

Potential associations among alteration of salivary miRNAs, saliva microbiome structure and cognitive impairments in autistic children

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Species	<i>Actinobacillus parahaemolyticus</i>					
Type of model	NBR		MLR		SLR	
Model results	B	p-value	B	p-value	B	p-value
let-7b-5p	1.050	0.232	1.094	0.006	-0.007	0.726
miR-451a	-0.851	0.101	-0.217	0.323	-0.025	0.355
miR-29a-3p	-0.244	0.409	-0.178	0.151	-0.016	0.656
miR-16-5p	-0.160	0.651	-0.318	0.041	-0.003	0.696
miR-141-3p	0.059	0.000	0.030	0.001	0.027	0.000
VIQ	-0.020	0.659	0.002	0.927	-0.005	0.270
PIQ	-0.090	0.088	-0.046	0.043	-0.006	0.186
TIQ	0.119	0.200	0.048	0.201	-0.004	0.421
ADI-A	0.278	0.063	-0.010	0.891	0.032	0.110
ADI-B	-0.049	0.810	0.192	0.108	0.042	0.070
ADI-C	-0.473	0.000	-0.174	0.006	0.021	0.472
ADI-D	0.498	0.010	0.103	0.379	0.117	0.032
ADOS-A	0.086	0.660	0.006	0.949	0.065	0.118
ADOS-B	-0.023	0.870	0.014	0.859	0.049	0.043
ADOS-C	-0.602	0.057	-0.191	0.152	0.093	0.185
ADOS-D	0.577	0.091	0.163	0.211	0.118	0.052
Ammonium	-0.145	0.000	-0.035	0.044	0.002	0.901
Lactate	0.142	0.009	0.034	0.253	0.033	0.286
Ceruloplasmin	-0.121	0.021	-0.023	0.427	-0.006	0.827
Prolactin	0.000	0.904	0.000	0.900	0.001	0.535
TSH	0.262	0.430	0.333	0.082	0.063	0.726

Species	<i>Filifactor spp</i>					
Type of model	NBR		MLR		SLR	
Model results	B	p-value	B	p-value	B	p-value
let-7b-5p	-0.886	0.221	-0.045	0.423	-0.002	0.384
miR-451a	-0.512	0.322	0.035	0.281	-0.002	0.543
miR-29a-3p	0.455	0.060	0.039	0.040	0.002	0.664
miR-16-5p	0.227	0.497	0.000	0.997	-0.001	0.622
miR-141-3p	-0.061	0.000	-0.003	0.035	-0.001	0.335
VIQ	-0.064	0.177	-0.004	0.255	-0.001	0.049
PIQ	-0.098	0.042	-0.008	0.014	-0.002	0.001
TIQ	0.123	0.133	0.010	0.068	-0.002	0.004
ADI-A	0.236	0.053	0.022	0.055	0.007	0.007
ADI-B	-0.072	0.723	-0.022	0.211	0.007	0.034
ADI-C	0.101	0.410	-0.005	0.611	0.008	0.040
ADI-D	-0.295	0.153	-0.009	0.623	0.015	0.044
ADOS-A	-0.605	0.003	-0.015	0.297	0.006	0.269
ADOS-B	-0.263	0.067	-0.020	0.103	0.005	0.141
ADOS-C	0.390	0.087	0.003	0.862	0.013	0.177
ADOS-D	-0.215	0.326	0.008	0.671	0.015	0.059

Ammonium	0.002	0.950	-0.001	0.572	-0.003	0.190
Lactate	-0.041	0.467	-0.005	0.274	-0.007	0.060
Ceruloplasmin	0.068	0.336	0.001	0.869	-0.002	0.510
Prolactin	0.003	0.296	0.000	0.373	0.000	0.763
TSH	-0.326	0.429	0.006	0.841	0.030	0.196

Species	<i>Moryella spp</i>					
Type of model	NBR		MLR		SLR	
Model results	B	p-value	B	p-value	B	p-value
let-7b-5p	-0.079	0.846	-0.063	0.623	-0.001	0.845
miR-451a	-0.450	0.079	0.009	0.900	-0.006	0.528
miR-29a-3p	0.045	0.739	-0.016	0.695	-0.019	0.141
miR-16-5p	0.064	0.697	0.020	0.705	-0.002	0.418
miR-141-3p	-0.051	0.000	-0.006	0.049	-0.005	0.029
VIQ	-0.034	0.141	-0.006	0.398	0.005	0.001
PIQ	-0.031	0.185	-0.003	0.738	0.005	0.002
TIQ	0.055	0.148	0.009	0.465	0.005	0.001
ADI-A	-0.128	0.215	-0.019	0.458	-0.018	0.010
ADI-B	-0.047	0.710	0.021	0.599	-0.019	0.020
ADI-C	-0.051	0.429	0.006	0.786	-0.023	0.027
ADI-D	-0.130	0.281	-0.073	0.077	-0.059	0.002
ADOS-A	0.044	0.616	0.031	0.354	-0.025	0.093
ADOS-B	-0.158	0.072	-0.009	0.741	-0.018	0.041
ADOS-C	0.152	0.335	0.032	0.480	-0.038	0.132
ADOS-D	-0.098	0.482	-0.017	0.697	-0.038	0.083
Ammonium	0.013	0.496	0.009	0.134	0.002	0.650
Lactate	0.020	0.492	-0.013	0.196	-0.011	0.174
Ceruloplasmin	0.106	0.003	0.021	0.039	0.017	0.026
Prolactin	0.003	0.022	0.000	0.752	0.000	0.901
TSH	0.003	0.988	0.022	0.730	-0.008	0.868

Species	<i>Pasteurellaceae</i>					
Type of model	NBR		MLR		SLR	
Model results	B	p-value	B	p-value	B	p-value
let-7b-5p	0.734	0.281	0.069	0.664	0.000	0.976
miR-451a	-0.023	0.945	0.036	0.694	-0.003	0.699
miR-29a-3p	0.159	0.421	0.046	0.380	0.009	0.461
miR-16-5p	-0.272	0.351	-0.040	0.535	0.000	0.873
miR-141-3p	0.021	0.175	0.004	0.264	0.005	0.015
VIQ	0.020	0.617	0.003	0.737	-0.002	0.077
PIQ	0.082	0.064	0.006	0.508	-0.002	0.154
TIQ	-0.082	0.285	-0.006	0.692	-0.002	0.137
ADI-A	-0.117	0.454	-0.019	0.557	0.006	0.360
ADI-B	-0.197	0.320	-0.032	0.516	0.010	0.183

ADI-C	-0.134	0.194	-0.006	0.803	0.009	0.354
ADI-D	0.406	0.046	0.037	0.456	0.030	0.085
ADOS-A	-0.258	0.087	-0.027	0.509	0.020	0.118
ADOS-B	0.199	0.116	0.024	0.481	0.016	0.031
ADOS-C	0.055	0.814	0.044	0.428	0.059	0.006
ADOS-D	0.400	0.116	0.070	0.207	0.045	0.017
Ammonium	-0.029	0.334	-0.002	0.810	0.002	0.783
Lactate	0.082	0.057	0.006	0.615	0.012	0.208
Ceruloplasmin	-0.100	0.019	-0.026	0.040	-0.011	0.212
Prolactin	0.000	0.866	0.000	0.780	0.000	0.908
TSH	-0.294	0.329	-0.051	0.520	-0.016	0.773

Species	<i>Ralstonia spp</i>					
Type of model	NBR		MLR		SLR	
Model results	B	p-value	B	p-value	B	p-value
let-7b-5p	-1.763	0.203	-0.168	0.547	0.007	0.513
miR-451a	-2.747	0.112	-0.065	0.692	0.003	0.831
miR-29a-3p	0.419	0.135	0.062	0.500	0.023	0.221
miR-16-5p	1.174	0.064	0.066	0.558	0.004	0.358
miR-141-3p	-0.049	0.063	-0.003	0.575	-0.002	0.501
VIQ	0.233	0.002	0.001	0.965	-0.003	0.211
PIQ	0.151	0.031	-0.001	0.948	-0.004	0.095
TIQ	-0.350	0.005	-0.005	0.865	-0.004	0.085
ADI-A	0.102	0.704	0.019	0.737	0.014	0.164
ADI-B	0.107	0.765	-0.049	0.580	0.014	0.230
ADI-C	-0.024	0.893	0.017	0.702	0.012	0.414
ADI-D	-0.027	0.942	-0.006	0.941	0.036	0.199
ADOS-A	-0.372	0.278	0.058	0.419	0.040	0.053
ADOS-B	0.120	0.640	-0.051	0.392	0.015	0.211
ADOS-C	0.095	0.828	-0.017	0.862	0.055	0.118
ADOS-D	0.380	0.368	0.066	0.496	0.045	0.143
Ammonium	0.077	0.152	0.005	0.692	-0.007	0.445
Lactate	-0.036	0.767	-0.010	0.656	-0.024	0.117
Ceruloplasmin	0.119	0.180	0.036	0.098	0.025	0.075
Prolactin	-0.009	0.066	0.000	0.928	0.000	0.764
TSH	-0.679	0.308	-0.077	0.582	-0.105	0.245

Species	<i>Tannerella spp</i>					
Type of model	NBR		MLR		SLR	
Model results	B	p-value	B	p-value	B	p-value
let-7b-5p	-1.130	0.002	-0.076	0.215	0.005	0.344
miR-451a	-0.008	0.980	0.027	0.442	0.003	0.652
miR-29a-3p	-0.095	0.482	-0.010	0.632	0.001	0.931
miR-16-5p	0.429	0.003	0.024	0.326	0.001	0.490

miR-141-3p	-0.035	0.000	-0.003	0.055	-0.003	0.083
VIQ	-0.048	0.040	-0.006	0.067	0.002	0.093
PIQ	-0.059	0.008	-0.008	0.025	0.002	0.064
TIQ	0.089	0.025	0.013	0.040	0.002	0.049
ADI-A	0.069	0.339	0.017	0.167	-0.010	0.038
ADI-B	0.014	0.903	0.003	0.896	-0.015	0.011
ADI-C	0.146	0.028	0.009	0.382	-0.013	0.080
ADI-D	-0.162	0.145	-0.018	0.339	-0.029	0.036
ADOS-A	0.181	0.044	0.009	0.543	-0.025	0.015
ADOS-B	-0.195	0.009	-0.027	0.047	-0.017	0.006
ADOS-C	0.146	0.313	0.004	0.859	-0.037	0.031
ADOS-D	0.017	0.888	0.004	0.858	-0.034	0.025
Ammonium	0.024	0.183	0.002	0.439	0.000	0.868
Lactate	-0.001	0.957	-0.001	0.890	-0.005	0.223
Ceruloplasmin	0.024	0.447	0.005	0.302	-0.001	0.731
Prolactin	-0.084	0.955	0.000	0.981	0.000	0.600
TSH	-0.073	0.711	-0.004	0.883	0.017	0.453

Species	<i>Weeksellaceae</i>					
Type of model	NBR		MLR		SLR	
Model results	B	p-value	B	p-value	B	p-value
let-7b-5p	0.123	0.712	0.325	0.192	-0.006	0.653
miR-451a	-0.580	0.002	-0.280	0.058	-0.013	0.468
miR-29a-3p	0.060	0.606	0.036	0.657	0.003	0.914
miR-16-5p	0.046	0.734	-0.071	0.474	-0.002	0.703
miR-141-3p	0.026	0.001	0.025	0.000	0.022	0.000
VIQ	-0.061	0.002	-0.026	0.059	-0.004	0.131
PIQ	-0.038	0.049	-0.025	0.089	-0.002	0.521
TIQ	0.086	0.011	0.047	0.058	-0.002	0.528
ADI-A	0.071	0.263	0.038	0.443	0.018	0.160
ADI-B	-0.183	0.062	-0.027	0.729	0.024	0.120
ADI-C	0.050	0.326	0.027	0.500	0.026	0.187
ADI-D	-0.070	0.501	-0.104	0.180	0.031	0.393
ADOS-A	-0.008	0.924	0.009	0.891	0.035	0.205
ADOS-B	0.016	0.813	0.000	0.999	0.020	0.219
ADOS-C	-0.196	0.052	-0.169	0.057	0.000	0.994
ADOS-D	-0.036	0.762	0.003	0.968	0.023	0.576
Ammonium	-0.028	0.061	-0.015	0.168	0.003	0.815
Lactate	0.004	0.862	0.008	0.667	0.021	0.287
Ceruloplasmin	-0.003	0.918	0.005	0.772	-0.001	0.940
Prolactin	0.001	0.557	0.000	0.624	0.000	0.954
TSH	0.063	0.702	0.030	0.806	-0.043	0.712

Supplementary Table S3. Comparison between parameters estimated from the negative binomial regression (NBR), multiple linear regression (MLR) and simple linear regression (SLR) models predicting abundances of microbiome species: regression coefficient (B); statistical significance of the independent variables (p-values). Data for those MLR which statistical significance of overall model was not reached ($p > 0.05$) are shown in italic. Statistically significant p-values are indicated in bold ($p < 0.05$).