Supporting Information

for

Turn-on fluorogenic and chromogenic detection of Fe³⁺ and Cr³⁺ in completely water media with polyacrylamide covalent bonding rhodamine B using diethylenetriamine as a linker

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Fig. S1. FTIR spectrum of Rhodamine B-yl diethylenetriamine (RBD).
Fig. S2 FTIR spectrum of N-acryl-N''-(rhodamine B-yl) diethylenetriamine (ARBD).
Fig. S3. $^1$HNMR spectrum of N-acryl-N''-(rhodamine B-yl) diethylenetriamine (ARBD).

$^1$H NMR (400 MHz, CDCl$_3$) of ARBD (d, ppm): 7.398 (m, 1H, Ph) e; 7.366 (m, 2H, Ph) f, g; 7.203 (m, 1H, Ph) h; 6.384-6.304 (m, 4H, Ph) i; 6.254-6.203 (dd, 4H, Ph) j, k; 6.196 -6.061 (m, 1H, =CH$_2$) b; 5.555-5.576 (m, 2H, =CH$_2$) a; 3.883-3.873(s, NH, 1H) c; 3.303-3.252 (m, 1H, NH) d; 3.234 (t, 8H, NCH$_2$) m; 3.206-3.066 (m, 4H, NCH$_2$) l; 2.747-2.711 (m, 4H, NCH$_2$) p; 1.181-1.059 (t, 12H, CH$_3$).
Fig. S4. FTIR spectrum of poly(AM-ARBD).
Fig. S5. $^1$HNMR spectrum of poly(AM-ARBD).

$^1$H NMR (400 MHz, D$_2$O), δ: 0.944–0.979 (m, -CH$_3$) n, 1.031–1.893 (d, -CH$_2$) a, 2.140–2.157 (m, -CH) b, 2.406 (s, -CH$_2$), 3.618–3.564 (d, -CH$_2$-NH, -NH) m, 3.691 (m, -CO-NH$_2$) c, 3.699(d, -CH$_2$-NH–CH$_2$) e, 6.142-6.532 (m, Φ-H) op, 7.079 -7.172 (s, -Φ–H)ijkl, 7.539-7.818(s, -CO-NH-) d, 7.870 (m, Φ-H) h.
Fig. S 6. Linearized responses of poly(AM-ARBD) to Fe$^{3+}$ ($a_1$-$a_2$) or Cr$^{3+}$ ($b_1$-$b_2$) ions.