Selection, Identification, and Characterization of Aptamers for Pro-Gastrin-Releasing Peptide (31-98), a Tumor Marker for Small Cell Lung Cancer

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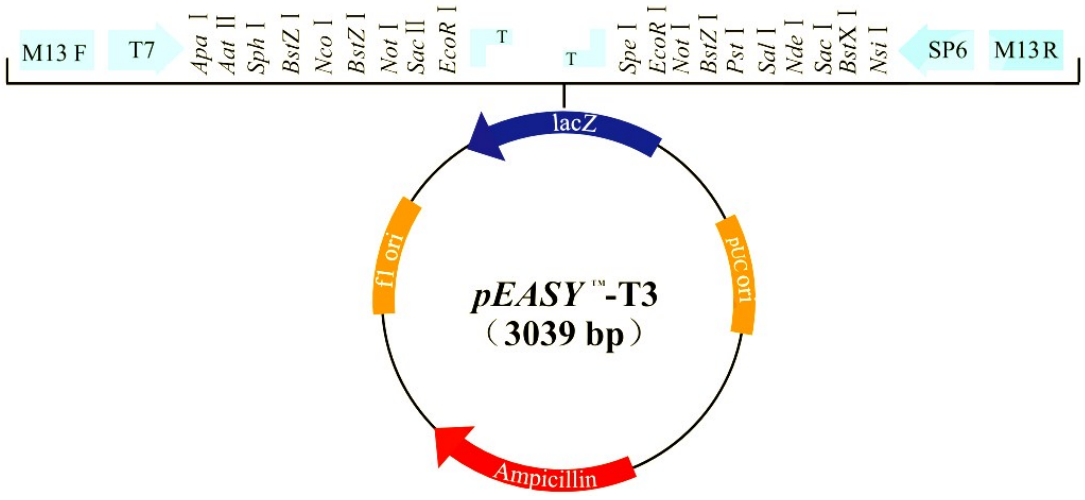
1. In vitro selection, separation and sequence analysis of DNA aptamers for $ProGRP_{31-98}$

The map and the construct of the *pEASY*-T3 cloning vector are shown in Figure S-1.



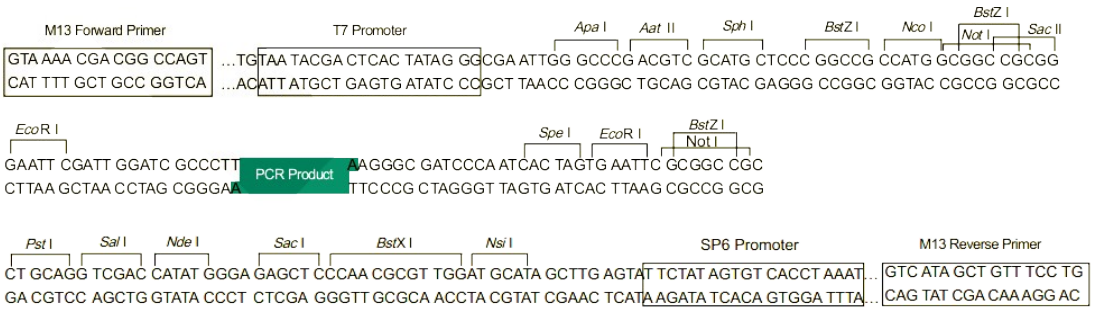


Figure S-1. The map and the construct of the *pEASY*-T3 cloning vector.

2. Affinity assay and aptasensing of the DNA aptamers to ProGRP$_{31\text{-}98}$

The affinities of the aptamer A18, A18', A18'', and A18''' to ProGRP$_{31\text{-}98}$ were investigated. The calibration plot of the FAM labeled A18 fluorescence intensity versus the aptamer concentration, and the plot of $1/C_b$ versus $1/C_0$ of the aptamer A18 in the affinity assay experiment were illustrated (Figure S-2, S-3, respectively).

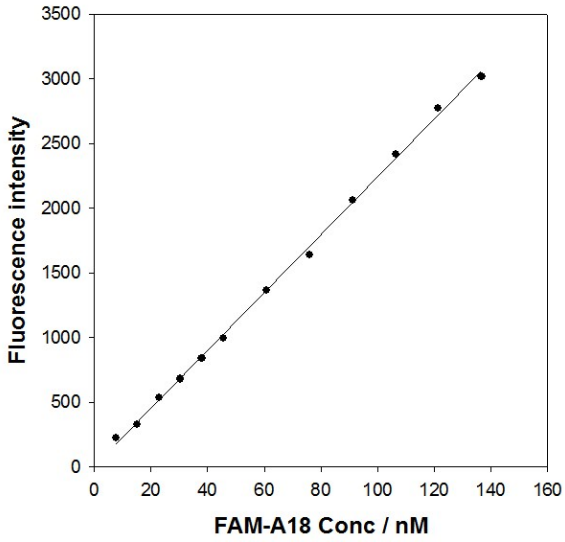


Figure S-2. The calibration plot of the FAM labeled A18 fluorescence intensity versus the aptamer concentration.

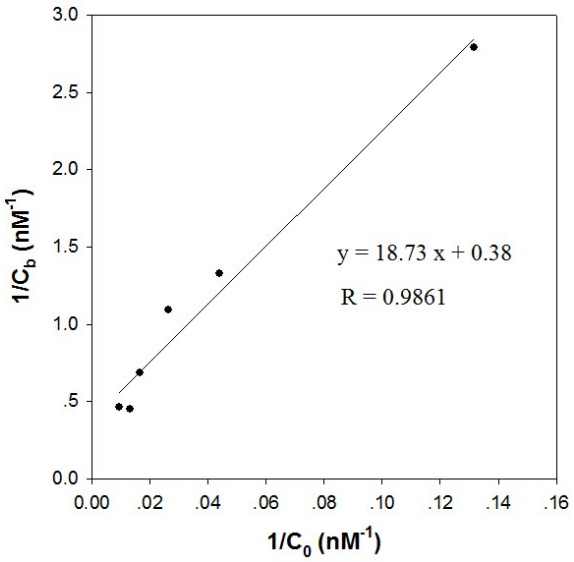
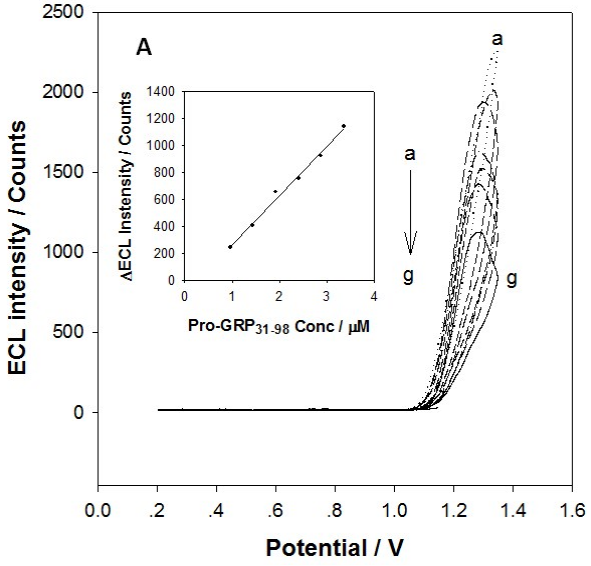


Figure S-3. The plot of $1/C_b$ versus $1/C_0$ of the aptamer A18 in the $ProGRP_{31-98}$ affinity measurement experiment. C_b and C_0 are referred to the aptamer concentration of added and bound, respectively, in the incubation of the $ProGRP_{31-98}$ coated magnetic beads in the aptamer solution.

The obtained aptamers were tentatively applied for label-free aptasensing using ECL measurement with $[Ru(bpy)_2dppz]^{2+}$ as the probe. The ECL intensity—potential curves of the $[Ru(bpy)_2dppz]^{2+}$/aptamer complex under the titration of $ProGRP_{31-98}$ were recorded, and those for A18" and A18'''are illustrated in Figure S-4A and S-4B respectively.



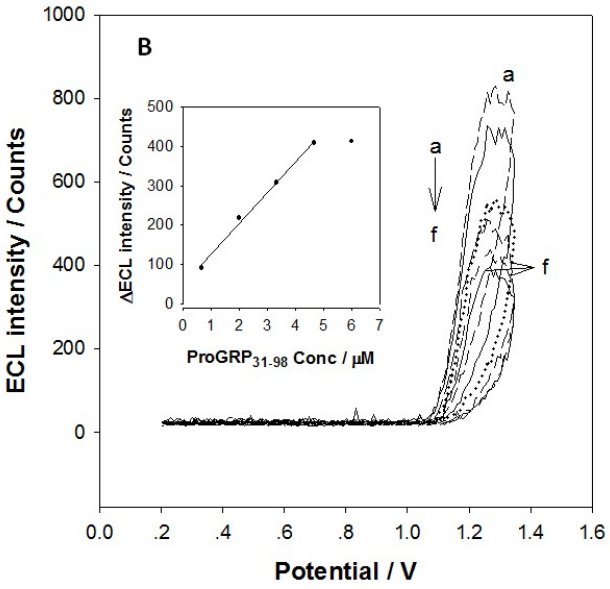


Figure S-4. The ECL intensity—potential curves of the $[Ru(bpy)_2dppz]^{2+}$/aptamer complex at a GC electrode in 5 mM oxalate/oxalic acid solution (pH = 5.5) containing 1 μM aptamer and 20 μM $[Ru(bpy)_2dppz]^{2+}$ for aptamer (A) A18", and (B) A18''' under the titration with $ProGRP_{31-98}$. The PMT was biased at 1200 V. Insets: The plots of the changes of the $[Ru(bpy)_2dppz]^{2+}$/aptamer complex ECL peak values versus the $ProGRP_{31-98}$ concentration.