

## Supplementary Information

### **Fluorescent properties of dissolved organic matter as a function of hydrophobicity and molecular weight? Case studies from two membrane bioreactors and an oxidation ditch**

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RSC Advances

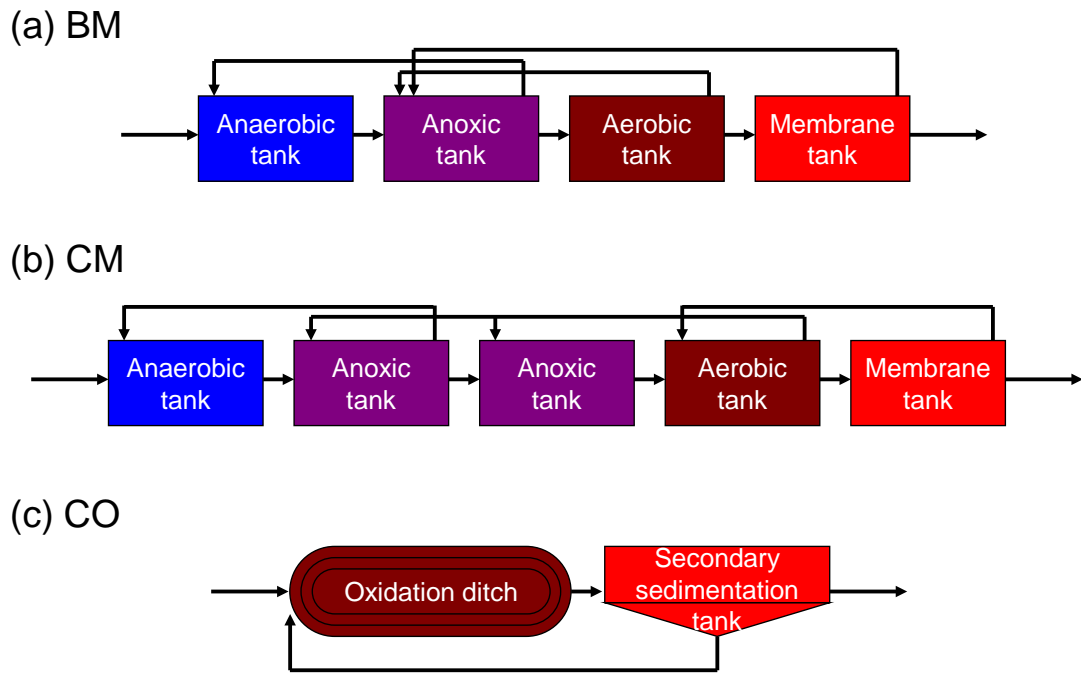
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\* Corresponding author. Tel.: 86-10-62781386.

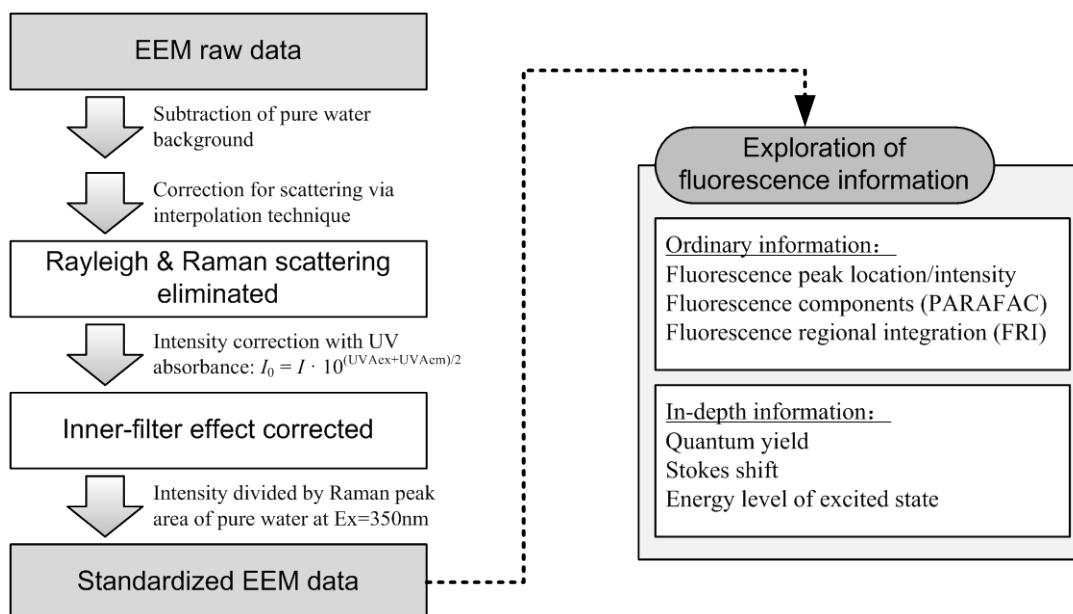
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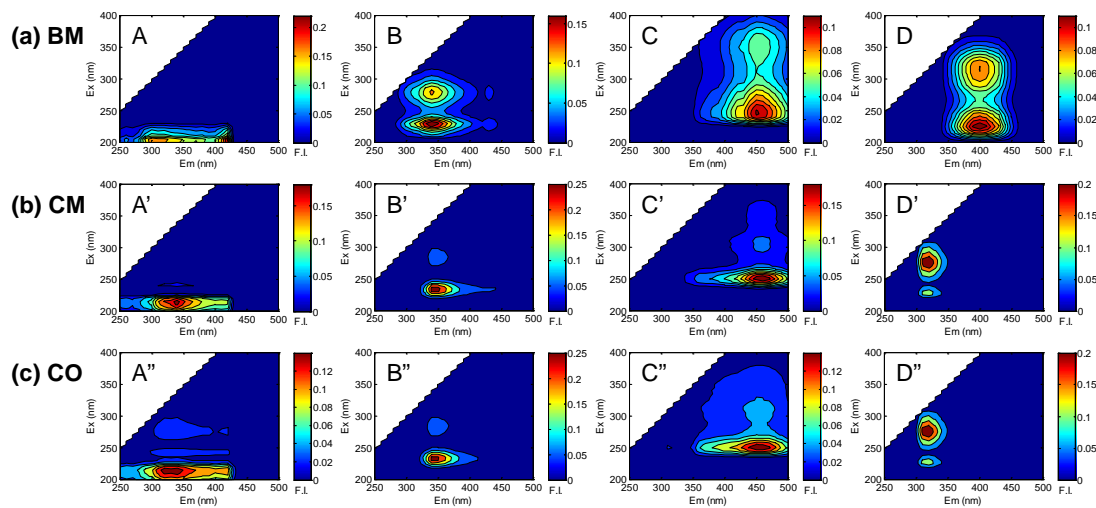
(X. Huang).



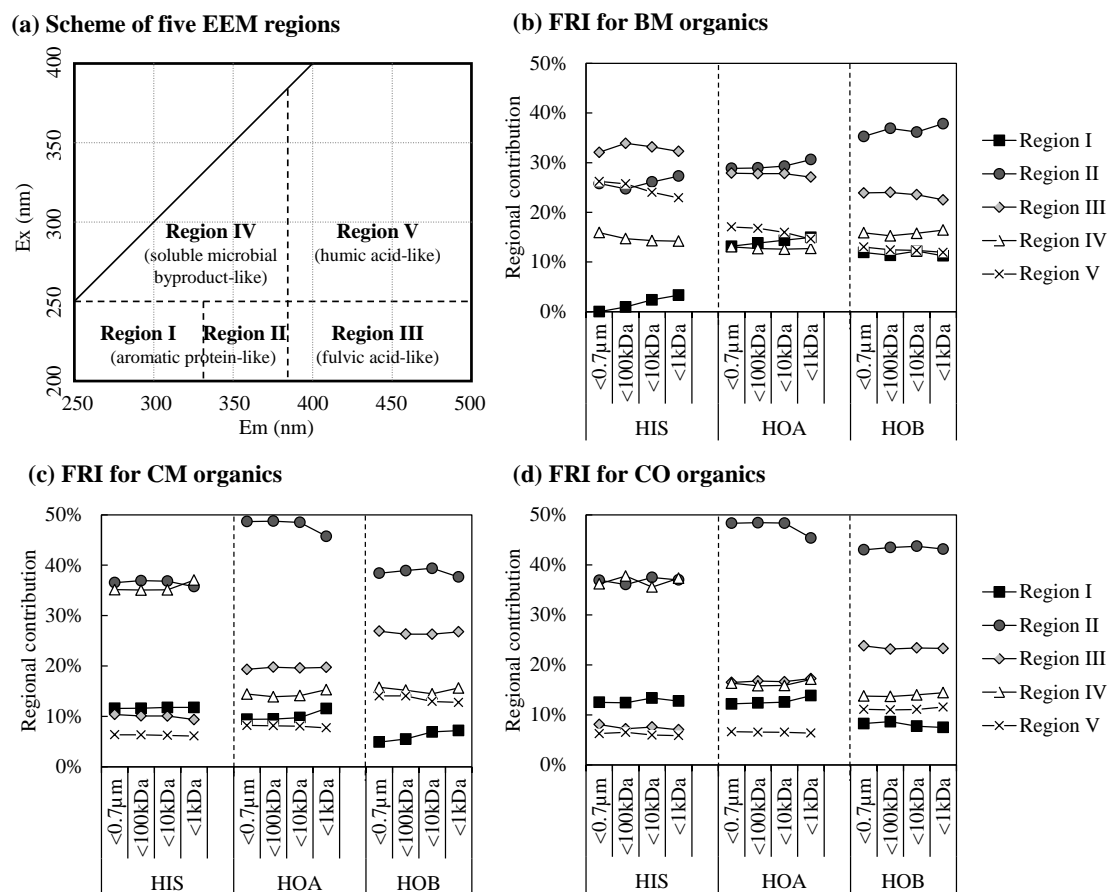
**Fig. S1.** Process flow of the three wastewater treatment plants for case studies. BM and CM are based on membrane bioreactor, while CO based on oxidation ditch.



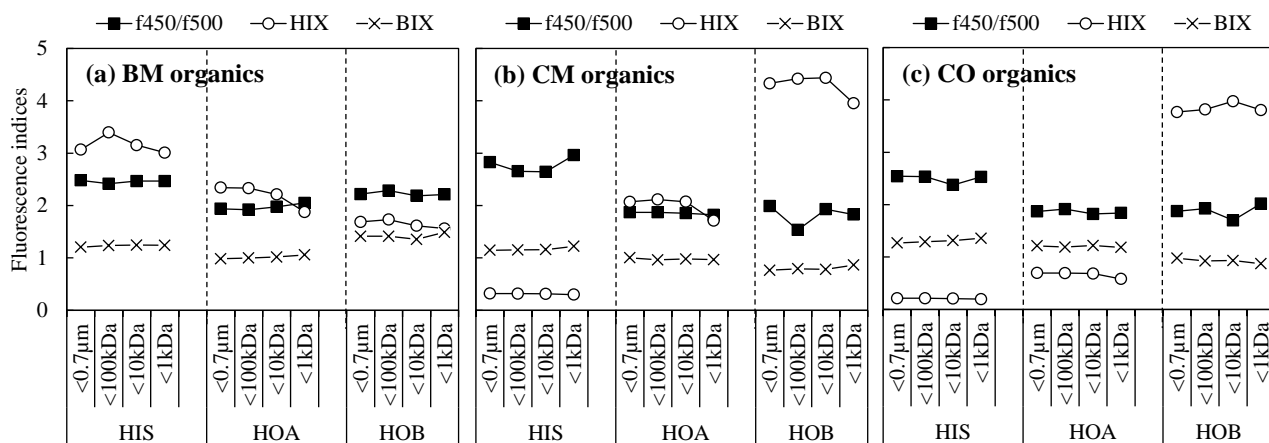
**Fig. S2.** Protocol for EEM data processing and fluorescence information exploration.



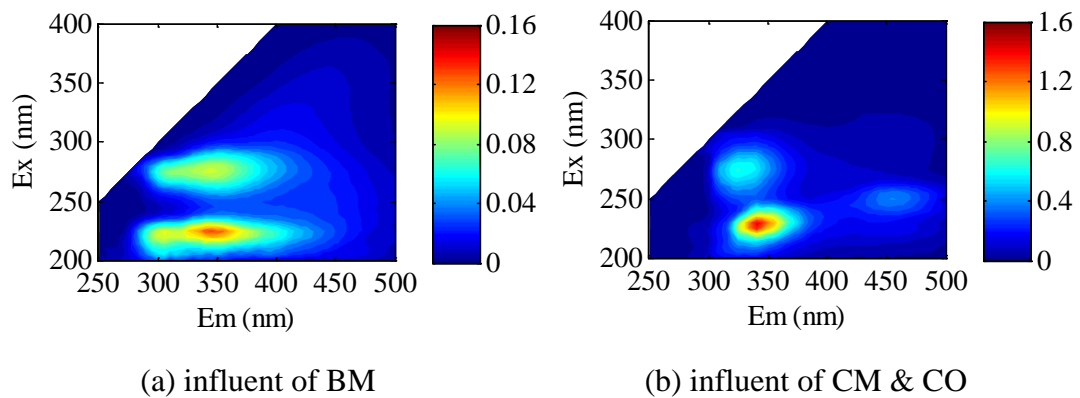
**Fig. S3.** Fluorescence components of DOM from the three wastewater treatment plants, based on PARAFAC analysis.



**Fig. S4.** Fluorescence regional integration based on EEM spectra of DOM fractions from the BM, CM, and CO plants.



**Fig. S5.** Fluorescence indices ( $f_{450}/f_{500}$ , HIX, and BIX) of DOM fractions from the BM, CM, and CO plants.



**Fig. S6.** EEM spectra of the influent wastewaters of the three wastewater treatment plants. The color bars are scaled by Raman Unit per mgTOC/L.

**Table S1** PARAFAC fluorescent components of DOM from the three wastewater treatment plants.

DOM source	Fluorescent component <sup>a</sup>	Peak location (nm) <sup>b</sup> (Ex/Em)	Contribution rate to overall fluorescence (%)			Possible chemical composition <sup>b</sup>
			HIS	HOA	HOB	
BM	A	<b>(205/300)</b>	0	4	5	<b>Aromatic proteins</b>
	B	<b>(230/340)</b> , (280/340)	12	18	25	<b>Aromatic proteins</b> , microbial byproducts
	C	<b>(245/450)</b> , (350/450)	46	48	40	<b>Fulvic acids</b> , humic acids
	D	<b>(225/400)</b> , (315/410)	42	30	30	<b>Fulvic acids</b> , humic acids
CM	A'	<b>(215/340)</b>	1	14	8	<b>Aromatic proteins</b>
	B'	<b>(235/350)</b> , (285/350)	27	48	34	<b>Aromatic proteins</b> , microbial byproducts
	C'	<b>(250/460)</b> , (310/460)	9	20	39	<b>Humic/fulvic acids</b> , humic acids
	D'	(230/320), <b>(275/320)</b>	63	47	18	Aromatic proteins, <b>microbial byproducts</b>
CO	A''	<b>(215/340)</b>	1	16	10	<b>Aromatic proteins</b>
	B''	<b>(235/340)</b> , (285/340)	27	51	47	<b>Aromatic proteins</b> , microbial byproducts
	C''	<b>(250/450)</b> , (310/450)	6	10	27	<b>Humic/fulvic acids</b> , humic acids
	D''	(225/320), <b>(275/320)</b>	66	23	16	Aromatic proteins, <b>microbial byproducts</b>

<sup>a</sup> The labeled fluorescent components correspond to those in **Fig. S3**.

<sup>b</sup> The primary peak and the corresponding chemical composition are shown in **bold**.



**Table S2** Fluorescence-intensity-weighted average excited energy state (calculated from Fig. 5 as average RMS of Ex and Em (nm)) of DOM fractions from the BM, CM, and CO plants.

Molecular size	BM organics			CM organics			CO organics		
	HIS	HOA	HOB	HIS	HOA	HOB	HIS	HOA	HOB
<0.7 $\mu$ m	362.2	336.2	328.8	312.7	322.4	342.0	312.1	314.5	332.1
<100kDa	359.3	334.9	328.4	312.6	322.5	342.0	312.2	314.3	331.2
<10kDa	355.3	332.7	327.7	312.3	321.7	338.1	311.2	313.9	332.3
<1kDa	352.0	329.1	327.6	311.5	318.9	336.8	310.8	312.3	333.9