1. Appendix (Supplemental Material)

Table S1: Results from PERMANOVA and ANOSIM analysis of one-week-old F1-juveniles per functional gene categories. Multivariate ANOSIM was performed following significant PERMANOVA effect to assess differences in the gene expression profiles per treatment groups applying pairwise comparison on relative gene expression data (−ΔCt-values) based on a Bray-Curtis distance matrix and 999 permutations. Pairwise comparison was conducted for following fixed factors and their interaction: F0-bacteria treatment effect (parental control (F0N), parental *Vibrio* (F0V+) vs *Tenacibaculum* (F0T+)), F0-sex´ (maternal (F0Mat), paternal (F0Pat) vs control (F0N)) and \`F1-bacteria´ (F1-offspring control (F1N), F1-offspring *Vibrio* (F1V+) and *Tenacibaculum* (F1T+)).

One week-old	Immune genes (29)	Innate genes (13)	Innate & Adaptive genes (5)	Adaptive genes (8)	Complement component genes (3)	Epigenetic genes (15)	DNA-methylation genes (5)	Histone de/methylation genes (4)	Histone de/acetylation genes (5)
F0-bacteria	<0.001***	<0.001***	<0.001***	0.026*	<0.001***	<0.001***	0.002**	<0.001***	<0.001***
Global R	0.108	0.110	0.033	0.076	0.038	0.006	0.005	0.006	0.001
Significance level	0.001	0.001	0.001	0.001	0.001	0.308	0.328	0.304	0.133
Groups									
F0V+, F0T+	0.001	0.001	0.001	0.001	0.001	0.01	0.002	0.04	0.05
F0V+, F0N	0.002	0.001	ns	0.003	0.006	ns	ns	ns	ns
F0T+, F0N	0.001	0.001	ns	ns	Ns	ns	ns	ns	ns
F0-sex	<0.001***	<0.001***	<0.001***	0.026*	<0.001***	<0.001***	0.002**	<0.001***	<0.001***
ANOSIM-Global R	0.052	0.071	0.011	0.025	0.016	0.006	0.010	0.050	0.019
Significance level	0.001	0.001	0.190	0.016	0.070	0.290	0.169	0.001	0.003
Groups									
F0Mat, F0Pat	0.001	0.003	0.001	0.003	ns	0.005	0.001	0.018	0.036
F0Mat, F0N	ns	0.001	ns	ns	ns	ns	ns	ns	ns
F0Pat, F0N	0.002	0.001	ns	0.046	0.041	ns	ns	ns	0.036
F1-bacteria	<0.001***	<0.001***	<0.001***	ns	<0.001***	<0.001***	0.036*	0.002**	<0.001***
ANOSIM-Global R	0.058	0.043	0.038		0.073	0.014	0.012	0.002	0.017
Significance level	0.001	0.001	0.001		0.001	0.001	0.001	0.268	0.004
Groups									
F1V+, F1T+	ns	ns	ns		ns	ns	ns	ns	ns
F1V+, F1N	0.001	0.001	0.001		0.001	0.009	0.007	0.008	0.005
F1T+, F1N	0.001	0.001	0.001		0.001	0.005	0.008	0.004	0.001
F0-bacteria x F1-bacteria	ns	ns	ns	ns	ns	ns	ns	ns	0.006**
ANOSIM-Global R									0.024
Significance level									0.160
Groups									
F0V+/F1V+, F0V+/F1T+									ns
F0V+/F1V+, F0V+/F1N									0.019

F0V+/F1V+, F0T+/F1V+									ns
F0V+/F1V+, F0T+/F1T+									ns
F0V+/F1V+, F0T+/F1N									ns
F0V+/F1V+, F0N/F1V+									ns
F0V+/F1V+, F0N/F1T+									ns
F0V+/F1V+, F0N/F1N									ns
F0V+/F1T+, F0V+/F1N									0.01
F0V+/F1T+, F0T+/F1V+									ns
F0V+/F1T+, F0T+/F1T+									ns
F0V+/F1T+, F0T+/F1N									ns
F0V+/F1T+, F0N/F1V+									ns
F0V+/F1T+, F0N/F1T+									0.028
F0V+/F1T+, F0N/F1N									0.046
F0V+/F1N, F0T+/F1V+									ns
F0V+/F1N, F0T+/F1T+									0.044
F0V+/F1N, F0T+/F1N									ns
F0V+/F1N, F0N/F1V+									ns
F0V+/F1N, F0N/F1T+									0.043
F0V+/F1N, F0N/F1N									ns
F0T+/F1V+, F0T+/F1T+									ns
F0T+/F1V+, F0T+/F1N									ns
F0T+/F1V+, F0N/F1V+									ns
F0T+/F1V+, F0N/F1T+									ns
F0T+/F1V+, F0N/F1N									ns
F0T+/F1T+, F0T+/F1N									ns
F0T+/F1T+, F0N/F1V+									ns
F0T+/F1T+, F0N/F1T+									ns
F0T+/F1T+, F0N/F1N									ns
F0T+/F1N, F0N/F1V+									ns
F0T+/F1N, F0N/F1T+									0.033
F0T+/F1N, F0N/F1N									ns
F0N/F1V+, F0N/F1T+									ns
F0N/F1V+, F0N/F1N									ns
F0N/F1T+, F0N/F1N									ns
F0-sex x F1-bacteria	0.002**	0.003**	ns	ns	0.004*	0.003**	0.008**	0.005**	ns
ANOSIM-Global R	0.082	0.090			0.076	0.026	0.027	0.022	
Significance level	0.001	0.001			0.001	0.001	0.004	0.003	
Groups									
F0Mat/F1V+, F0Mat/F1T+	ns	ns			ns	ns	ns	ns	
F0Mat/F1V+, F0Mat/F1N	0.001	0.001			0.001	0.03	ns	0.017	
F0Mat/F1V+, F0Pat/F1V+	0.008	0.01			ns	ns	0.024	ns	
F0Mat/F1V+, F0Pat/F1T+	0.009	0.021			ns	0.004	0.003	0.002	
F0Mat/F1V+, F0Pat/F1N	0.001	0.001			0.001	0.165	ns	ns	
F0Mat/F1V+, F0N/F1V+	ns	0.005			ns	ns	ns	ns	
F0Mat/F1V+, F0N/F1T+	ns	0.015			ns	ns	ns	ns	
F0Mat/F1V+, F0N/F1N	ns	0.029			0.002	ns	ns	ns	
F0Mat/F1T+, F0Mat/F1N	0.001	0.001			0.001	0.009	0.059	0.007	
F0Mat/F1T+, F0Pat/F1V+	0.01	0.017			0.026	0.042	0.003	0.031	
F0Mat/F1T+, F0Pat/F1T+	0.001	0.012			ns	0.001	0.001	0.001	

F0Mat/F1T+, F0Pat/F1N	**0.001**	**0.001**			**0.001**	**0.028**	**0.089**	**0.038**	
F0Mat/F1T+, F0N/F1V+	ns	**0.003**			ns	ns	ns	ns	
F0Mat/F1T+, F0N/F1T+	ns	**0.008**			**0.015**	ns	ns	ns	
F0Mat/F1T+, F0N/F1N	**0.024**	ns			**0.001**	ns	ns	ns	
F0Mat/F1N, F0Pat/F1V+	**0.001**	**0.001**			**0.004**	**0.025**	**0.037**	ns	
F0Mat/F1N, F0Pat/F1T+	**0.001**	**0.001**			**0.001**	**0.015**	**0.011**	ns	
F0Mat/F1N, F0Pat/F1N	ns	ns			**0.014**	ns	**0.046**	ns	
F0Mat/F1N, F0N/F1V+	**0.001**	**0.001**			**0.013**	ns	ns	ns	
F0Mat/F1N, F0N/F1T+	**0.004**	**0.001**			**0.003**	ns	ns	ns	
F0Mat/F1N, F0N/F1N	ns	**0.052**			ns	ns	ns	ns	
F0Pat/F1V+, F0Pat/F1T+	ns	ns			ns	ns	ns	ns	
F0Pat/F1V+, F0Pat/F1N	**0.02**	**0.006**			ns	**0.056**	**0.013**	ns	
F0Pat/F1V+, F0N/F1V+	ns	**0.013**			ns	**ns**	ns	**0.026**	
F0Pat/F1V+, F0N/F1T+	ns	**0.019**			ns	**ns**	ns	ns	
F0Pat/F1V+, F0N/F1N	**0.041**	**0.026**			ns	**ns**	**0.03**	**ns**	
F0Pat/F1T+, F0Pat/F1N	**0.001**	**0.003**			**0.009**	**0.005**	**0.008**	**0.044**	
F0Pat/F1T+, F0N/F1V+	**0.012**	**0.003**			ns	ns	**ns**	ns	
F0Pat/F1T+, F0N/F1T+	**0.011**	**0.004**			**0.03**	ns	**ns**	ns	
F0Pat/F1T+, F0N/F1N	**0.005**	**0.007**			**0.007**	ns	**0.003**	ns	
F0Pat/F1N, F0N/F1V+	**0.001**	**0.001**			ns	ns	ns	ns	
F0Pat/F1N, F0N/F1T+	**0.001**	**0.001**			**0.035**	ns	ns	ns	
F0Pat/F1N, F0N/F1N	ns	ns			ns	ns	ns	ns	
F0N/F1V+, F0N/F1T+	ns	ns			ns	ns	ns	ns	
F0N/F1V+, F0N/F1N	**0.023**	**0.048**			ns	**0.056**	**0.02**	ns	
F0N/F1T+, F0N/F1N	ns	ns			ns	ns	**0.045**	ns	
F0-bacteria x F1-bacteria x F0-sex	ns	ns	ns	**0.044***	ns	ns	ns	ns	ns
ANOSIM-Global R				**0.079**					
Significance level				**0.001**					
Groups									
F0Mat/F0V+/F1V+, F0Mat/F0V+/F1T+				ns					
F0Mat/F0V+/F1V+, F0Mat/F0V+/F1N				ns					
F0Mat/F0V+/F1V+, F0Mat/F0T+/F1V+				**0.001**					
F0Mat/F0V+/F1V+, F0Mat/F0T+/F1T+				**0.003**					
F0Mat/F0V+/F1V+, F0Mat/F0T+/F1N				**0.001**					
F0Mat/F0V+/F1V+, F0Pat/F0V+/F1V+				**0.008**					
F0Mat/F0V+/F1V+, F0Pat/F0V+/F1T+				**0.023**					
F0Mat/F0V+/F1V+, F0Pat/F0V+/F1N				ns					
F0Mat/F0V+/F1V+, F0Pat/F0T+/F1V+				**0.047**					
F0Mat/F0V+/F1V+, F0Pat/F0T+/F1T+				**0.006**					
F0Mat/F0V+/F1V+, F0Pat/F0T+/F1N				ns					
F0Mat/F0V+/F1V+, F0N/F1V+				**0.012**					
F0Mat/F0V+/F1V+, F0N/F1T+				**0.008**					
F0Mat/F0V+/F1V+, F0N/F1N				**0.001**					
F0Mat/F0V+/F1T+, F0Mat/F0V+/F1N				ns					
F0Mat/F0V+/F1T+, F0Mat/F0T+/F1V+				**0.001**					
F0Mat/F0V+/F1T+, F0Mat/F0T+/F1T+				**0.008**					
F0Mat/F0V+/F1T+, F0Mat/F0T+/F1N				**0.001**					
F0Mat/F0V+/F1T+, F0Pat/F0V+/F1V+				ns					
F0Mat/F0V+/F1T+, F0Pat/F0V+/F1T+				ns					

F0Mat/F0V+/F1T+, F0Pat/F0V+/F1N				ns				
F0Mat/F0V+/F1T+, F0Pat/F0T+/F1V+				0.017				
F0Mat/F0V+/F1T+, F0Pat/F0T+/F1T+				0.019				
F0Mat/F0V+/F1T+, F0Pat/F0T+/F1N				ns				
F0Mat/F0V+/F1T+, F0N/F1V+				0.037				
F0Mat/F0V+/F1T+, F0N/F1T+				0.046				
F0Mat/F0V+/F1T+, F0N/F1N				0.026				
F0Mat/F0V+/F1N, F0Mat/F0T+/F1V+				0.001				
F0Mat/F0V+/F1N, F0Mat/F0T+/F1T+				0.038				
F0Mat/F0V+/F1N, F0Mat/F0T+/F1N				0.006				
F0Mat/F0V+/F1N, F0Pat/F0V+/F1V+				ns				
F0Mat/F0V+/F1N, F0Pat/F0V+/F1T+				ns				
F0Mat/F0V+/F1N, F0Pat/F0V+/F1N				ns				
F0Mat/F0V+/F1N, F0Pat/F0T+/F1V+				0.018				
F0Mat/F0V+/F1N, F0Pat/F0T+/F1T+				ns				
F0Mat/F0V+/F1N, F0Pat/F0T+/F1N				ns				
F0Mat/F0V+/F1N, F0N/F1V+				ns				
F0Mat/F0V+/F1N, F0N/F1T+				ns				
F0Mat/F0V+/F1N, F0N/F1N				ns				
F0Mat/F0T+/F1V+, F0Mat/F0T+/F1T+				ns				
F0Mat/F0T+/F1V+, F0Mat/F0T+/F1N				ns				
F0Mat/F0T+/F1V+, F0Pat/F0V+/F1V+				0.001				
F0Mat/F0T+/F1V+, F0Pat/F0V+/F1T+				0.001				
F0Mat/F0T+/F1V+, F0Pat/F0V+/F1N				0.001				
F0Mat/F0T+/F1V+, F0Pat/F0T+/F1V+				0.006				
F0Mat/F0T+/F1V+, F0Pat/F0T+/F1T+				ns				
F0Mat/F0T+/F1V+, F0Pat/F0T+/F1N				0.02				
F0Mat/F0T+/F1V+, F0N/F1V+				0.008				
F0Mat/F0T+/F1V+, F0N/F1T+				ns				
F0Mat/F0T+/F1V+, F0N/F1N				0.001				
F0Mat/F0T+/F1T+, F0Mat/F0T+/F1N				ns				
F0Mat/F0T+/F1T+, F0Pat/F0V+/F1V+				0.002				
F0Mat/F0T+/F1T+, F0Pat/F0V+/F1T+				0.003				
F0Mat/F0T+/F1T+, F0Pat/F0V+/F1N				0.003				
F0Mat/F0T+/F1T+, F0Pat/F0T+/F1V+				0.013				
F0Mat/F0T+/F1T+, F0Pat/F0T+/F1T+				ns				
F0Mat/F0T+/F1T+, F0Pat/F0T+/F1N				0.033				
F0Mat/F0T+/F1T+, F0N/F1V+				ns				
F0Mat/F0T+/F1T+, F0N/F1T+				ns				
F0Mat/F0T+/F1T+, F0N/F1N				ns				
F0Mat/F0T+/F1N, F0Pat/F0V+/F1V+				0.002				
F0Mat/F0T+/F1N, F0Pat/F0V+/F1T+				0.002				
F0Mat/F0T+/F1N, F0Pat/F0V+/F1N				0.002				
F0Mat/F0T+/F1N, F0Pat/F0T+/F1V+				0.023				
F0Mat/F0T+/F1N, F0Pat/F0T+/F1T+				0.04				
F0Mat/F0T+/F1N, F0Pat/F0T+/F1N				ns				
F0Mat/F0T+/F1N, F0N/F1V+				0.017				
F0Mat/F0T+/F1N, F0N/F1T+				0.022				
F0Mat/F0T+/F1N, F0N/F1N				0.002				

F0Pat/F0V+/F1V+, F0Pat/F0V+/F1T+				ns					
F0Pat/F0V+/F1V+, F0Pat/F0V+/F1N				ns					
F0Pat/F0V+/F1V+, F0Pat/F0T+/F1V+				**0.001**					
F0Pat/F0V+/F1V+, F0Pat/F0T+/F1T+				**0.044**					
F0Pat/F0V+/F1V+, F0Pat/F0T+/F1N				**0.016**					
F0Pat/F0V+/F1V+, F0N/F1V+				**0.029**					
F0Pat/F0V+/F1V+, F0N/F1T+				**0.004**					
F0Pat/F0V+/F1V+, F0N/F1N				**0.025**					
F0Pat/F0V+/F1T+, F0Pat/F0V+/F1N				ns					
F0Pat/F0V+/F1T+, F0Pat/F0T+/F1V+				**0.004**					
F0Pat/F0V+/F1T+, F0Pat/F0T+/F1T+				ns					
F0Pat/F0V+/F1T+, F0Pat/F0T+/F1N				**0.032**					
F0Pat/F0V+/F1T+, F0N/F1V+				**0.026**					
F0Pat/F0V+/F1T+, F0N/F1T+				**0.024**					
F0Pat/F0V+/F1T+, F0N/F1N				**0.045**					
F0Pat/F0V+/F1N, F0Pat/F0T+/F1V+				**0.002**					
F0Pat/F0V+/F1N, F0Pat/F0T+/F1T+				**0.025**					
F0Pat/F0V+/F1N, F0Pat/F0T+/F1N				ns					
F0Pat/F0V+/F1N, F0N/F1V+				**0.04**					
F0Pat/F0V+/F1N, F0N/F1T+				**0.001**					
F0Pat/F0V+/F1N, F0N/F1N				**0.031**					
F0Pat/F0T+/F1V+, F0Pat/F0T+/F1T+				ns					
F0Pat/F0T+/F1V+, F0Pat/F0T+/F1N				ns					
F0Pat/F0T+/F1V+, F0N/F1V+				**0.006**					
F0Pat/F0T+/F1V+, F0N/F1T+				ns					
F0Pat/F0T+/F1V+, F0N/F1N				**0.001**					
F0Pat/F0T+/F1T+, F0Pat/F0T+/F1N				ns					
F0Pat/F0T+/F1T+, F0N/F1V+				ns					
F0Pat/F0T+/F1T+, F0N/F1T+				ns					
F0Pat/F0T+/F1T+, F0N/F1N				**0.02**					
F0Pat/F0T+/F1N, F0N/F1V+				ns					
F0Pat/F0T+/F1N, F0N/F1T+				**0.046**					
F0Pat/F0T+/F1N, F0N/F1N				**0.003**					
F0N/F1V+, F0N/F1T+				ns					
F0N/F1V+, F0N/F1N				ns					
F0N/F1T+, F0N/F1N				ns					

Table S2: Results from PERMANOVA and ANOSIM analysis of four-month-old per functional gene categories and immune cell measurements. Multivariate ANOSIM was performed following significant PERMANOVA to assess differences in the gene expression profiles and immune cell measurement per treatment groups applying pairwise comparison based on a Bray-Curtis distance matrix and 999 permutations. Pairwise comparison was conducted for following fixed factors and their interaction: F0-bacteria treatment effect (parental control (F0N), parental *Vibrio* (F0V+) vs *Tenacibaculum* (F0T+)), F0-sex´ (maternal (F0Mat), paternal (F0Pat) vs control (F0N)) and `F1-bacteria´ (F1-offspring control (F1N), F1-offspring *Vibrio* (F1V+) and *Tenacibaculum* (F1T+)).

4-month-old	**Immune genes (29)**	**Innate genes (13)**	**Innate & Adaptive genes (5)**	**Adaptive genes (8)**	**Complemet component genes (3)**	**Epigenetic genes (15)**	**DNAmethylation genes (5)**	**Histone de/methylation genes (4)**	**Histone de/acetylation genes (5)**	**Cell counts**	**Cell counts blood**	**Cell counts hk**
F0-bacteria	**0.002****	**0.001*****	ns	ns	ns	ns	**0.020***	ns	ns	**0.001*****	**0.006****	**0.001*****
Global R	0.061	0.042					0.088			0.162	0.168	0.159
Significance level	0.001	0.005					0.001			0.001	0.001	0.001
Groups												
F0V+, F0T+	**0.004**	**0.003**					**0.002**			**0.001**	**0.001**	**0.007**
F0V+, F0N	**0.001**	**0.005**					**0.001**			**0.001**	**0.003**	**0.001**
F0T+, F0N	ns	ns					ns			**0.001**	**0.001**	**0.001**
F0-sex	**0.002****	**0.001*****	ns	ns	ns	ns	**0.020***	ns	ns	**0.001*****	**0.006****	**0.004****
ANOSIM-Global R	0.052	0.035					0.020			0.129	0.111	0.139
Significance level	0.001	0.04					0.046			0.001	0.001	0.001
Groups												
F0Mat, F0Pat	**0.009**	**0.019**					ns			ns	ns	ns
F0Mat, F0N	**0.005**	**ns**					**0.003**			**0.001**	**0.001**	**0.001**
F0Pat, F0N	**0.001**	**0.003**					**0.003**			**0.001**	**0.003**	**0.001**
F1-bacteria	**<0.001*****	**<0.001*****	**<0.001*****	ns	ns	ns	**ns**	ns	ns	**<0.001*****	**<0.001*****	**<0.001*****
ANOSIM-Global R	0.059	0.08	0.032				ns			0.036	0.008	0.06
Significance level	0.001	0.001	0.001				ns			0.006	0.004	0.006
Groups												
F1V+, F1T+	**ns**	**ns**	**ns**				ns			**ns**	**ns**	**ns**
F1V+, F1N	**0.001**	**0.0001**	**0.003**				ns			**0.002**	**0.005**	**0.002**
F1T+, F1N	**0.002**	**0.0002**	**0.003**				ns			**0.004**	**0.004**	**0.001**
F0-bacteria x F1-bacteria	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
F0-sex x F1-bacteria	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
F0-bacteria x F1-bacteria x F0-sex	ns	ns	ns	**0.044***	ns	ns	ns	ns	ns	**0.042***	ns	**0.008****
ANOSIM-Global R				0.142						0.133		0.181
Significance level				0.001						0.001		0.001
Groups												
F0Mat/F0V+/F1V+, F0Mat/F0V+/F1T+				ns						ns		ns
F0Mat/F0V+/F1V+, F0Mat/F0V+/F1N				ns						ns		ns
F0Mat/F0V+/F1V+, F0Mat/F0T+/F1V+				**0.01**						**0.037**		ns
F0Mat/F0V+/F1V+, F0Mat/F0T+/F1T+				**0.01**						ns		ns
F0Mat/F0V+/F1V+, F0Mat/F0T+/F1N				ns						ns		ns
F0Mat/F0V+/F1V+, F0Pat/F0V+/F1V+				ns						ns		ns
F0Mat/F0V+/F1V+, F0Pat/F0V+/F1T+				ns						ns		**0.009**

F0Mat/F0V+/F1V+, F0Pat/F0V+/F1N				ns						ns		ns
F0Mat/F0V+/F1V+, F0Pat/F0T+/F1V+				ns						ns		ns
F0Mat/F0V+/F1V+, F0Pat/F0T+/F1T+				ns						ns		ns
F0Mat/F0V+/F1V+, F0Pat/F0T+/F1N				ns						ns		ns
F0Mat/F0V+/F1V+, F0N/F1V+				ns						ns		**0.041**
F0Mat/F0V+/F1V+, F0N/F1T+				ns						ns		**0.006**
F0Mat/F0V+/F1V+, F0N/F1N				**0.04**						ns		**0.001**
F0Mat/F0V+/F1T+, F0Mat/F0V+/F1N				**ns**						ns		ns
F0Mat/F0V+/F1T+, F0Mat/F0T+/F1V+				ns						**0.048**		ns
F0Mat/F0V+/F1T+, F0Mat/F0T+/F1T+				**0**						ns		ns
F0Mat/F0V+/F1T+, F0Mat/F0T+/F1N				ns						ns		ns
F0Mat/F0V+/F1T+, F0Pat/F0V+/F1V+				ns						ns		ns
F0Mat/F0V+/F1T+, F0Pat/F0V+/F1T+				ns						ns		**0.022**
F0Mat/F0V+/F1T+, F0Pat/F0V+/F1N				ns						ns		**0.048**
F0Mat/F0V+/F1T+, F0Pat/F0T+/F1V+				ns						ns		ns
F0Mat/F0V+/F1T+, F0Pat/F0T+/F1T+				ns						ns		ns
F0Mat/F0V+/F1T+, F0Pat/F0T+/F1N				ns						ns		ns
F0Mat/F0V+/F1T+, F0N/F1V+				ns						ns		ns
F0Mat/F0V+/F1T+, F0N/F1T+				**0.01**						ns		**0.032**
F0Mat/F0V+/F1T+, F0N/F1N				**0.01**						ns		**0.001**
F0Mat/F0V+/F1N, F0Mat/F0T+/F1V+				**0**						**0.037**		ns
F0Mat/F0V+/F1N, F0Mat/F0T+/F1T+				**0**						ns		ns
F0Mat/F0V+/F1N, F0Mat/F0T+/F1N				**0.02**						ns		ns
F0Mat/F0V+/F1N, F0Pat/F0V+/F1V+				**0.01**						ns		ns
F0Mat/F0V+/F1N, F0Pat/F0V+/F1T+				**0**						**0.026**		**0.017**
F0Mat/F0V+/F1N, F0Pat/F0V+/F1N				ns						ns		ns
F0Mat/F0V+/F1N, F0Pat/F0T+/F1V+				**0.01**						**0.043**		ns
F0Mat/F0V+/F1N, F0Pat/F0T+/F1T+				**0.04**						ns		ns
F0Mat/F0V+/F1N, F0Pat/F0T+/F1N				ns						ns		ns
F0Mat/F0V+/F1N, F0N/F1V+				**0.01**						ns		ns
F0Mat/F0V+/F1N, F0N/F1T+				**0**						ns		ns
F0Mat/F0V+/F1N, F0N/F1N				**0**						ns		**0.007**
F0Mat/F0T+/F1V+, F0Mat/F0T+/F1T+				ns						ns		ns
F0Mat/F0T+/F1V+, F0Mat/F0T+/F1N				ns						ns		ns
F0Mat/F0T+/F1V+, F0Pat/F0V+/F1V+				ns						ns		ns
F0Mat/F0T+/F1V+, F0Pat/F0V+/F1T+				ns						ns		ns
F0Mat/F0T+/F1V+, F0Pat/F0V+/F1N				ns						**0.015**		**0.028**
F0Mat/F0T+/F1V+, F0Pat/F0T+/F1V+				ns						ns		ns
F0Mat/F0T+/F1V+, F0Pat/F0T+/F1T+				ns						ns		ns
F0Mat/F0T+/F1V+, F0Pat/F0T+/F1N				**0.03**						ns		ns
F0Mat/F0T+/F1V+, F0N/F1V+				ns						ns		**0.033**
F0Mat/F0T+/F1V+, F0N/F1T+				ns						**0.041**		**0.011**
F0Mat/F0T+/F1V+, F0N/F1N				**0.01**						**0.002**		**0.001**
F0Mat/F0T+/F1T+, F0Mat/F0T+/F1N				ns						ns		ns
F0Mat/F0T+/F1T+, F0Pat/F0V+/F1V+				**0.04**						ns		ns
F0Mat/F0T+/F1T+, F0Pat/F0V+/F1T+				ns						**0.032**		ns
F0Mat/F0T+/F1T+, F0Pat/F0V+/F1N				ns						**0.006**		**0.009**
F0Mat/F0T+/F1T+, F0Pat/F0T+/F1V+				ns						ns		ns
F0Mat/F0T+/F1T+, F0Pat/F0T+/F1T+				ns						ns		ns

F0Mat/F0T+/F1T+, F0Pat/F0T+/F1N				0.02						ns		ns
F0Mat/F0T+/F1T+, F0N/F1V+				ns						ns		ns
F0Mat/F0T+/F1T+, F0N/F1T+				ns						ns		0.033
F0Mat/F0T+/F1T+, F0N/F1N				ns						0.018		0.001
F0Mat/F0T+/F1N, F0Pat/F0V+/F1V+				ns						0.043		0.009
F0Mat/F0T+/F1N, F0Pat/F0V+/F1T+				ns						0.026		0.002
F0Mat/F0T+/F1N, F0Pat/F0V+/F1N				ns						ns		ns
F0Mat/F0T+/F1N, F0Pat/F0T+/F1V+				ns						ns		ns
F0Mat/F0T+/F1N, F0Pat/F0T+/F1T+				ns						ns		ns
F0Mat/F0T+/F1N, F0Pat/F0T+/F1N				ns						ns		ns
F0Mat/F0T+/F1N, F0N/F1V+				ns						ns		ns
F0Mat/F0T+/F1N, F0N/F1T+				ns						0.048		ns
F0Mat/F0T+/F1N, F0N/F1N				ns						ns		0.008
F0Pat/F0V+/F1V+, F0Pat/F0V+/F1T+				ns						ns		0.035
F0Pat/F0V+/F1V+, F0Pat/F0V+/F1N				ns						ns		0.013
F0Pat/F0V+/F1V+, F0Pat/F0T+/F1V+				ns						0.009		0.022
F0Pat/F0V+/F1V+, F0Pat/F0T+/F1T+				ns						ns		ns
F0Pat/F0V+/F1V+, F0Pat/F0T+/F1N				ns						0.045		ns
F0Pat/F0V+/F1V+, F0N/F1V+				ns						0.035		0.005
F0Pat/F0V+/F1V+, F0N/F1T+				0						0.018		0.003
F0Pat/F0V+/F1V+, F0N/F1N				0						0.015		0.001
F0Pat/F0V+/F1T+, F0Pat/F0V+/F1N				ns						0.017		0.006
F0Pat/F0V+/F1T+, F0Pat/F0T+/F1V+				ns						0.004		0.011
F0Pat/F0V+/F1T+, F0Pat/F0T+/F1T+				ns						0.037		ns
F0Pat/F0V+/F1T+, F0Pat/F0T+/F1N				ns						ns		ns
F0Pat/F0V+/F1T+, F0N/F1V+				ns						ns		ns
F0Pat/F0V+/F1T+, F0N/F1T+				0.03						ns		0.012
F0Pat/F0V+/F1T+, F0N/F1N				0.01						0.005		0.001
F0Pat/F0V+/F1N, F0Pat/F0T+/F1V+				ns						0.024		0.009
F0Pat/F0V+/F1N, F0Pat/F0T+/F1T+				ns						0.002		0.009
F0Pat/F0V+/F1N, F0Pat/F0T+/F1N				ns						0.024		0.015
F0Pat/F0V+/F1N, F0N/F1V+				ns						ns		ns
F0Pat/F0V+/F1N, F0N/F1T+				0.001						ns		ns
F0Pat/F0V+/F1N, F0N/F1N				0.001						ns		ns
F0Pat/F0T+/F1V+, F0Pat/F0T+/F1T+				ns						ns		ns
F0Pat/F0T+/F1V+, F0Pat/F0T+/F1N				ns						ns		ns
F0Pat/F0T+/F1V+, F0N/F1V+				ns						ns		ns
F0Pat/F0T+/F1V+, F0N/F1T+				ns						ns		ns
F0Pat/F0T+/F1V+, F0N/F1N				0.05						ns		0.002
F0Pat/F0T+/F1T+, F0Pat/F0T+/F1N				ns						ns		ns
F0Pat/F0T+/F1T+, F0N/F1V+				ns						ns		ns
F0Pat/F0T+/F1T+, F0N/F1T+				ns						ns		0.048
F0Pat/F0T+/F1T+, F0N/F1N				0.02						0.024		0.001
F0Pat/F0T+/F1N, F0N/F1V+				0.03						ns		ns
F0Pat/F0T+/F1N, F0N/F1T+				0.01						ns		ns
F0Pat/F0T+/F1N, F0N/F1N				0.001						0.042		0.001
F0N/F1V+, F0N/F1T+				ns						ns		ns
F0N/F1V+, F0N/F1N				0.01						0.023		0.005

F0N/F1T+, F0N/F1N				ns						**0.016**		**0.008**

Table S3: Immune gene contribution (29) of one-week-old juveniles based on the scores of two extracted principle coordinates. Variance summaries are listed for the two principle components of the Between Class Analysis (BCA) (Inertia %) and contributions of each gene (gene contribution %) on the respective principle components (Axis1 and Axis2). Genes with a contribution of above 25 % summed average contribution, were considered as important genes which added the highest variance to the dimensional space and are marked in bold letters.

	F0-bacteria		**F1-bacteria**		**F0 x F1-bacteria**	
	Axis 1	**Axis 2**	**Axis 1**	**Axis 2**	**Axis 1**	**Axis 2**
Inertia (Variance) %	66.4	33.6	93.9	6.1	47.0	23.8
Gene Contribution %	Contribution %		Contribution %		Contribution %	
Lymphocyte antigen 75	2.9	2.5	0.8	1.6	2.6	0.9
HIVEP2	3.4	0.6	0.0	0.0	0.9	3.7
HIVEP3	**5.8**	0.0	0.1	0.1	1.3	**6.3**
CD45	**5.5**	1.4	1.1	0.6	0.3	**8.9**
Integrin	0.0	2.8	5.3	0.8	2.3	4.0
Immunoglobulin light chain	**12.1**	0.1	0.0	0.0	3.3	**8.8**
Lymphocyte cytosolic protein 2	0.7	4.2	0.1	2.9	0.6	1.0
Tapasin	**4.7**	2.3	0.1	2.2	1.2	**5.2**
Lectin protein I	**15.4**	1.7	0.8	2.5	1.9	**14.8**
Lectin protein II	2.1	**11.1**	0.5	**4.6**	0.0	2.6
Coagulation factor II	0.4	**19.0**	0.1	**5.1**	0.0	0.9
Heat shock protein 60 (Hsp60)	0.4	0.2	0.5	0.0	0.5	0.0
Peptidoglycan recognition protein	0.0	0.1	0.1	**13.4**	0.0	0.5
Kinesin	0.2	0.9	0.1	0.8	0.3	0.1
Nramp	0.0	4.2	1.2	**3.7**	0.3	1.5
Allograft inflammation factor	**7.4**	3.1	**27.3**	1.1	**26.0**	2.6
Translocator protein	0.1	0.5	**6.0**	**11.4**	1.8	**7.2**
Transferrin	0.5	0.3	1.0	0.7	1.1	0.0
Calreticulin	0.8	0.2	0.0	**9.0**	0.1	0.0
Interferon	3.9	1.9	**14.8**	0.1	**13.7**	1.7
Interleukin 8	0.4	**18.1**	0.8	2.9	0.1	1.8
Interleukin 10	2.0	0.2	**13.3**	0.0	**10.4**	2.4
LPS induced TNFα factor	0.1	**6.0**	1.5	0.7	0.7	1.0
Tyroproteinkinase	0.9	0.2	1.0	0.0	1.5	0.1
Chemokine 7	**17.6**	0.3	0.5	0.3	3.4	**18.4**
Ik-cytokine	0.1	**9.5**	0.3	**10.6**	0.0	1.8
Complement component 3	**5.9**	0.1	**18.0**	**7.5**	**17.9**	1.4
Complement component 1	**6.7**	**4.8**	3.3	**3.7**	**7.2**	0.8
Complement component 9	0.1	3.8	1.7	**13.9**	0.7	1.8

Table S4: Immune gene contribution (29) of four-month-old juveniles based on the scores of two extracted principle coordinates. Variance summaries are listed for the two principle components of the Between Class Analysis (BCA) (Inertia %) and contributions of each gene (gene contribution %) on the respective principle components (Axis1 and Axis2). Genes with a contribution of above 25 % summed average contribution, were considered as important genes which added the highest variance to the dimensional space and are marked in bold letters.

	F0-bacteria		**F1-bacteria**		**F0 x F1-bacteria**	
	Axis 1	**Axis 2**	**Axis 1**	**Axis 2**	**Axis 1**	**Axis 2**
Inertia (Variance) %	89.2	10.8	87.5	12.5	34.6	28.6
Gene Contribution %	Contribution %		Contribution %		Contribution %	
Lymphocyte antigen 75	0.7	3.2	5.0	0.1	2.1	3.33
HIVEP2	**7.7**	2.5	0.5	**9.5**	**5.99**	3.35
HIVEP3	**10.0**	1.0	2.4	**9.7**	**6.41**	**8.15**
CD45	0.0	0.0	1.7	0.2	0.17	1.13
Integrin	2.1	0.6	2.4	1.5	1.03	3.43
Immunoglobulin light chain	**2.9**	**7.6**	0.1	1.1	2.62	0.43
Lymphocyte cytosolic protein 2	1.0	0.5	1.8	0.3	0.47	3.01
Tapasin	0.5	0.2	0.2	2.3	0.57	0.36
Lectin protein I	0.1	1.7	0.8	2.0	0.08	0.49
Lectin protein II	0.4	4.0	1.7	3.8	0.85	0.43
Coagulation factor II	1.9	4.1	1.7	**7.7**	0.25	3.56
Heat shock protein 60 (Hsp60)	**6.2**	3.2	3.2	5.0	**7.11**	0.41
Peptidoglycan recognition protein	**7.3**	0.7	0.8	1.7	**6.36**	0.16
Kinesin	**5.7**	4.6	1.5	1.1	**6.07**	0.03
Nramp	**4.0**	3.4	0.2	0.1	**3.67**	0.16
Allograft inflammmation factor	2.6	0.2	**12.4**	3.3	**8.21**	**7.19**
Translocator protein	0.2	**27.2**	1.1	1.6	0.01	0.56
Transferrin	0.7	**7.6**	**16.3**	2.8	**4.8**	**13.29**
Calreticulin	0.1	**7.5**	2.2	0.2	0.81	1.5
Interferon	1.3	2.1	**27.9**	0.2	**7.37**	**21.34**
Interleukin 8	**4.7**	0.1	0.3	**6.0**	0.52	0.28
Interleukin 10	0.6	4.1	0.0	3.9	**4.53**	0.49
LPS induced TNFα factor	0.3	1.1	2.4	**27.2**	0.11	3.16
Tyroproteinkinase	**10.9**	0.5	0.0	0.5	**7.97**	1.8
Chemokine 7	2.4	0.2	**9.5**	**7.3**	0.26	**13.09**
Ik-cytokine	2.5	0.0	0.5	0.1	2.34	1.8
Complement component 3	**13.0**	3.2	1.6	0.9	**7.05**	0.1
Complement component 1	**5.6**	**7.9**	0.1	0.1	**9.81**	1.92
Complement component 9	**4.8**	1.3	2.0	0.0	2.45	5.07

Table S5: Epigenetic gene contribution (15) of one-week-old juveniles based on the scores of two extracted principle coordinates. Variance summaries are listed for the two principle components of the Between Class Analysis (BCA) (Inertia %) and contributions of each gene (gene contribution %) on the respective principle components (Axis1 and Axis2). Genes with a contribution of above 25 % summed average contribution, were considered as important genes which added the highest variance to the dimensional space and are marked in bold letters.

	F0-bacteria		**F1-bacteria**	
	Axis 1	**Axis 2**	**Axis 1**	**Axis 2**
Inertia (Variance) %	87.7	12.3	83.8	16.2
Gene Contribution %	Contribution %		Contribution %	
Transcription factor 8	**11.6**	1.8	0.1	**11.2**
DNA-methyltransferase 1	0.2	2.2	**9.3**	0.2
DNA-methyltransferase 3a	**7.5**	0.5	6.2	2.3
DNA-methyltransferase 3b	**10.7**	0.0	0.1	1.3
HemK2-methyltransferase	5.6	**10.4**	6.0	2.3
N6admet- methyltransferase	3.1	1.2	0.1	5.5
Lysine specific demethylase 5B (JmjcPhD)	1.9	**21.8**	**12.7**	0.1
Lysine specific demethylase (No66)	**6.9**	**16.0**	0.3	**19.9**
Lysine specific demethylase 6A (TPR)	0.6	**7.5**	8.0	0.2
Histone methyltransferase (ASH2)	**11.9**	**21.9**	6.7	6.0
Histone acetyltransferase KAT2A (BROMO)	**24.6**	1.7	0.0	**13.4**
Histone acetyltransferase HAT1 (MYST)	**7.7**	0.0	6.3	**30.8**
Histone deacetylase 1 (HDAC1)	3.9	3.5	**36.3**	0.6
Histone deacetylase 3 (HDAC3)	0.3	**11.3**	5.8	3.3
Histone deacetylase 6 (HDAC6)	3.7	0.1	2.0	2.8

Table S6: DNA-methylation gene contribution (5) of four-month-old juveniles based on the scores of two extracted principle coordinates. Variance summaries are listed for the two principle components of the Between Class Analysis (BCA) (Inertia %) and contributions of each gene (gene contribution %) on the respective principle components (Axis1 and Axis2). Genes with a contribution of above 25 % summed average contribution, were considered as important genes which added the highest variance to the dimensional space and are marked in bold letters.

	F0-bacteria		**F1-bacteria**	
	Axis 1	**Axis 2**	**Axis 1**	**Axis 2**
Inertia (Variance) %	86.6	13.44	91.9	8.1
Gene Contribution %	Contribution %		Contribution %	
DNA-methyltransferase 1	5.4	9.86	1.2	0.7
DNA-methyltransferase 3a	**61**	0.01	**26.7**	**34.1**
DNA-methyltransferase 3b	**18.4**	**50.8**	**49.1**	0.7
N6admet- methyltransferase	11.7	**36**	**12.7**	**52.1**
HemK2-methyltransferase	3.46	3.41	10.4	12.3

Table S7. Linear Mixed effect model to test for F0-bacteria effects in time of maturation of adult pipefish males and clutch size of six-month-old F1-offspring.

		numDF	denDF	F-value	p-value
Maturity time	(Intercept)	1	126	29648.78	<.0001
	F0-bacteria	1	7	**325.0**	**<.0001**
		numDF	**denDF**	**F-value**	**p-value**
Clutch size	(Intercept)	1	15	204.80	<.0001
	F0-bacteria	1	7	**7.95**	**0.0257**

Table S8. Correlation analysis between immune genes and monocyte and lymphocyte count measurements from four-month-old juveniles. By using a Pearson correlation matrix, each single gene (−ΔCt-values) was correlated with each immune cell measurement (Monocyte, Lymphocyte counts) in the head kidney (hk) and blood.

Monocytes head kidney	Monocytes blood	Lymphocytes hk & blood
Lectin protein II	**Lectin protein I**	**Complement component 1**
R^2=0.26**, 0.0138	R^2=0.28**,0.038	R^2=-0.25*,0.016; -0.28**,0.007
Complement component 3	**Complement component 3**	**HIVEP3**
R2=0.35***, <0.001	R^2=0.23***,0.0109	R^2=-0.23*,0.031
Interferon	**Complement component 1**	
R^2=0.25**, 0.019	R^2=0.34***,<0.001	
Peptidoglycan	**Ik-cytokine**	
R^2=0.30**,0.004	R^2=0.23*,0.029	
Tyroproteinkinase	**Lymphantigen 75**	
R^2=0.23*,0.032	R^2=-0,22*, 0.038	