Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

Tröger's base-containing fluorenone organic polymer for discriminative fluorescence sensing of sulfamethazine antibiotic at ppb level in the water medium

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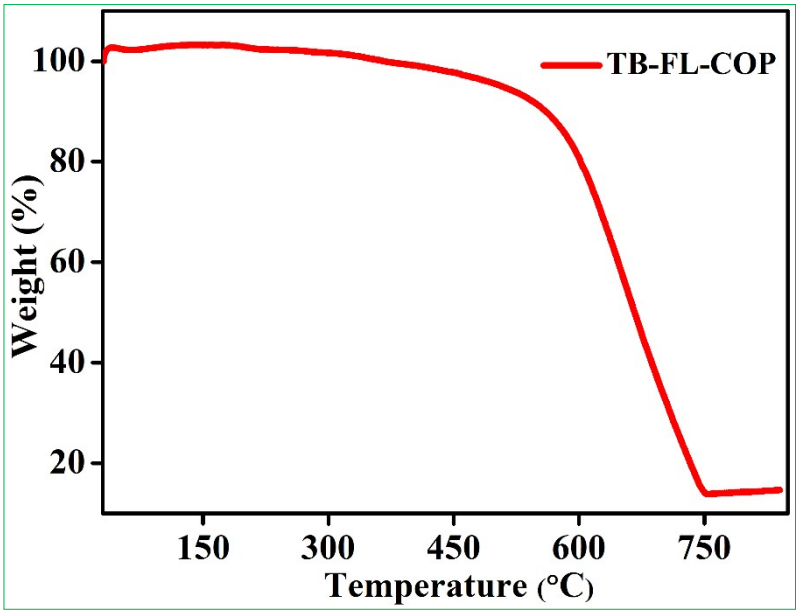


Fig. S1. Thermogravimetric analysis of as-synthesized **TB-FL-CP** was measured under N_2.

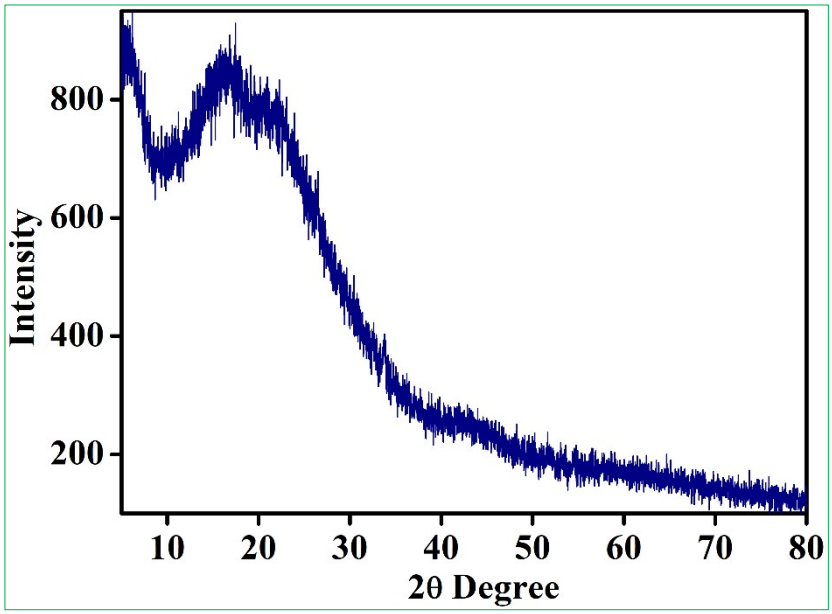


Fig. S2. The powder X-ray diffraction pattern of as-synthesized **TB-FL-CP**.

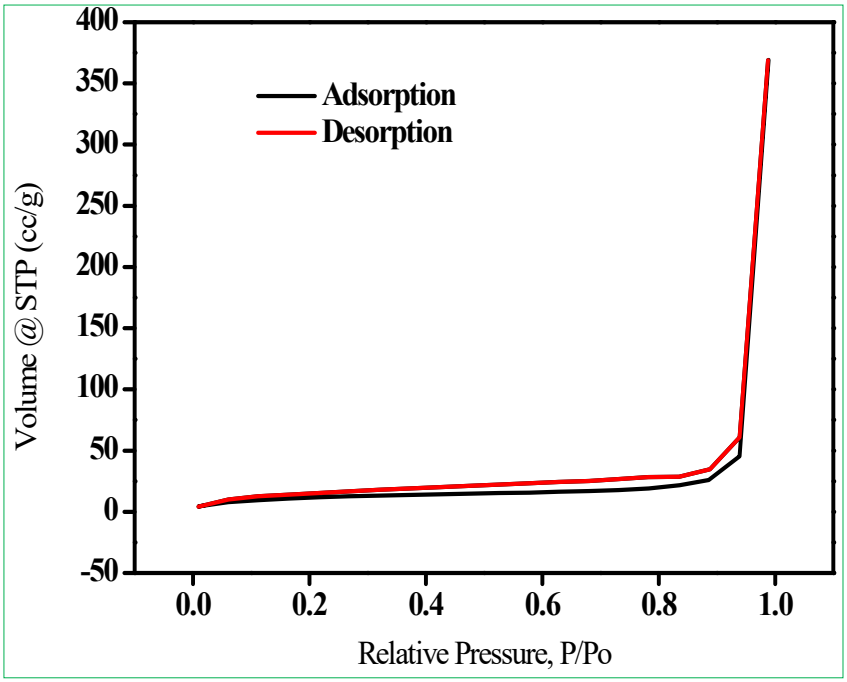


Fig. S3. The N_2 adsorption-desorption isotherm was measured at 77 K for **TB-FL-CP**.

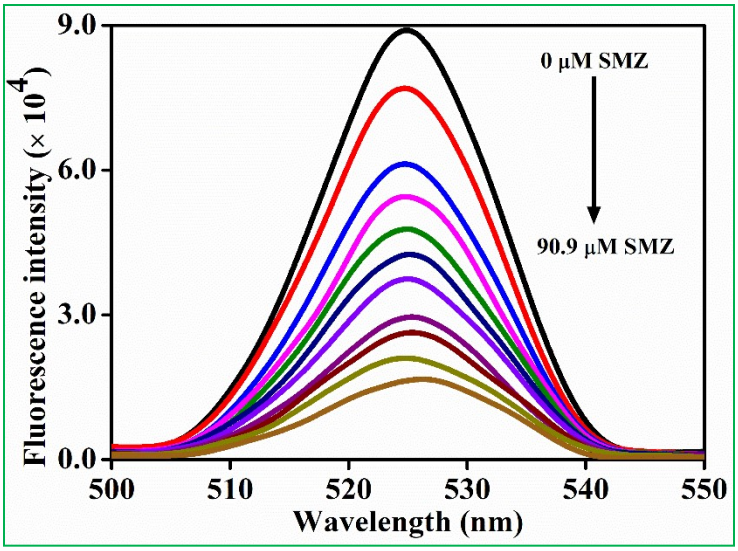


Fig. S4. The observed changes in fluorescence emission intensity of **TB-FL-COP** at different concentrations of SMZ antibiotics were recorded in a PBS buffer medium.

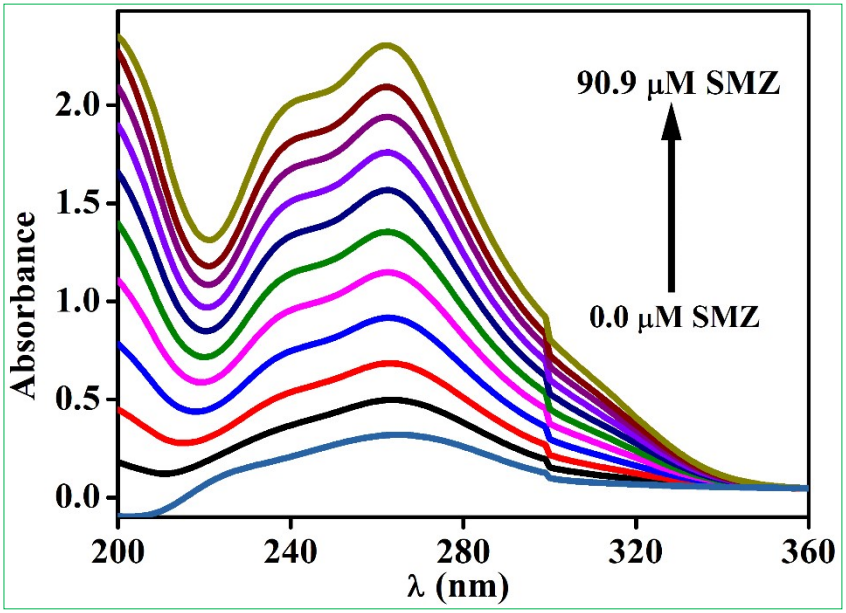


Fig. S5. The changes in electronic absorption spectra for **TB-FL-CP** at different concentrations of SMZ at recorded at room temperature.

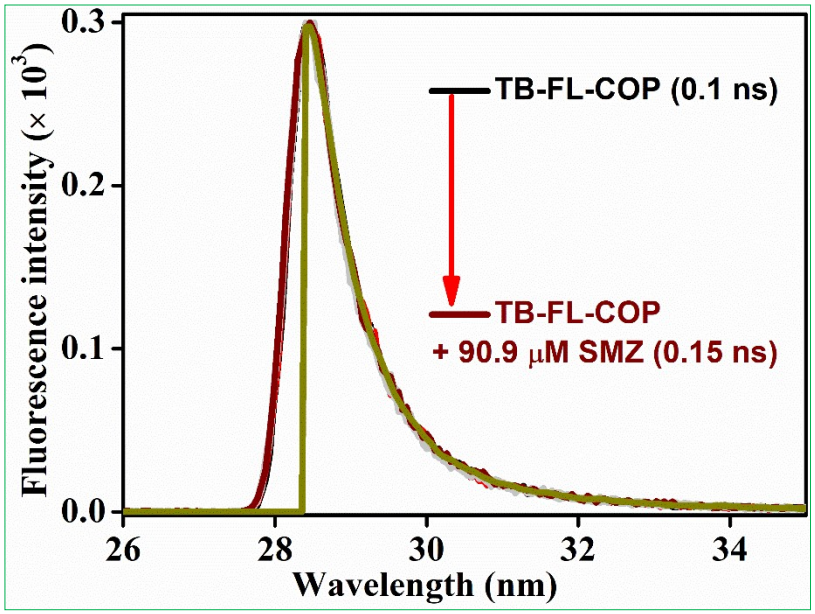


Fig. S6. The time-dependent fluorescence emission study of **TB-FL-COP** before and after the addition of different concentrations of SMZ antibiotics in water.

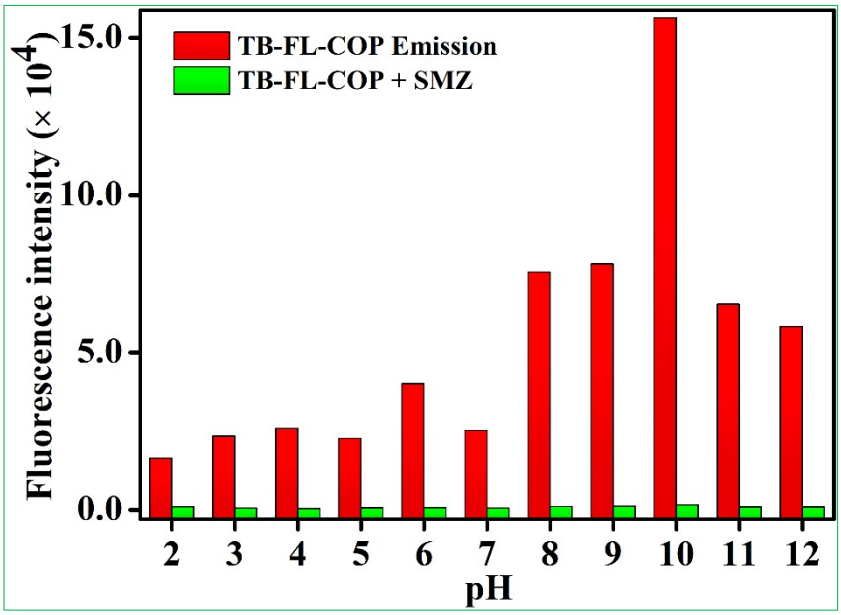


Fig. S7. The fluorescence emission for **TB-FL-CP was** recorded at different pH of the medium and observed fluorescence quenching after the addition of SMZ antibiotics.

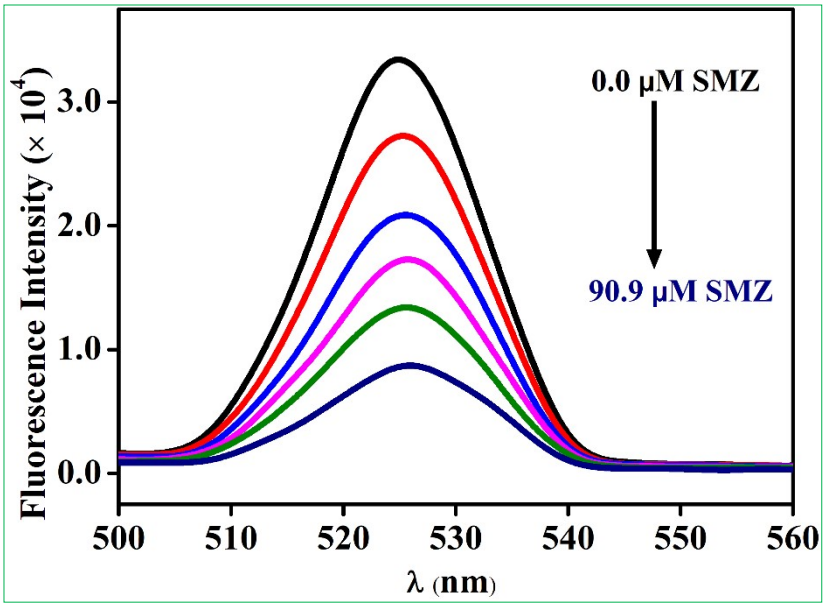


Fig. S8. The changes in fluorescence emission intensity of **TB-FL-COP** at different concentrations of SMZ antibiotics were measured in pond water collected from Ahalia Campus, Palakkad.

Table S1. The structure and calculated K_{SV} value for different antibiotics.

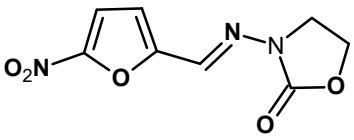
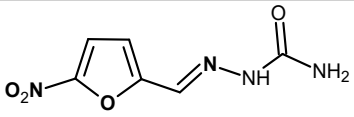
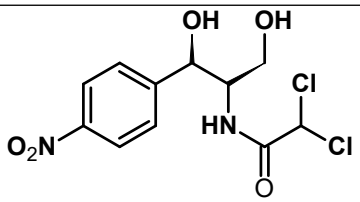
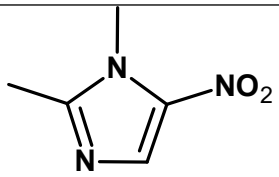
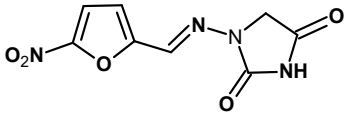
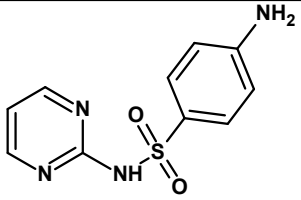
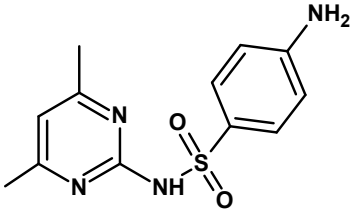
S. No.	Antibiotics	Structure of Antibiotics	Quenching constant (K_{SV})
1	Furazolidone		4.9×10^3 M^{-1}
2	Nitrofurazone		4.1×10^4 M^{-1}
3	Chloramphenicol		2.5×10^4 M^{-1}
4	Dimetridazole		5.6×10^3 M^{-1}
5	Nitrofurantoin		2.6×10^4 M^{-1}
6	Sulfadiazine		4.8×10^4 M^{-1}
7	Sulfamethazine		1.2×10^6 M^{-1}

Table S2. The calculated HOMO and LUMO energies for **TB-FL-COP** and various antibiotics.

Compounds	HOMO (eV)	LUMO (eV)
TB-FL-COP	-5.17	-1.04
SMZ	-6.29	-1.32
NFZ	-6.74	-3.11
SDZ	-6.35	-1.61
CRP	-7.86	-3.00
FZD	-6.86	-3.21
DMZ	-7.30	-2.76
FLP	-7.35	-4.10

Table S3. Fluorescence sensing properties of various senors system reported todate for SMZ.

Detection Method and Materials	LOD	[Ref.]
HPLC	3 ng mL^{-1}	[1]
Fluorometry	10 ng mL^{-1}	[2]
Capillary electrophoresis	1.1 ng mL^{-1}	[3]
Fluorometric and chirality aptasensing	0.02/0.75 ng mL^{-1}	[4]
Molecularly imprinted polymer on upconverting nanoparticles fluorescence sensing	34 ng mL^{-1}	[5]
Lateral flow immunoassay based on dual spectral-overlapped fluorescence quenching of polydopamine nanospheres	0.043 and 0.5 ng/mL	[6]
Supramolecular Cd(II)-Coordination Polymer as a Luminescent Sensor	1.05 ppm	[7]
Aptamer-based fluorometric sulfamethazine assay based on the use of graphene oxide quantum dots	5 pg·mL^{-1}	[8]
Graphitic Carbon Nitride Nanosheets Decorated with Strontium Tungstate Nanospheres as an Electrochemical Transducer	0.0059 μM	[9]
Lanthanide Organic Framework	0.6554 μM	[10]
A fluorescence sensor probe based on porous carbon, molecularly imprinted polymer and graphene quantum dots	0.03 μg L^{-1}	[11]

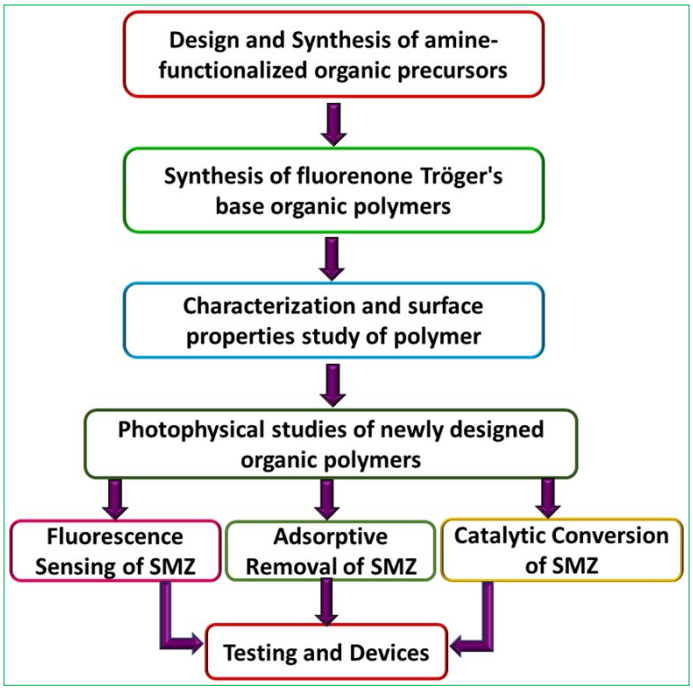


Chart 1: Evolution of the proposed work described herein from molecular design to programmable outcome to testing and devices.

Reference

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