined as aeroallergen or food sensitization. M: Male; F: Female. BAT: Basophil Activation Test. T-reg: T regulatory cells.

Supplementary Table 1.B: Allergic Patients

Subject	3	10	11	12	13	14	17	20	21	23	24	45	46	47	48	50	51	52	53	54	
Sex	F	M	M	M	M	F	M	F	F	M	M	M	F	M	M	M	M	M	M	M	
Age	52	65	49	43	28	25	46	68	41	30	18	51	54	32	21	32	48	40	39	26	
Exposure	BEEKEEPER	BUILDER	TRUCK DRIVE	HARVESTER	BEEKEEPER	BEEKEEPER	BEEKEEPER	RETIRED	BEEKEEPER	BEEKEEPER	BEEKEEPER	BEEKEEPER	TEACHER	HARVESTER	BEEKEEPER	BEEKEEPER	BEEKEEPER	BEEKEEPER	SEALER	HARVESTER	
Exposition time (years)	>10	>10	-	>10	5 to 10	5 to 10	>10	-	>10	>10	<5	>10	-	-	<5	5 to 10	>10	>10	-	5 to 10	
Atopy	NO	NO	NO	YES	NO	NO	YES	YES	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	
Anaphylaxis	Grade 3	Grade 3	Grade 2	Grade 3	Grade 3	Grade 2	Grade 3	Grade 3	Grade 2	Grade 3	Grade 3	Grade 2	Grade 2	Grade 3	Grade 3	Grade 2	Grade 3	Grade 3	Grade 2	Grade 3	
REMA score	<2	<2	<2	>2	<2	<2	<2	<2	<2	>2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
slgE (kU/L)	<i>Apis mellifera</i>	36.5	11.7	6.96	0.29	6.75	3.48	7.98	0.37	0.54	0.24	238	0.22	8.4	27.1	16	24.6	1.16	5.88	57.8	8.09
	rApi m 1	36.7	3.31	2.19	0.2	0.63	4.18	0	0.48	0.65	0	88.9	0.16	0.37	4.59	0.09	3.76	0.66	1.55	54.8	0.67
	rApi m 2	0	0	6.12	0	0	0	0	0	0	0	2.56	0	0	0.03	0	0.16	0	0.03	0	2.59
	rApi m 3	0	0.25	0	0	0.17	0	4.66	0	0	0	10.8	0	0	0.02	0.01	4.8	0.06	0.01	0.24	0.07
	rApi m 4	0.18	0.1	0.09	0	0.21	0.16	0.06	0	0	0	2.62	0.02	0.39	5.96	4.23	1.99	0.05	0.3	0.46	0.1
	rApi m 5	0	0.78	0.01	0	1.45	0.07	0.84	0	0	0	11.6	0.01	2.03	0.23	0.42	15.5	0	0.95	0.56	12.3
	rApi m 10	0	7.52	1.66	0	0.28	0.2	20.6	0	0.04	0.86	1.54	0.01	0.15	32.3	2.18	125	0	5.8	0.4	37.6
slgG4 (mg/L)	<i>Apis mellifera</i>	0.286	4.481	0.087	0.020	0.161	0.007	0.176	0.112	0.027	0.000	0.899	0.002	0.501	1.315	0.192	0.996	1.406	0.091	0.217	1.340
	rApi m 1	0.300	4.267	0.041	0.006	0.040	0.017	0.041	0.192	0.077	0.010	0.767	0.021	0.026	2.017	0.025	0.062	0.896	0.035	0.251	0.315
	rApi m 2	0.000	0.069	0.047	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.146
	rApi m 3	0.000	0.673	0.000	0.024	0.000	0.000	0.018	0.000	0.000	0.001	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
	rApi m 4	0.012	0.766	0.015	0.021	0.025	0.002	0.050	0.022	0.024	0.012	0.041	0.105	0.124	0.319	0.025	0.028	0.154	0.027	0.031	0.052
	rApi m 5	0.007	0.067	0.016	0.041	0.027	0.012	0.035	0.022	0.022	0.014	0.010	0.005	0.000	0.004	0.014	0.030	0.014	0.054	0.022	0.012
	rApi m 10	0.015	0.120	0.025	0.046	0.001	0.000	0.000	0.000	0.000	0.000	0.004	0.001	0.013	0.055	0.015	0.028	0.011	0.012	0.026	0.006
BAT (%)	CD63+ (0.1 µg/mL)	1.9	1.7	0	0.8	0	17.5	6.4	0.2	0.7	1.7	7.6	0.6	0.2	45.4	1.7	7.3	0	6.7	3.1	1.9
	CD63+ (1 µg/mL)	5.8	64.5	5	70.2	65.5	55.2	72.3	60.1	65.7	3.1	78.6	39.9	5.4	77.8	64.2	62.5	68.7	89.6	85.6	54.4
T-helper subpopulations (%)	Th1 (0.1 µg/mL)	11.1	20.2	11	8.1	10.3	12.3	20.2	26.5	10.4	8.3	3.6	19.1	11.8	1.2	1	2.8	6.7	10.4	8.2	23.9
	Th2 (0.1 µg/mL)	0.2	0.9	1.1	0.5	1	0.4	1.2	2.4	0.4	0.8	1.2	1.4	0.9	0.1	0.1	0	0.1	1.5	0.4	3.8
	Th17 (0.1 µg/mL)	0.3	2.1	1.2	0.8	0.6	0.9	0.6	0.8	0.8	1.9	0.5	0.9	0.8	0	0.1	0.3	0.1	0.7	0.3	1.1
	Th1 (1 µg/mL)	17	24.2	11.1	11.7	10.4	14.2	24.7	29.5	8.3	7.9	6	20.5	10.9	2	0.5	4.5	5	8.4	5	19.7
	Th2 (1 µg/mL)	0.7	1.4	0.9	0.6	0.5	0.5	1.1	2.7	0.4	0.5	1.1	1.1	0.8	0	0	0	0	0.8	0.4	2.8
Th17 (1 µg/mL)	1	2.4	1.1	1.1	0.5	1.3	1.2	1	0.8	1.9	0.8	1.1	1.1	0.1	0.1	0.3	0.1	0.3	0.1	0.8	
T-reg (%)	CTLA-4+	0	0.4	2.2	14.7	0	17.7	5.9	10.6	31.8	5	32	24	30.2	12.7	7.5	3.4	2.4	18.2	16.7	9.6
	Helios-	54.7	38.4	71	46	46.6	94.7	87	79.6	81.9	82.4	83.4	90.7	94.9	87.3	49.7	37	74.7	67.9	73.4	56.6
Interleukins (pg/mL)	IL-4	n.d.	n.d.	n.d.	277.41	248.057	320.453	325.612	699.852	181.293	300.018	441.856	288.042	202.466	83.804	165.059	142.104	437.619	374.827	331.741	1866.745
	IL-10	n.d.	n.d.	n.d.	16	30.181	18.031	5.793	23.495	33.818	24.210	32.027	64.736	6.755	14.353	41.097	19.69	6.69	9.27	9.8	17.18
Tryptase (µg/L)	4.18	4.59	3.29	8.79	3.92	3.15	5.98	4.88	1.74	10.2	2.37	4.97	4.76	5.46	10	2.94	4	4.65	2	3.23	

slgE: specific IgE; slgG4: specific IgG4. Atopy was defined as aeroallergen or food sensitization. M: Male; F: Female. BAT: Basophil Activation Test. T-reg: T regulatory cells.

Supplementary Table 1.C: Tolerant Beekeepers

Subject		1	4	22	25	32	33	34	35	36	37	38	39	40	41	42	43	44
Sex		M	M	M	F	M	M	M	M	F	M	M	M	F	M	M	M	F
Age		52	65	49	43	28	25	46	68	41	30	18	51	54	32	21	32	48
Stings per year		>200	>200	>200	50	>200	>200	>200	50	>200	>200	>200	>200	>200	>200	>200	50	50
Atopy		Yes	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No
sIgE (kU/L)	<i>Apis mellifera</i>	0.21	0.18	0.94	7.86	0.25	1.33	0.48	1.83	0.28	1.33	1.27	1.67	0.61	0.61	0.24	0.67	4.74
	rApi m 1	0.05	0.02	0.23	0.74	0.11	0.13	0.18	0.74	0.10	0.18	0.39	0.68	0.09	0.24	0.08	1.01	0.09
	rApi m 2	0.18	0.13	0.34	1.48	0.00	1.35	0.13	0.52	0.16	0.37	0.24	0.64	0.25	0.65	0.15	0.18	0.20
	rApi m 3	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.74	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.02
	Api m 4	0.01	0.03	0.05	0.05	0.01	0.04	0.03	0.08	0.02	0.10	0.07	0.05	0.24	0.01	0.01	0.02	0.46
	rApi m 5	0.03	0.14	0.07	0.00	0.03	0.00	0.01	0.00	0.00	0.26	0.12	0.12	0.18	0.05	0.00	0.17	0.32
	rApi m 10	0.12	0.00	0.72	1.08	0.09	0.12	0.01	0.41	0.00	0.05	0.06	1.27	0.04	0.15	0.00	0.11	1.60
sIgG4 (mg/L)	<i>Apis mellifera</i>	21.000	18.943	21.980	5.374	27.872	13.442	24.582	2.742	17.130	23.389	29.430	3.689	27.307	29.587	21.387	15.003	0.663
	rApi m 1	20.547	13.570	12.741	2.860	17.973	4.155	18.131	2.737	9.692	20.909	24.914	2.381	17.670	20.930	18.043	11.471	0.009
	rApi m 2	6.645	3.767	9.737	1.383	9.252	5.174	3.740	0.555	4.689	8.582	9.775	0.021	3.220	9.915	16.866	2.649	0.009
	rApi m 3	1.173	1.537	4.836	0.027	0.463	0.004	0.839	0.010	0.340	0.749	2.398	0.000	1.097	0.291	0.830	0.136	0.000
	Api m 4	13.731	3.935	16.245	0.455	19.354	4.338	4.393	0.470	6.233	12.702	8.047	1.244	16.514	5.839	15.886	2.082	0.142
	rApi m 5	1.444	1.032	5.951	0.017	0.924	0.084	0.958	0.008	0.224	1.622	1.168	0.007	2.889	0.556	0.744	0.797	0.010
	rApi m 10	1.194	1.621	1.669	0.022	2.890	0.117	1.097	0.034	0.875	1.482	3.576	0.061	0.987	1.470	0.187	0.055	0.124
BAT (%)	CD63+ (0.1 µg/mL)	0.7	0.9	0.5	0	1.7	0.4	0.6	0	0	0.9	0.8	0	0.5	1	0.2	0.5	2.6
	CD63+ (1 µg/mL)	0.7	1	4.5	28.3	0.4	18.2	0.9	56.9	0	0.8	17.2	9.1	34.3	1.5	0.4	24.2	67.2
T-helper subpopulations (%)	Th1 (0.1 µg/mL)	4.8	4.8	7.9	6.7	8.8	2.6	2.2	5.4	3.5	8.4	8.6	5.6	3.1	2.2	1.9	3.9	14
	Th2 (0.1 µg/mL)	0.4	0.3	0.2	0.2	1.3	0	0	0.1	0	0.6	0.2	0.2	0.2	0.1	0.1	0.1	0.4
	Th17 (0.1 µg/mL)	0.8	0.7	0.6	0.6	0.4	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.3
	Th1 (1 µg/mL)	3.7	6.6	7.8	9.9	13.3	2.5	2.2	4.9	4.3	10.5	8.9	6	6.1	2	2	12.8	12.9
	Th2 (1 µg/mL)	0.2	0.2	0.1	0.7	2.8	0	0	0	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.4	0.4
Th17 (1 µg/mL)	0.7	1	0.7	1	0.9	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.5	0.2	
T-reg (%)	CTLA-4+	13.4	1	20.9	16.9	29.2	37.6	39.1	32	50.8	28.4	20.5	32.9	25.8	13.9	24.3	32	37.3
	Helios-	62.7	94.1	76.7	61.1	88	82.4	80.4	88.9	91.5	94.5	77.8	92.5	91	96.1	95.8	98	98.6
Interleukins (pg/mL)	IL-4	128.522	n.d.	216.357	421.551	272.709	119.057	394.516	120.827	175.304	683.273	466.935	149.834	201.369	95.311	148.907	433.301	243.963
	IL-10	11.076	n.d.	58.379	41.365	78.147	37.264	103.695	25.947	72.186	82.326	74.971	30.803	118.275	44.255	56.048	59.302	5.130

sIgE: specific IgE; sIgG4: specific IgG4. Atopy was defined as aeroallergen or food sensitization. M: Male; F: Female. BAT: Basophil Activation Test. T-reg: T regulatory cells.