

Table S8. The classification table from the logistic regression (LR) analysis of the MSN parameters at the host species level [$X=PT$, $Y=$ Probability of Non-Neutral (0) vs. Neutral (1)]

	Estimated Occurrences			
Actual Occurrences	0 (Non-neutral)	1 (Neutral)	Total	
0 (Non-neutral)	101	7	108	
1 (Neutral)	55	16	71	
Total	156	23	179	
Percentage Correctly Classified = 65.4%				
Parameters from the LT of the PT-Neutrality Relationship (Reference Group $Y=0$ or Non-neutral)				
Variable (Factor)	LR Coefficient (B)	Standard Error of B	P-value of Wald Test	Odds Ratio: Exp (B)
PD (B_1)	0.008*	0.002	0.0016	1.007
Intercept (B_0)	-0.812	0.196	<0.0001	0.444

*The positive LR coefficient corresponding the PD suggests that more ancient species (with larger PD) are more likely to host non-neutral gut microbiome and more recent species such as humans are more likely to host neutral microbiomes.