### **Supplementary Appendix**

### **Supplementary Table 1.** Summary of the db-RDA models (all participants).

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| --- | --- | --- | --- | --- |
| Taxon | Variance explained (full model\*) | Simplified mode – signficant effects of explanatory variables | Simplified model (R2) | Simplified model (adjusted R2) |
| Species | Constrained 0.0901  Unconstrained 0.9099  p = 0.004 | Education | 0.0500 | 0.0226 |
| Genus | Constrained 0.124  Unconstrained 0.876  p = 0.001 | Age, education, BMI | 0.1125 | 0.0690 |
| Family | Constrained 0.1315  Unconstrained 0.8685  p = 0.001 | Age, education, BMI | 0.1205 | 0.0773 |
| Order | Constrained 0.1415  Unconstrained 0.8585  p = 0.001 | Group status, age, education, BMI | 0.1584 | 0.1084 |
| Class | Constrained 0.14  Unconstrained 0.86  p = 0.001 | Group status, age, education, BMI | 0.1630 | 0.1132 |
| Phylum | Constrained 0.1182  Unconstrained 0.8818  p = 0.032 | Group status | 0.0517 | 0.0428 |

\*full model includes group status (SCZ vs. HCs), age, sex, BMI and education level

p refers to the Monte Carlo permutation test

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### **Supplementary Table 2.** Results of the analysis of deviance (a multivariate log-likelihood ratio test) - an overall difference of the community structure between patients with schizophrenia and healthy controls. The generalized linear model was based on the negative binomial distribution.

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| --- | --- | --- |
| Level of analysis | Deviance | p-value |
| Species | 91.65 | 0.028 |
| Genus | 217.7 | 0.021 |
| Family | 108 | 0.018 |
| Order | 79.15 | 0.009 |
| Class | 59.28 | 0.001 |
| Phylum | 29.83 | 0.014 |

Test statistics assume uncorrelated response (taxonomic/functional abundance). P-values were calculated using 999 iterations via PIT-trap resampling. Deviance refers to goodness-of-fit statistic.

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### **Supplementary Table 3.** Results of the analysis of deviance table (univariate log-likelihood ratio tests). The generalized linear model based on the negative binomial distribution with covariates.

|  |  |  |
| --- | --- | --- |
| Level of analysis | Deviance | p-value |
| Species | Group 85.65  Sex 63.04  Age 59.72  BMI 185.53  Education 206.17 | 0.043  0.113  0.077  0.056  0.029 |
| Genus | Group 213.8  Sex 108.2  Age 163.3  BMI 191.2  Education 475.9 | 0.021  0.376  0.060  0.117  0.036 |
| Family | Group 99.64  Sex 67.52  Age 98.70  BMI 99.02  Education 223.12 | 0.044  0.175  0.022  0.139  0.058 |
| Order | Group 70.40  Sex 40.66  Age 57.20  BMI 52.97  Education 130.04 | 0.006  0.146  0.028  0.024  0.030 |
| Class | Group 51.50  Sex 33.03  Age 26.14  BMI 40.68  Education 67.79 | 0.003  0.029  0.052  0.002  0.044 |
| Phylum | Group 25.81  Sex 19.38  Age 15.49  BMI 18.12  Education 38.72 | 0.009  0.048  0.064  0.037  0.064 |

Test statistics assume uncorrelated response (taxonomic). P-values were calculated using 999 iterations via the PIT-trap resampling. Deviance refers to the goodness-of-fit statistic.