Supporting Information

Label-Free Telomerase Activity Detection via Electrochemical Impedance Spectroscopy

Diana C. Díaz-Cartagena[a,d], Griselle Hernández-Cancel[b], Dina P. Bracho-Rincón[b,c], José A. González-Feliciano[b], Lisandro Cunci[d], Carlos I. González[b,c], and Carlos R. Cabrera[a,b*]

[a] Department of Chemistry, University of Puerto Rico, Río Piedras Campus, San Juan, PR 00931

[b] Molecular Sciences Research Center, University of Puerto Rico, San Juan, PR 00926

[c] Department of Biology, University of Puerto Rico, Río Piedras Campus, San Juan, PR 00931

[d] School of Natural Sciences and Technology, Universidad Ana G. Méndez, Gurabo Campus, Gurabo, PR 00778-3030

Cyclic Voltammetry

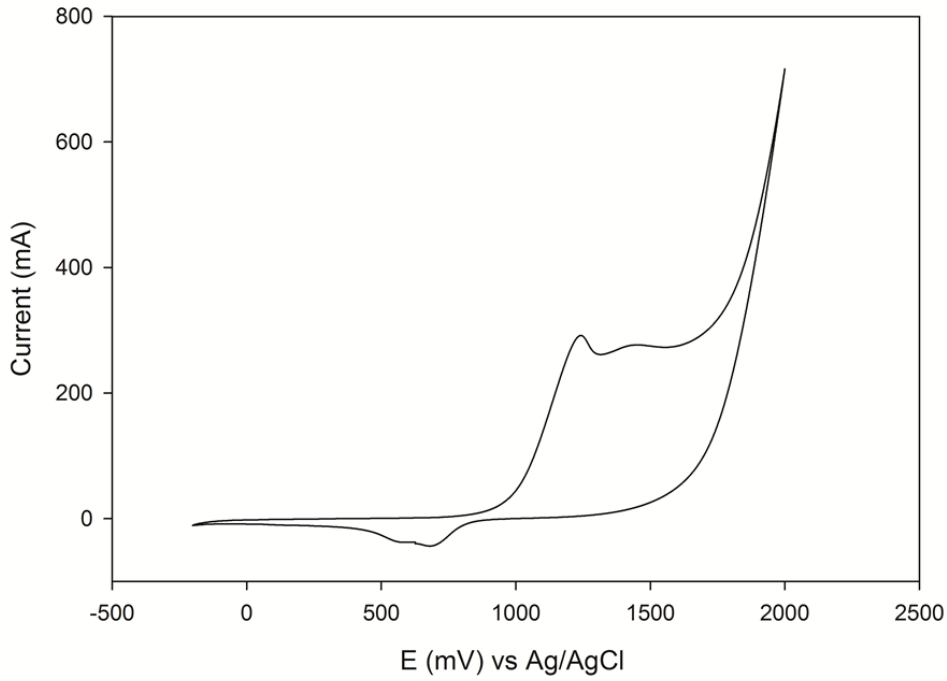

Figure S1. Cyclic Voltammogram for TS modified electrode in nuclear extract, dNTPs and Buffer C solution.

Biosensor Response

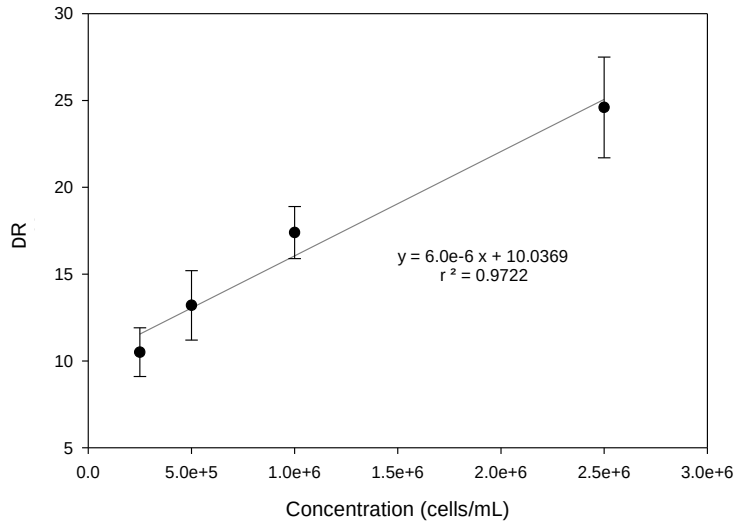

Figure S2. Calibration Curve, ΔR vs. Concentration, for biosensor response at 180 min of enzymatic reaction.

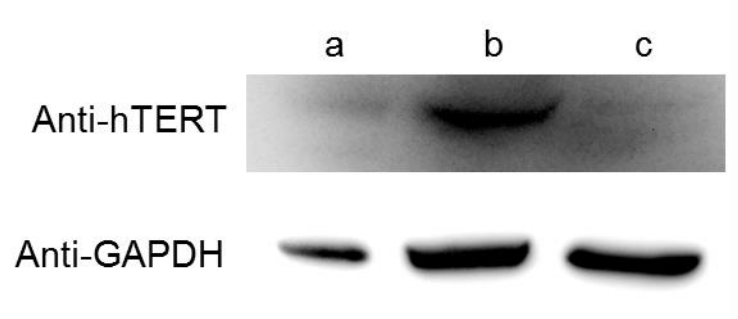

Figure S3. Immunoblotting representation targeting telomerase and GAPDH in **(a)** positive control-Jurkat total extract, **(b)** nuclear extract sample and **(c)** cytoplasm fraction.

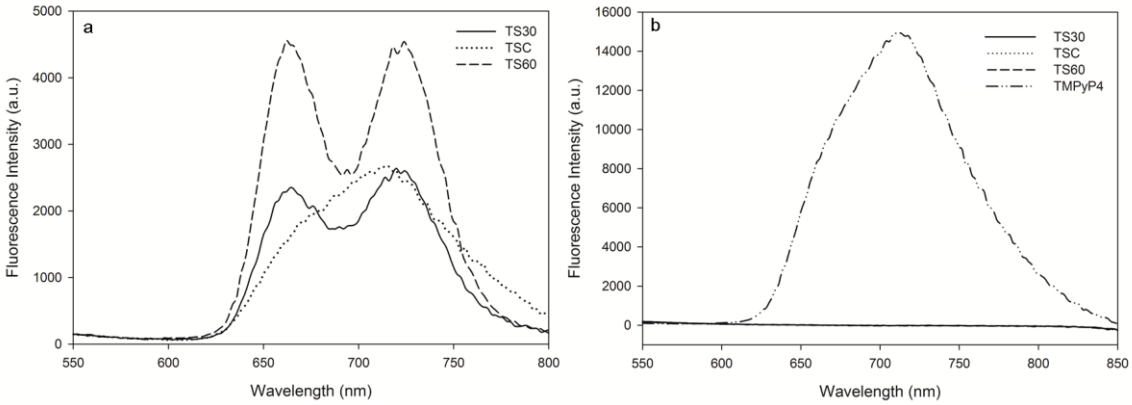

Figure S4. (a) Fluorescence spectra for TS probe of 30 bases **(TS30, solid line)**, TS complementary probe **(TSC, dot line)** and TS probe of 60 bases **(TS60, dash line)** with TMPyP4. **(b)** Fluorescence spectra for; TS probe of 30 bases **(TS30, solid line)**, TS complementary probe **(TSC, dot line)** and TS probe of 60 bases **(TS60, dash line)** without TMPyP4 and TMPyP4 itself (**dash dot line**).

Charge Transfer Resistance for 24h and 2h DNA Au Microchip Electrode Modifications

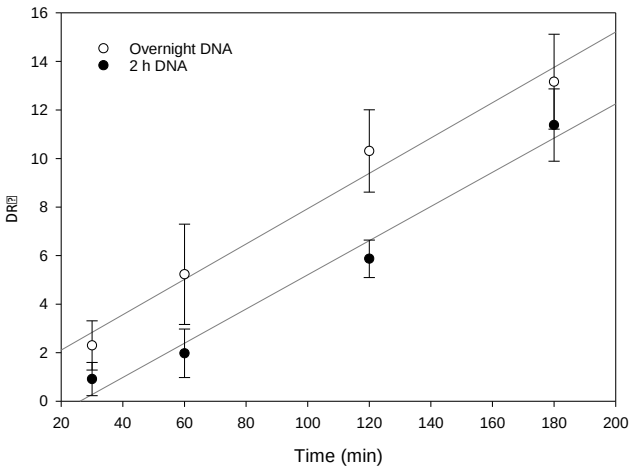

Figure S5. Charge transfer resistance changes (ΔR) as a function of telomerase enzymatic reaction time for electrodes modified with TS-30 for **(•)** 2 hours and **(o) 20** h in 5 x 10^5 cells/mL extract with DNTPs. This figure show more change in ΔR for overnight modification thus this modification was used for further experiments.