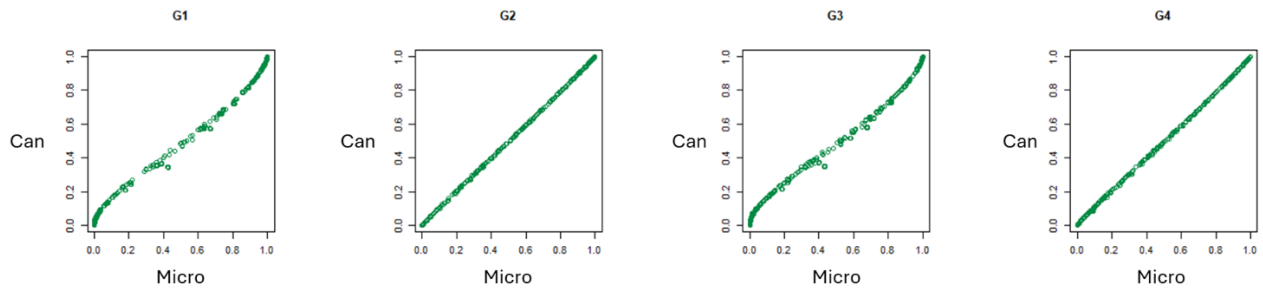


## Supplementary material



**Figure S1:** Scatterplots of the Monte Carlo simulated  $p$ -value for microcanonical approach (*Micro*) vs. the Monte Carlo simulated  $p$ -value for canonical approach (*Can*).

**Table S1:** The 10 highest species according to the overall ranking for group G1.

Species	ABO	AWO	RBD	RWD	IOBD	IOWD	MM	CM	Score
<i>Bifidobacterium longum</i>	1	1	0	0	1	1	1	1	75.00%
<i>Bifidobacterium breve</i>	1	1	0	0	1	1	1	1	75.00%
<i>Ruminococcus gnavus</i>	1	1	0	0	1	1	1	1	75.00%
<i>Escherichia coli</i>	1	1	0	0	0	1	1	1	62.50%
<i>Bifidobacterium bifidum</i>	0	1	0	0	1	1	1	1	62.50%
<i>Veillonella parvula</i>	0	1	0	0	1	1	1	1	62.50%
<i>Enterococcus faecalis</i>	0	1	0	0	1	1	1	1	62.50%
<i>Erysipelatoclostridium ramosum</i>	0	0	0	0	1	1	1	1	50.00%
<i>Veillonella atypica</i>	0	0	0	0	1	1	1	1	50.00%
<i>Haemophilus parainfluenzae</i>	0	0	0	0	1	1	1	1	50.00%

**Table S2:** The 10 highest species according to the overall ranking for group G2.

Species	ABO	AWO	RBD	RWD	IOBD	IOWD	MM	CM	Score
<i>Bacteroides unknown_species</i>	1	1	0	0	0	1	1	1	62.50%
<i>Faecalibacterium prausnitzii</i>	1	1	0	0	0	1	1	1	62.50%
<i>Faecalibacterium unknown_species</i>	1	1	0	0	0	1	1	1	62.50%
<i>Ruminococcus unknown_species</i>	1	1	0	0	0	1	1	1	62.50%

Bacteroides uniformis	1	1	0	0	0	1	1	1	62.50%
Eubacterium rectale	1	1	0	0	0	1	1	1	62.50%
Phocaeicola vulgatus	1	1	0	0	0	1	1	1	62.50%
Blautia unknown_species	1	1	0	0	0	0	1	1	50.00%
Parabacteroides unknown_species	1	0	0	0	1	0	1	1	50.00%
Gemmiger unknown species	1	0	0	0	1	0	1	1	50.00%

**Table S3:** The 10 highest species according to the overall ranking for group G3.

Species	ABO	AWO	RBD	RWD	IOBD	IOWD	MM	CM	Score
Faecalibacterium prausnitzii	1	1	0	0	1	1	1	1	75%
Faecalibacterium unknown_species	1	1	0	0	1	1	1	1	75%
Eubacterium rectale	1	1	0	0	1	1	1	1	75%
Eubacterium unknown_species	1	1	0	0	1	1	1	1	75%
Roseburia unknown_species	1	1	0	0	1	1	1	1	75%
Roseburia inulinivorans	1	1	0	0	1	1	1	1	75%
Blautia unknown_species	1	1	0	0	0	1	1	1	63%
Ruminococcus unknown_species	1	1	0	0	0	1	1	1	63%
Lachnospira unknown_species	1	0	0	0	1	1	1	1	63%
Gemmiger unknown_species	1	0	0	0	1	1	1	1	63%

**Table S4:** The 10 highest species according to the overall ranking for group G4.

Species	ABO	AWO	RBD	RWD	IOBD	IOWD	MM	CM	Score
Intestinimonas unknown_species	1	0	0	0	1	1	1	1	63%
Faecalibacterium prausnitzii	1	1	0	0	0	1	1	1	63%
Faecalibacterium unknown_species	1	1	0	0	0	1	1	1	63%
Ruminococcus unknown_species	1	1	0	0	0	1	1	1	63%
Bacteroides uniformis	1	1	0	0	0	1	1	1	63%
Gemmiger unknown_species	1	0	0	0	1	1	1	1	63%

Blautia unknown_species	1	1	0	0	0	0	1	1	50%
Agathobaculum butyriciproducens	1	0	0	0	1	0	1	1	50%
Eubacterium rectale	1	1	0	0	0	0	1	1	50%
Eubacterium unknown_species	1	0	0	0	0	1	1	1	50%