**Supporting Information**

**Electrostimulation triggers an increase in cross-niche microbial associations toward enhancing organic nitrogen wastewater treatment**

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Methods

Wolf’s vitamin solution contained the following vitamins (in milligrams) per liter of distilled water: biotin, 20; folic acid, 20; pyridoxine hydrochloride, 100; riboflavin, 50; thiamine, 50; nicotinic acid 50; pantothenic acid, 50; vitamin B12, 1; p-aminobenzoic acid, 50; thioctic acid, 50.

Wolf’s trace elements solution contained the following amounts (in grams) of salts per liter of distilled water: nitrilotriacetic acid, 15; MgSO4, 30; MnSO4, 5; NaCl, 10; FeSO4, 1; CaCl2, 1; CoCl2, 1; ZnSO4, 1; CuSO4, 0.1; AlK(SO4)2, 0.1; H3BO3, 0.1; Na2MoO4, 0.1.

Results



**Fig. S1.** AYR degradation and PPD formation for planktonic sludge (a) and electrode biofilm (b)

**Fig. S2.** Comparison of relative abundance at the genus level for HA and eHA (Kruskal-Wallis H test, \*: *P* < 0.05, \*\*: *P* < 0.01).

 **Fig. S3.** Correlation analysis between the AYR degradation rate and the relative abundances of dominant genera.



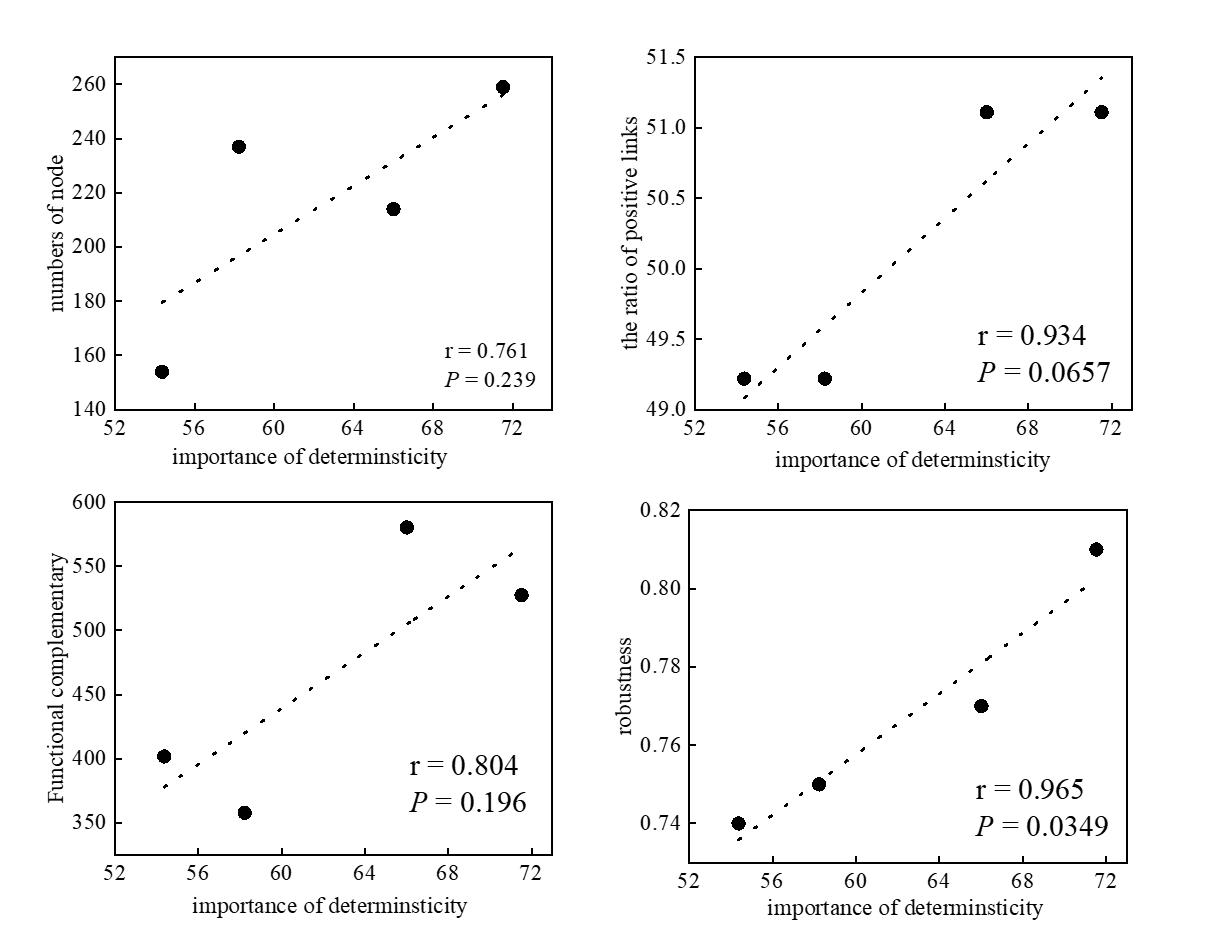
**Fig. S4.** Microbial networks of planktonic sludge and electrode biofilm under electrostimulation (eHA) and control (HA), different modules are shown in different colors.



**Fig. S5.** Subnetworks of dominant genera interactions and topological parameters (green links stand for positive associations and red links stand for negative associations).



**Fig. S6.** Cross-niche microbial networks and classification of nodes to identify putative keystone taxa within networks for HA (a, c) and eHA (b, d), green links stand for positive associations and red links stand for negative associations.



**Fig. S7.** Correlation analysis between the biotic factors and the relative importance of deterministic assembly.