

Supplementary Data

Effect of C/N ratio on biodegradation of ciprofloxacin and denitrification from Low

C/N wastewater by a novel 3D-BER System

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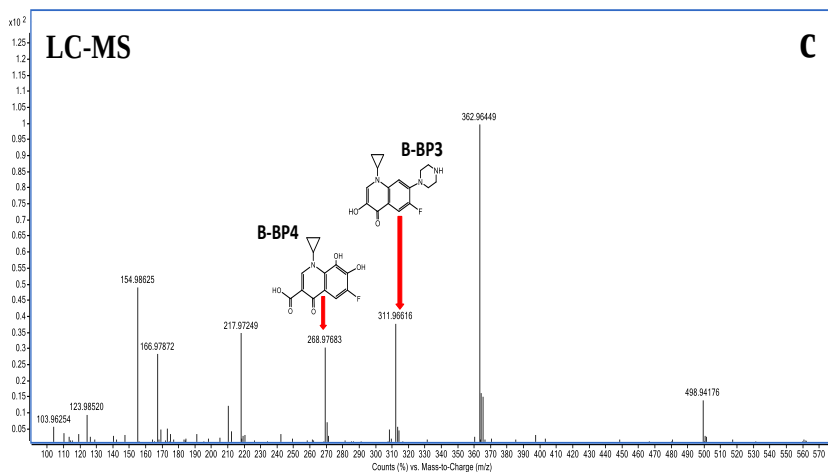
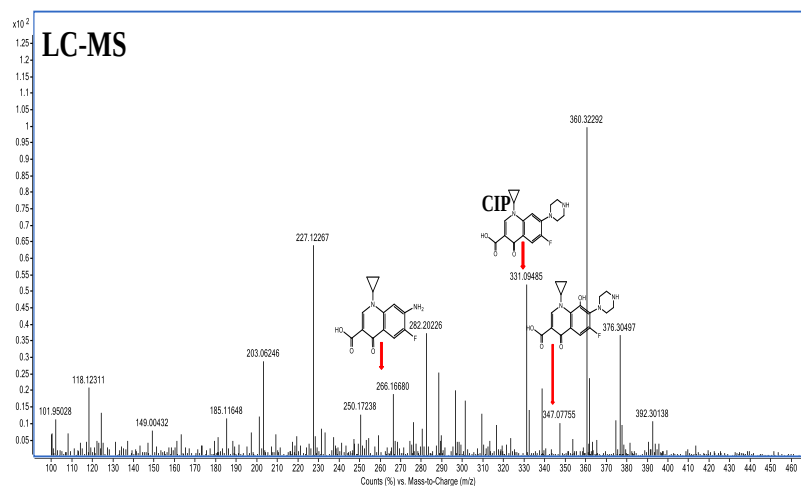
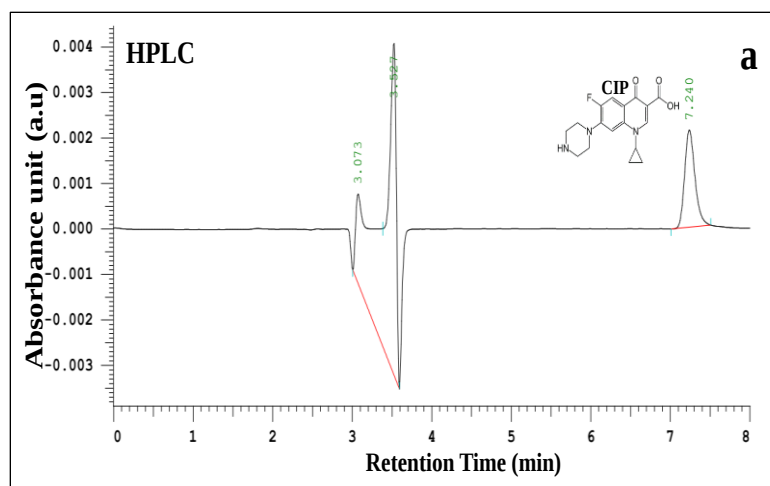
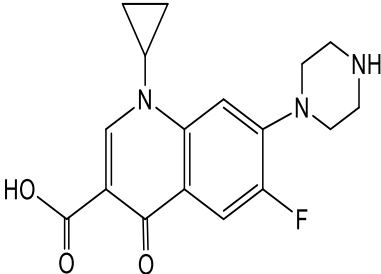
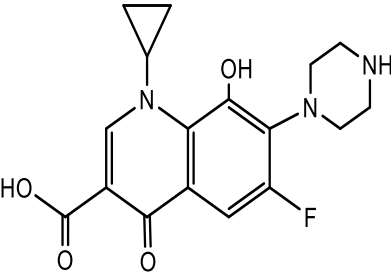
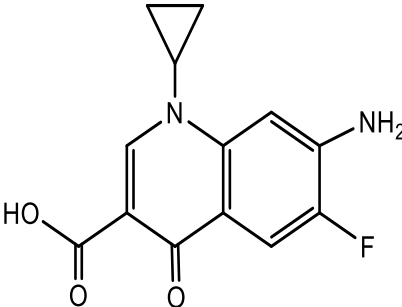
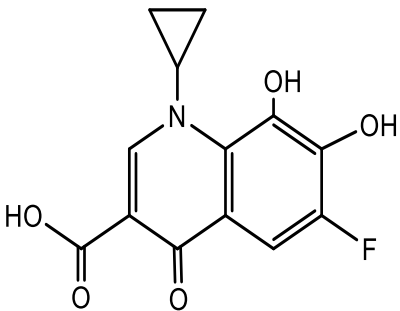
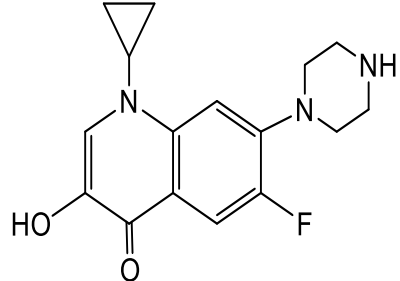


Fig.S1 Mass spectra of biodegradation of ciprofloxacin: Ciprofloxacin ($m/z=331.094$) and by-products: CIP-BBP1 ($m/z=331.094$); CIP-BBP2 ($m/z=266.166$); CIP-BBP3 ($m/z=268.976$); CIP-BBP4 ($m/z=311.96$)

Table S1. Antibiotics Ciprofloxacin postulated biodegradation metabolites in 3D-BERS, as determined by HPLC-LC-MS/MS

Product ID	RT (min)	[M+H] ⁺ (m/z)	Proposed Molecular formulas	Proposed breakpoint	LC-MS/MS (m/z)	Proposed Structure
CIP	7.240	331.094	C ₁₁ H ₈ FN ₂ O C ₁₂ H ₈ FN ₂ O ₂ C ₁₄ H ₁₄ FN ₂ O C ₁₆ H ₁₉ FN ₃ O C ₁₇ H ₁₇ FN ₃ O ₂	-2H ₂ O, -CO, -C ₃ H ₅ , C ₂ H ₄ N -C ₂ H ₄ N, -H ₂ O, -C ₃ H ₅ , -C ₂ H ₅ N, -CO ₂ , -CO ₂ , - H ₂ O	200.97 238.18 227.12 281.15 321.17	
CIP -BBP1	9.61	347.077	C ₁₁ H ₆ FN ₂ O ₂ C ₁₂ H ₇ FN ₂ O ₂ C ₁₇ H ₁₇ FN ₃ O ₃	-H ₂ O, -C ₃ H ₅ , -C ₂ H ₆ N, -CO -2H ₂ O, -C ₃ H ₄ , C ₂ H ₄ N -H ₂ O	188.61 200.97 321.17	
CIP -BBP2	10.63	266.166	C ₁₀ H ₅ FN ₂ O ₂ C ₁₂ H ₁₀ FN ₂ O C ₁₃ H ₁₀ FN ₂ O ₂	-H ₂ O, -C ₃ H ₅ -H ₂ O, -CO -H ₂ O	185.11 203.06 250.17	

CIP –BBP3	11.78	268.97683	$C_9H_4FNO_2$ $C_{13}H_{15}NO_2$ $C_{11}H_4FO_4$ $C_{13}H_8FNO_3$	-H ₂ O, -CO, -C ₃ H ₄ -2H ₂ O, -HF -C ₂ H ₆ N -H ₂ O	152.89 207.31 238.61 261.15	
CIP –BBP4	8.528	311.96616	$C_{10}H_7FN_2$ $C_{12}H_{12}FN_3$ $C_{14}H_{13}FN_2O_2$ $C_{16}H_{16}FN_3O$	-H ₂ O, -CO, -C ₃ H ₄ , -C ₂ H ₅ N, -H ₂ O, -CO, -C ₃ H ₄ , -C ₂ H ₅ N -H ₂ O	101.95 250.17 282.20 299.19	

CIP-BBP: Ciprofloxacin Biodegradation By-products Pathways

Accurate masses of [M+H]⁺, and chemical structures of Ciprofloxacin (m/z=331.094) and by-products: CIP-BBP1 (m/z=331.094); CIP BBP2 (m/z=266.166); CIP-BBP3 (m/z=268.976); CIP-BBP4 (m/z=311.96).