Supporting information

Application of Electrochemical Devices to Characterize the Dynamic Actions of Helicases on DNA

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Contents

Table S1: Crystallization data for 6xHis-StoXPB2

Data collection and refinement statistics (molecular replacement)

	Native
Data collection	
Space group	P 43 21 2
Cell dimensions	
a, *b*, *c* (Å)	160.92, 160.92, 122.96
α, β, γ (°)	90.00, 90.00, 90.00
Resolution (Å)	29.9 - 3.05 (3.21 - 3.05)
R_{merge}	37.4 (290.4)
$I / \sigma I$	11.2 (2.0)
CC1/2 (%)	99.6 (62.9)
Completeness (%)	99.9 (100.00)
Redundancy	23.6 (23.4)
Refinement	
Resolution (Å)	30.00 - 3.05
No. reflections	29713
R_{work} / R_{free}	19.60 / 22.58
No. atoms	
Protein	6404
Sulfate Ion	70
Chloride Ion	7
Glycerol	42
Water	134

B-factors	
Protein	99.61
Ligand/ion	97.44
Water	61.54
R.m.s. deviations	
Bond lengths (Å)	0.0098
Bond angles (°)	1.3146
Ramachandran	
Core	86.8%
Allowed	13.2%
Gen. Allowed	0.0%
Outliers	0.0%

*2 crystals were used for data process and structure determination.

*Values in parentheses are for highest-resolution shell.

Figure S1: Images of the custom chip used for study

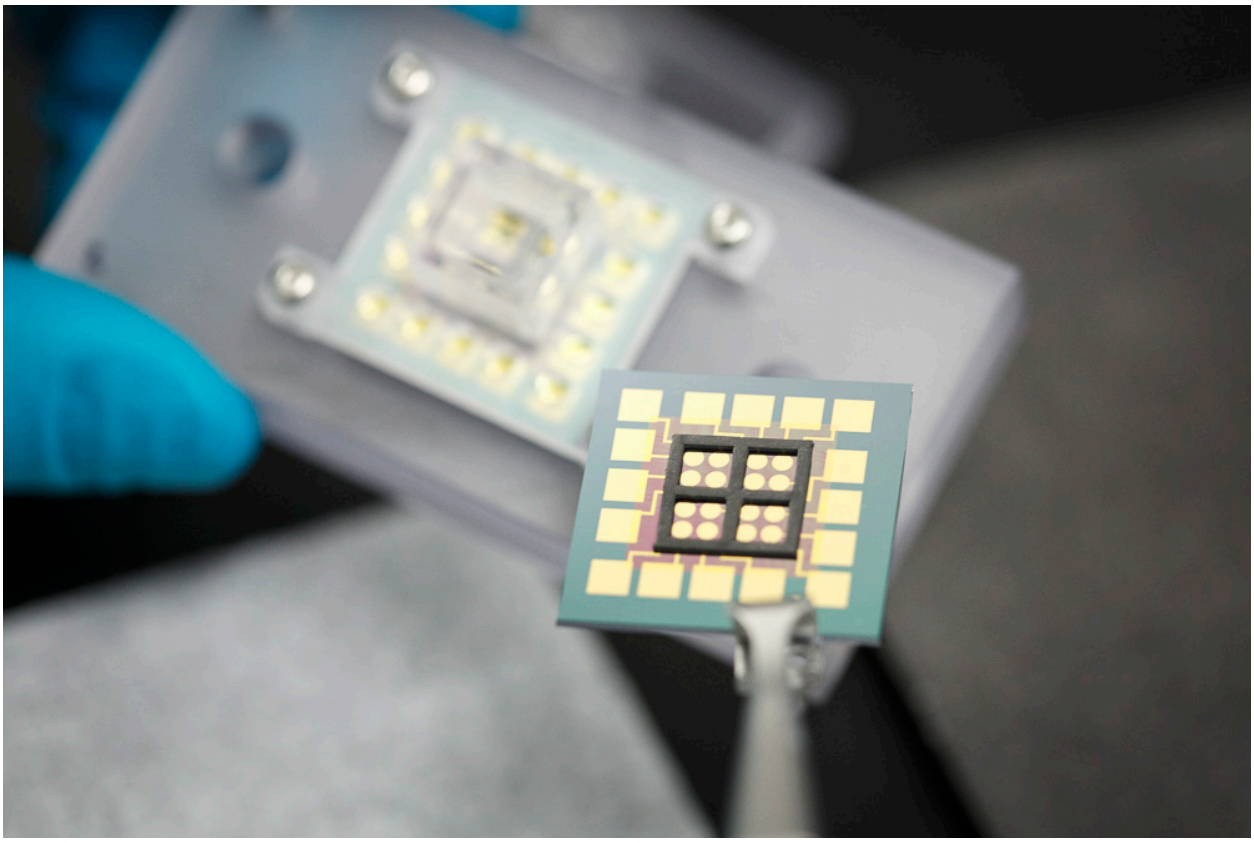

Figure S1: Image of the custom chip used for study.

Figure S2: Images of custom temperature controlled electrochemical setup

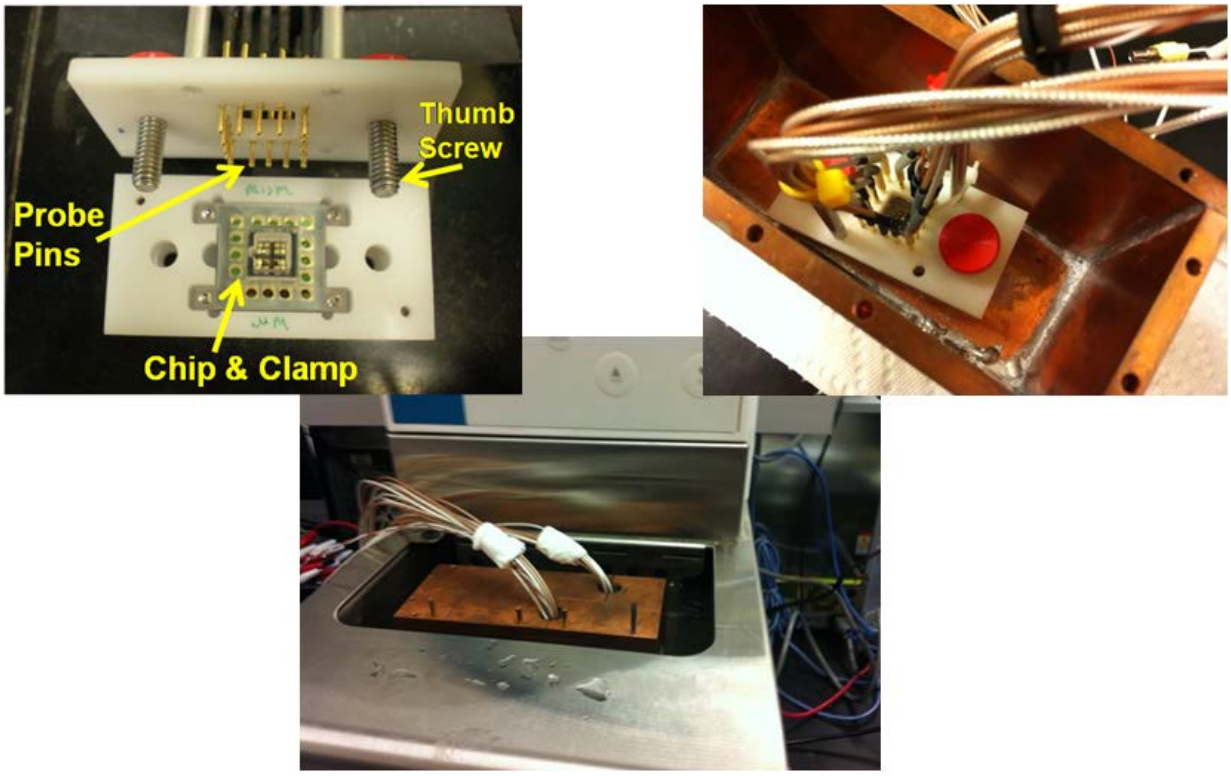

Figure S2. Setup for attaining temperature control of multiplexed electrode chips. (Upper) Illustration of the chip layout for studying self-assembled monolayers of probe-modified DNA on multiplexed gold electrodes. (Middle left) Chips are connected to external electrochemical hardware with a modular test mount that also maintains buffer solution over the chip. (Middle right and lower) The entire mount is then placed in a copper box that is submerged in a temperature-controlled water bath. This ensures temperature uniformity over the entire mount.

Figure S3: Chemical drawings of the C6 linker and Nile Blue redox probe coupling

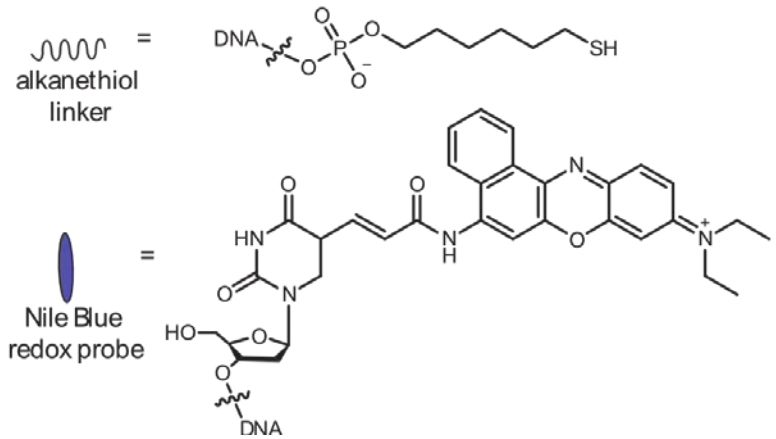

Figure S3. DNA modifiers used in this study. The moiety used for self-assembling DNA to the electrode surface is the C6 Thiol Modifier S-S from Glen Research. The Nile Blue redox probe was attached by coupling the dye, Nile Blue A perchlorate, to the NHS Carboxy DT phosphoramidite from Glen Research.