Supporting Informations for

Luminescent sensor based on Ln(III) ternary complex for NAD(P)H detection

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Content

The high-resolution mass spectra (HR-MS) of chosen Ln(III) ternary complexes

The quenching effect of NADPH compound:
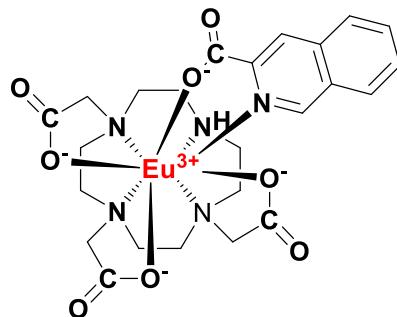
expected mass: **[Eu(DO3A)(IQCA)]⁻** = __668.1236__

observed mass: **[Eu(DO3A)(IQCA)]⁻** = __668.1231__

mass accuracy = 0.7 ppm

$C_{24}H_{29}O_8N_5Eu$ **exact mass: 668.1230**
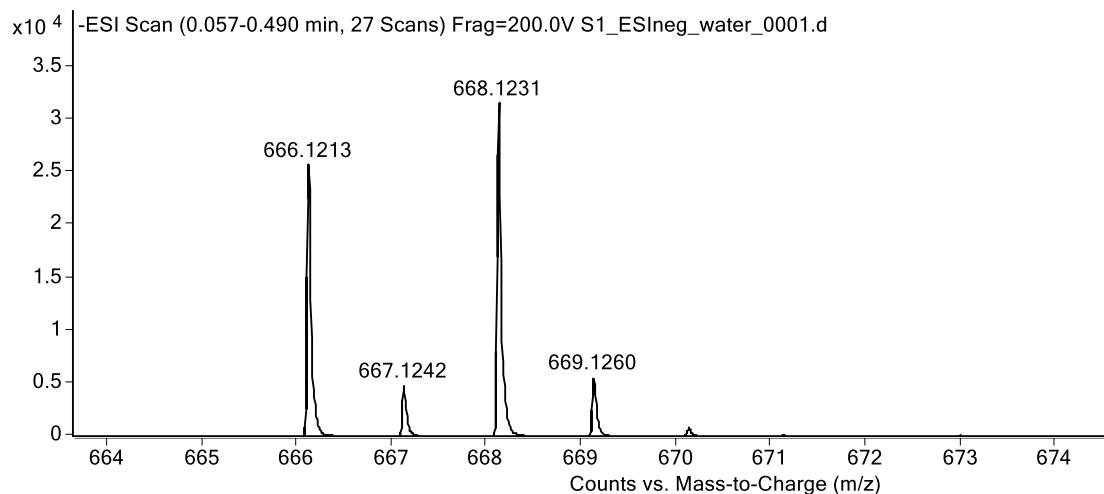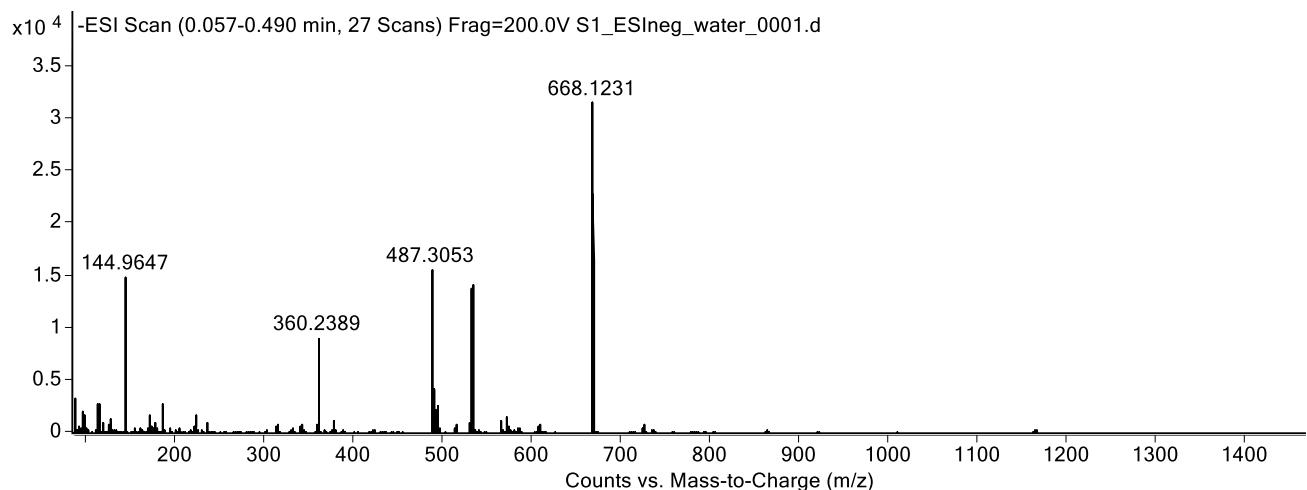
Fig. S1. The HR-MS for ternary [Eu(DO3A)(IQCA)]⁻ complex
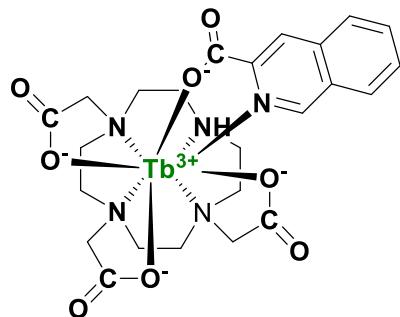
expected mass: **[Tb(DO3A)(IQCA)]$^-$ = <u>674.1275</u>**

observed mass: **[Tb(DO3A)(IQCA)]$^-$ = <u>674.1279</u>**

mass accuracy = - 0.6 ppm

$C_{24}H_{29}O_8N_5Tb$ **exact mass: 674.1270**
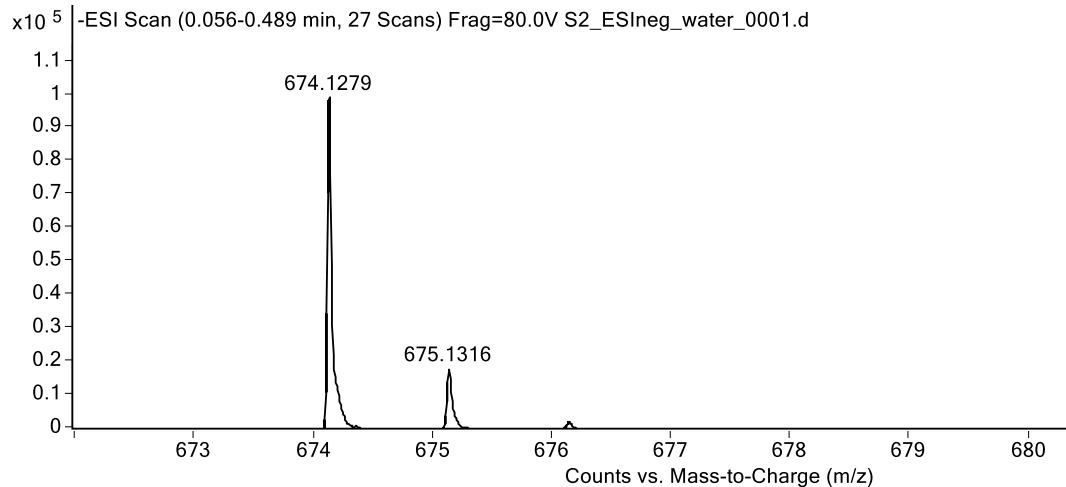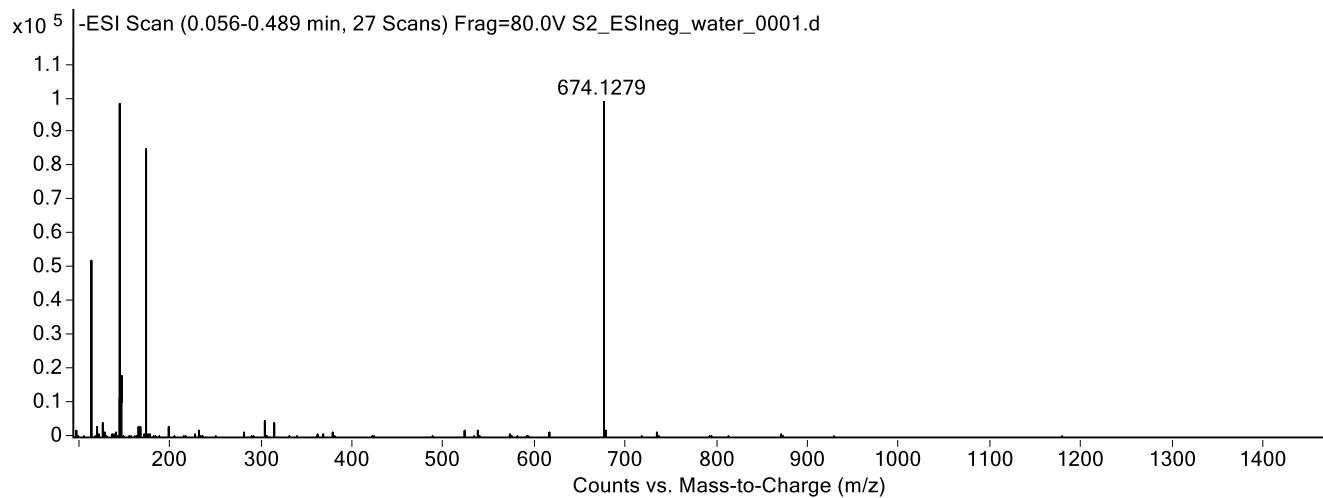
Fig. S2. The HR-MS for ternary [Tb(DO3A)(IQCA)]$^-$ complex
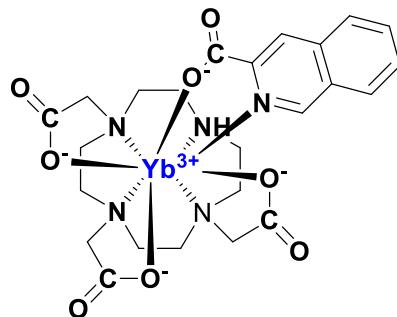
expected mass: **[Yb(DO3A)(IQCA)]**⁻ = **689.1414**

observed mass: **[Yb(DO3A)(IQCA)]**⁻ = **689.1417**

mass accuracy = - 0.4 ppm

$C_{24}H_{29}O_8N_5Yb$ **exact mass: 689.1405**
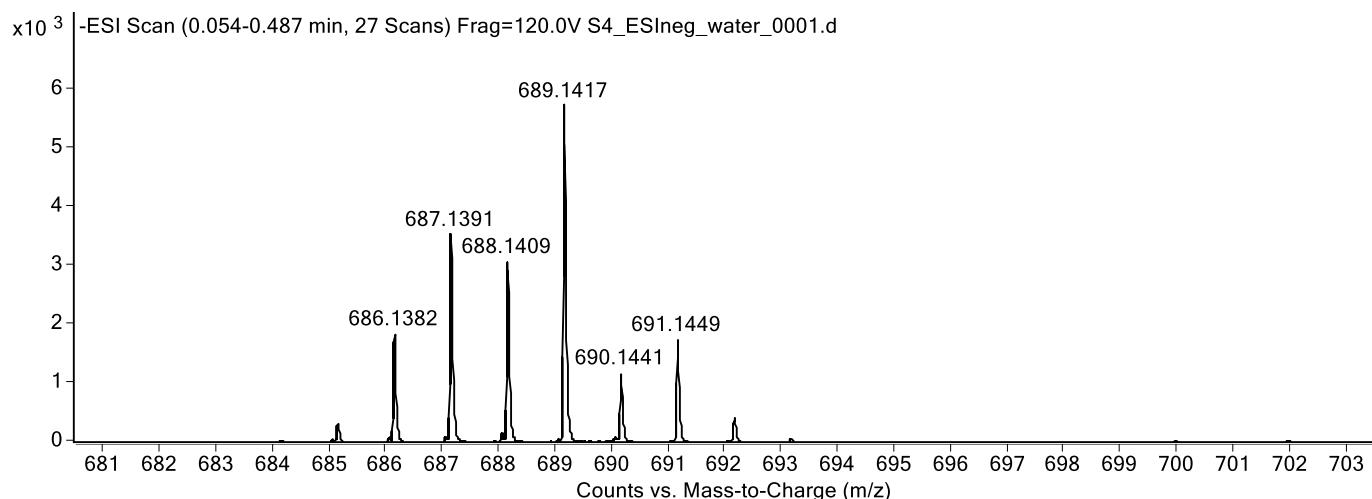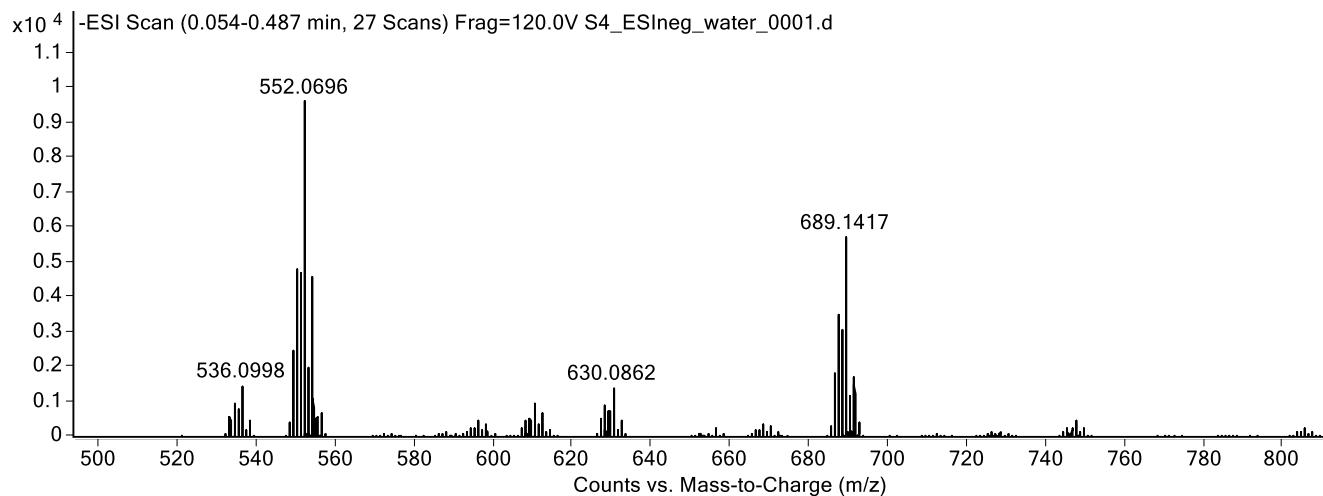
**Fig. S3.** The HR-MS for ternary [Yb(DO3A)(IQCA)]⁻ complex
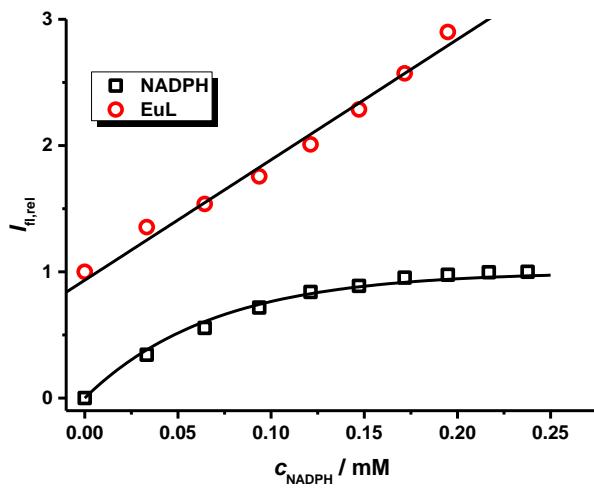
Fig. S4. The quenching effect of NADPH on luminescence intensity of ternary Eu(III) complex with DO3A macrocyclic and IQCA ligands (λ_{exc} = 325 nm, pH = 7.5 (40 mM HEPES), c_{Ln} ~ 0.2 mM, c_{DO3A} ~ 0.3 mM, c_{IQCA} ~ 0.3 mM). λ_{em_NADPH} = 460 nm, λ_{em_EuL} = 618 nm
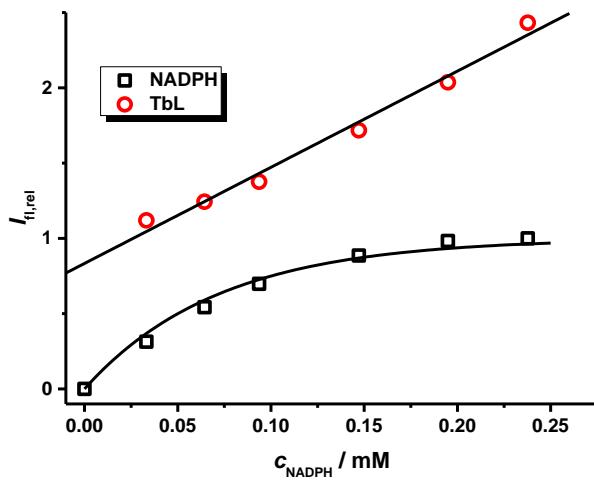

Fig. S5. The quenching effect of NADPH on luminescence intensity of ternary Tb(III) complex with DO3A macrocyclic and IQCA ligands (λ_{exc} = 325 nm, pH = 7.5 (40 mM HEPES), c_{Ln} ~ 0.2 mM, c_{DO3A} ~ 0.3 mM, c_{IQCA} ~ 0.3 mM). λ_{em_NADPH} = 460 nm, λ_{em_TbL} = 545 nm.
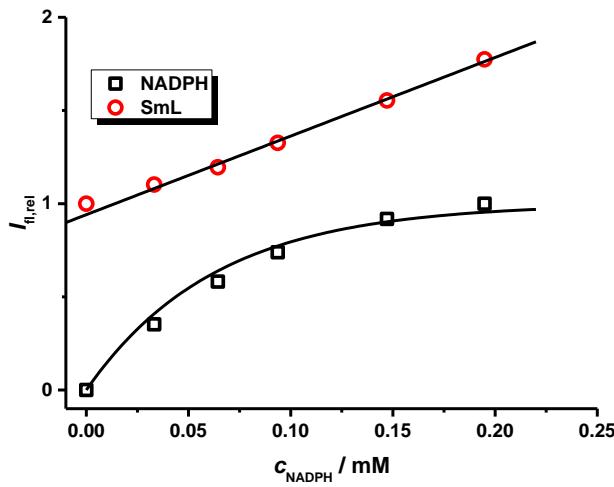
Fig. S6. The quenching effect of NADPH on luminescence intensity of ternary Sm(III) complex with DO3A macrocyclic and IQCA ligands (λ_{exc} = 325 nm, pH = 7.5 (40 mM HEPES), c_{Ln} ~ 0.2 mM, c_{DO3A} ~ 0.3 mM, c_{IQCA} ~ 0.3 mM). λ_{em_NADPH} = 460 nm, λ_{em_SmL} = 597 nm
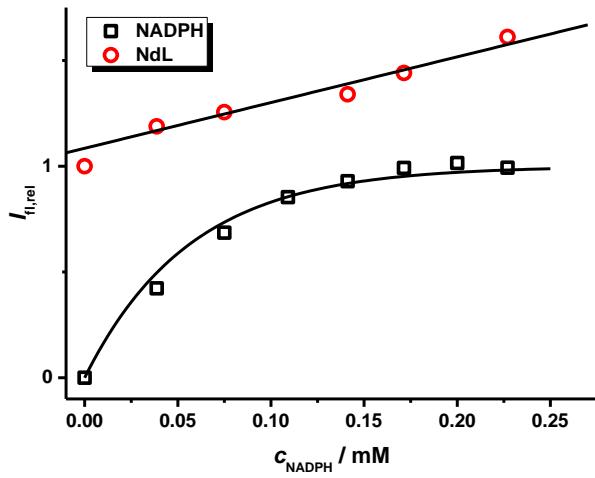

Fig. S7. The quenching effect of NADPH on luminescence intensity of ternary Nd(III) complex with DO3A macrocyclic and IQCA ligands (λ_{exc} = 325 nm, pH = 7.5 (40 mM HEPES), c_{Ln} ~ 0.2 mM, c_{DO3A} ~ 0.35 mM, c_{IQCA} ~ 0.2 mM). λ_{em_NADPH} = 460 nm, λ_{em_NdL} = 880 nm.
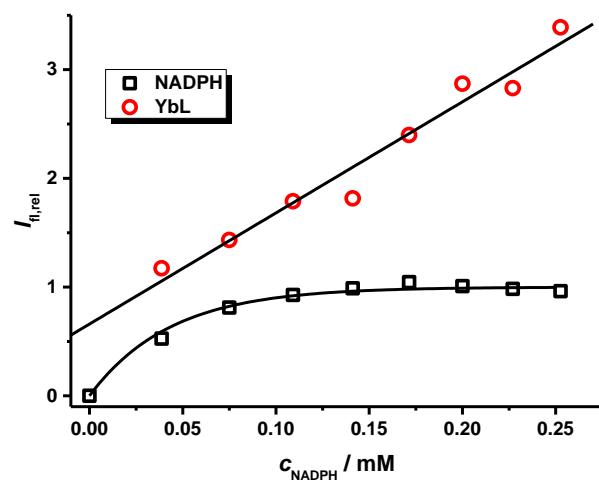
Fig. S8. The quenching effect of NADPH on luminescence intensity of ternary Yb(III) complex with DO3A macrocyclic and IQCA ligands (λ_{exc} = 325 nm, pH = 7.5 (40 mM HEPES), c_{Ln} ~ 0.2 mM, c_{DO3A} ~ 0.35 mM, c_{IQCA} ~ 0.2 mM). λ_{em_NADPH} = 460 nm, λ_{em_YbL} = 980 nm
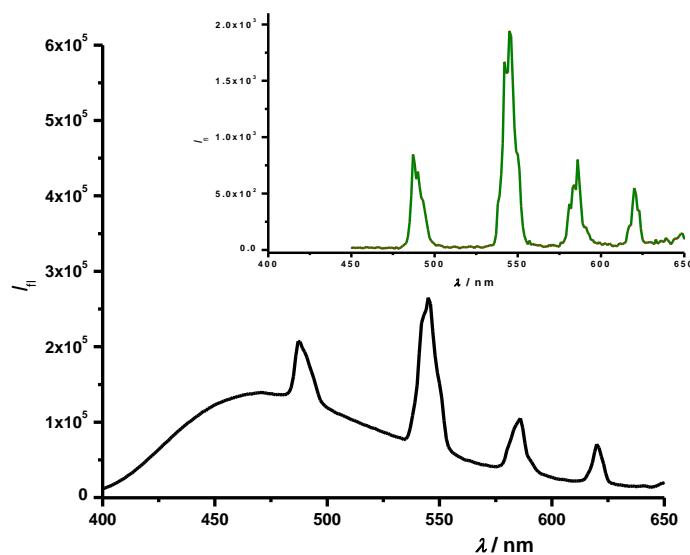

Fig. S9. The emission spectra of ternary Tb(III) complex with DO3A macrocyclic and IQCA ligands in presence of NADPH compound (λ_{exc} = 325 nm, pH = 7.5 (40 mM HEPES), c_{Tb} ~ 0.2 mM, c_{DO3A} ~ 0.35 mM, c_{IQCA} ~ 0.2 mM). The corrected spectra have not been gated (lower picture) while upper in inset were gated by Δt = 50 ms.
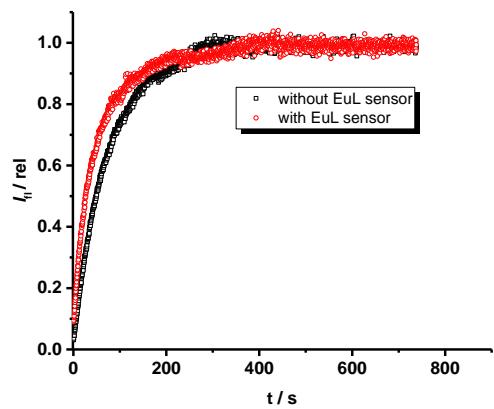
Fig. S10 The example of time trace of fluorescence intensity for enzymatic reaction under the same experimental conditions (pH = 8.0, c_{EtOH} = 0.1 M, c_{EuLZ} = 0.1 mM, c_{NAD} = 0.1 mM, λ_{exc} = 325 nm, λ_{em} = 460 nm