Electronic Supplementary Information

Molecularly Imprinted Antibiotic Receptor on Magnetic Nanotube for Detection and Removal of Environmental Oxytetracycline

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Synthesis of Allyl Rhodamine B

For the synthesis of allyl rhodamine B (ARhB), 2.4g RhB, 0.73g 3-bromopropylene, 2.65g Na_2CO_3, trace hydroquinone and iodine were dissolved in 60mL dry DMF, stirred evenly and heated. Under N_2 atmosphere, the reaction was carried out at 71℃ in the dark for 25h. Then impurities were removed from the mixture, and DMF was evaporated by distillation under reduced pressure. The ARhB (yield: ~70%) was obtained after separation and purification through a chromatography column (dichloromethane/methanol, 40/1, v/v).

Synthesis of 4-(2-acrylamidoethylcarbamoyl)-3-fluorobenzeneboronic acid

For 4-(2-acrylamidoethylcarbamoyl)-3-fluorophenylboronic acid (AFPBA) synthesis, 5g 4-carboxy-3-fluorophenylboronic acid was added to 50mL thionyl chloride and refluxed for 6h under argon atmosphere. After evaporating thionyl chloride under vacuum, the remaining solid and 9.4g N-carboxybenzyloxy-1,2-diaminoethane hydrochloride were dissolved in 90mL THF and placed in an ice water bath. Then, 28mL trimethylamine was slowly added with stirring at room temperature for 6h. After washing with dilute hydrochloric acid, the organic layer was evaporated, producing a white solid. Afterward, the produced white solid was dissolved in 400mL ethanol followed by 10% Pd/C (1 g) addition. They were hydrogenated at 40℃ for 3h. Then, the mixture was filtered and evaporated using a rotary evaporator, then dissolved in 150 mL of sodium carbonate aqueous solution (100 mM, pH=10) in an ice bath. 4.0 mL of acryloyl chloride was slowly added with stirring for 6h at room temperature. Afterward, the mixture was acidified to pH 2 with HCl. At the end, the final AFPBA was recrystallized in acetone and dried in a vacuum (yield: ~45%).

Characterization of ARhB

^{1}H NMR (400 MHz, CD_2Cl_2) δ 8.30 (m, 1H), 7.83 (s, 1H), 7.75 (m, 1H), 7.45-7.00 (m, 3H), 6.89 (dt, *J* = 9.5, 2.5 Hz, 2H), 6.80 (dd, *J* = 22.1, 2.5 Hz, 2H), 5.73 (d, *J* = 10.4, 5.8 Hz, 2H), 5.60-5.33 (m, 1H), 5.24-5.06 (m, 2H), 4.52 (ddd, *J* = 8.5 Hz, 2H), 3.83 – 3.33 (m, 8H), 1.73-1.22 (m, 12H).

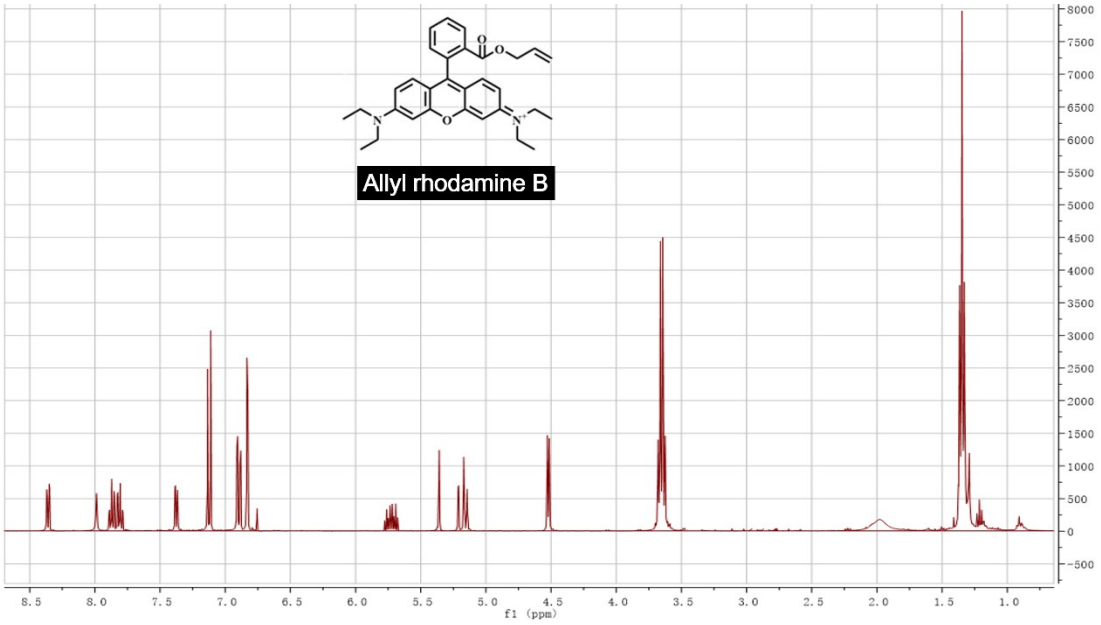

Figure S1. ^{1}H NMR spectra of ARhB.

Characterization of AFPBA

^{1}H NMR (400 MHz, DMSO) 8.40 (s, 2H, $B(OH)_2$), 8.21 (m, 1H, -CO-NH-), 7.70-7.49 (3H, Ar-H), 6.21 (m, 2H, $-CH=CH_2$), 5.60 (d, 1H, $-CH=CH_2$), 3.22-2.51 (m, 4H, $-NHCH_2CH_2NH-$).

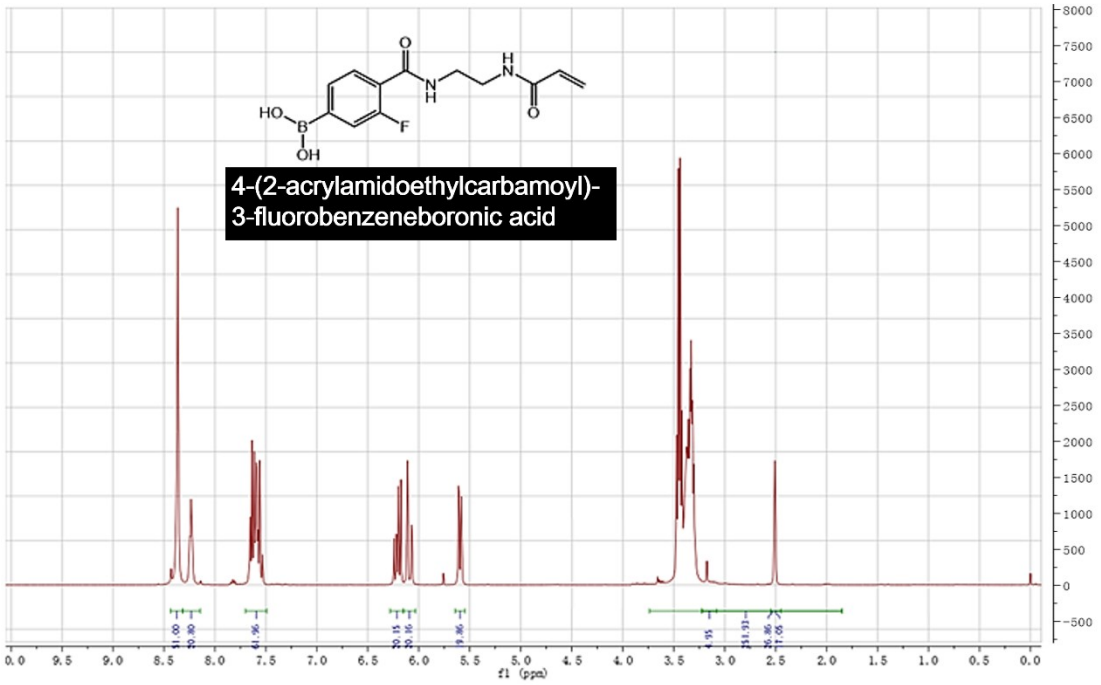

Figure S2. ^{1}H NMR spectra of AFPBA