Electronic Supplementary Material (ESI) for Faraday Discussions.

Supporting Information

Energetics of Base-Flipping at a DNA Mismatch Site Confined at the Latch Constriction of α-Hemolysin

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Effect of temperature on capture and analysis of the CC_9 duplex

Figures S1-S6 are examples shown as an accompaniment to Figure 2 in the main text. Each shows approximately 20 s of recorded data from the same αHL channel but at different temperatures. Labels for I_0 (open channel current), and I_1 and I_2 (current states observed when DNA is inside αHL) have been added as a guide to eye.

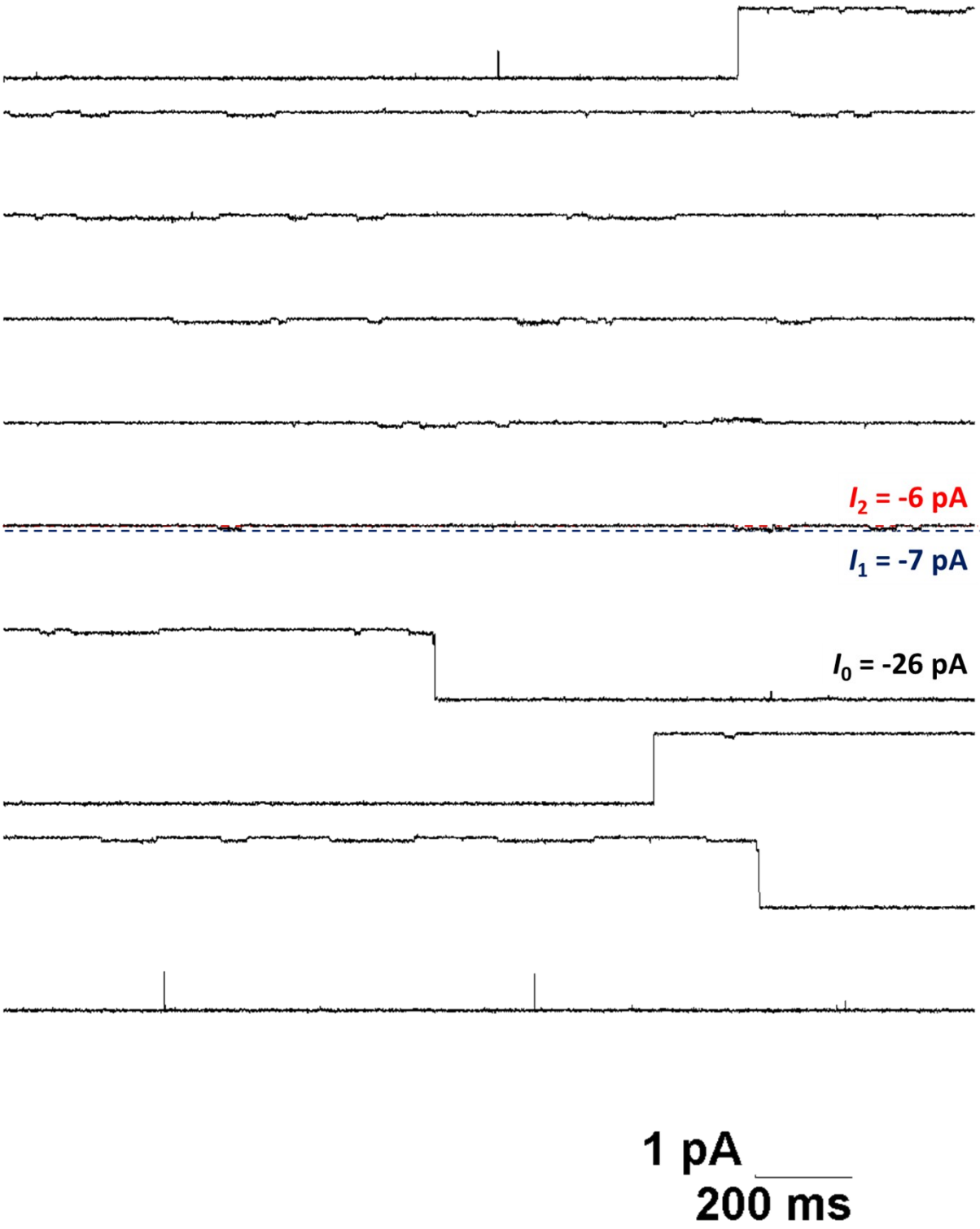

Figure S1. Extended current-time trace demonstrating capture and analysis of the CC_9 duplex at 18 °C. Data were recorded in a 10 mM phosphate buffer (pH 7.5) with 0.25 M KCl. A potential of 120 mV was applied across the αHL channel.

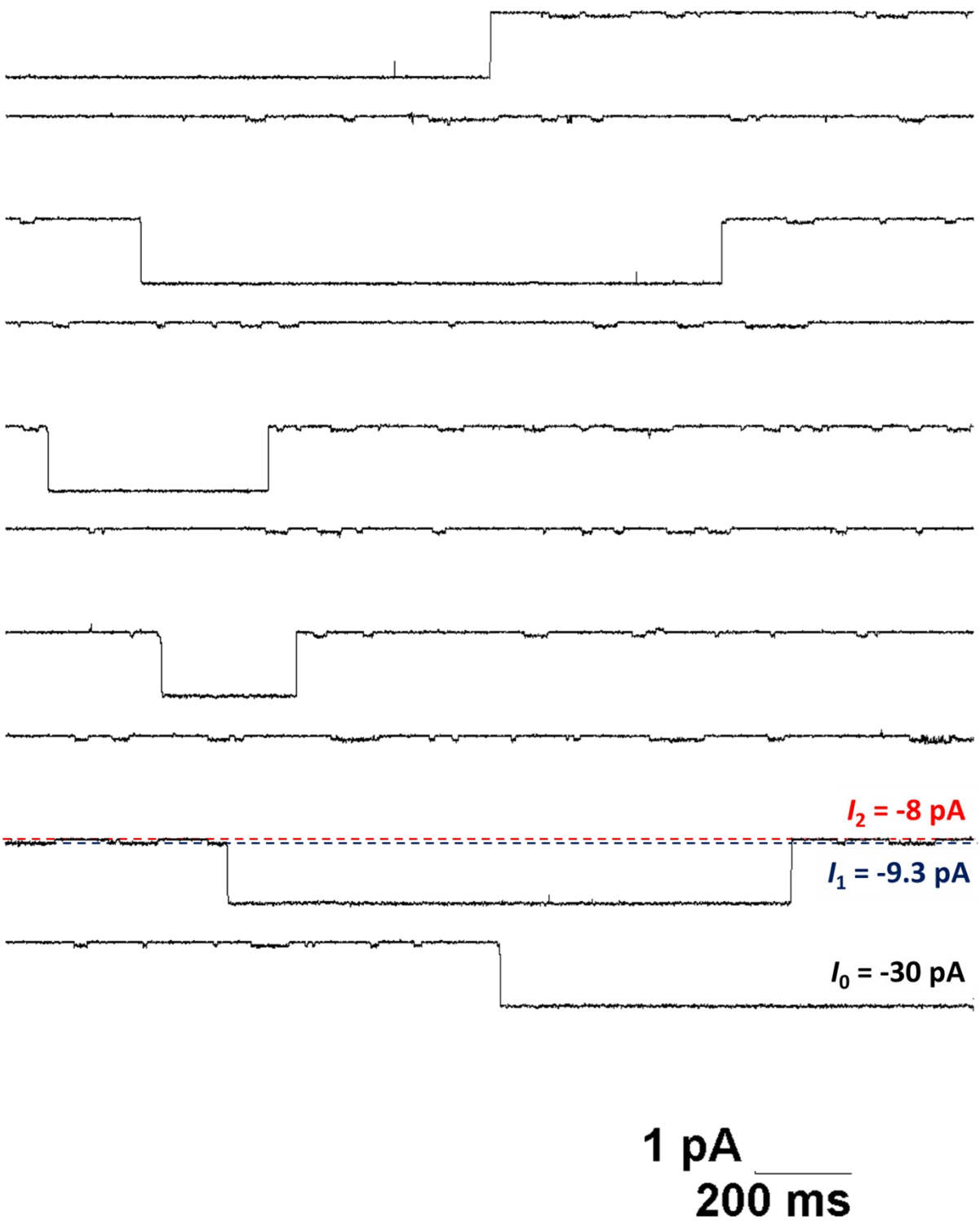

Figure S2. Extended current-time trace demonstrating capture and analysis of the CC_9 duplex at 20 °C. Data were recorded in a 10 mM phosphate buffer (pH 7.5) with 0.25 M KCl. A potential of 120 mV was applied across the αHL channel.

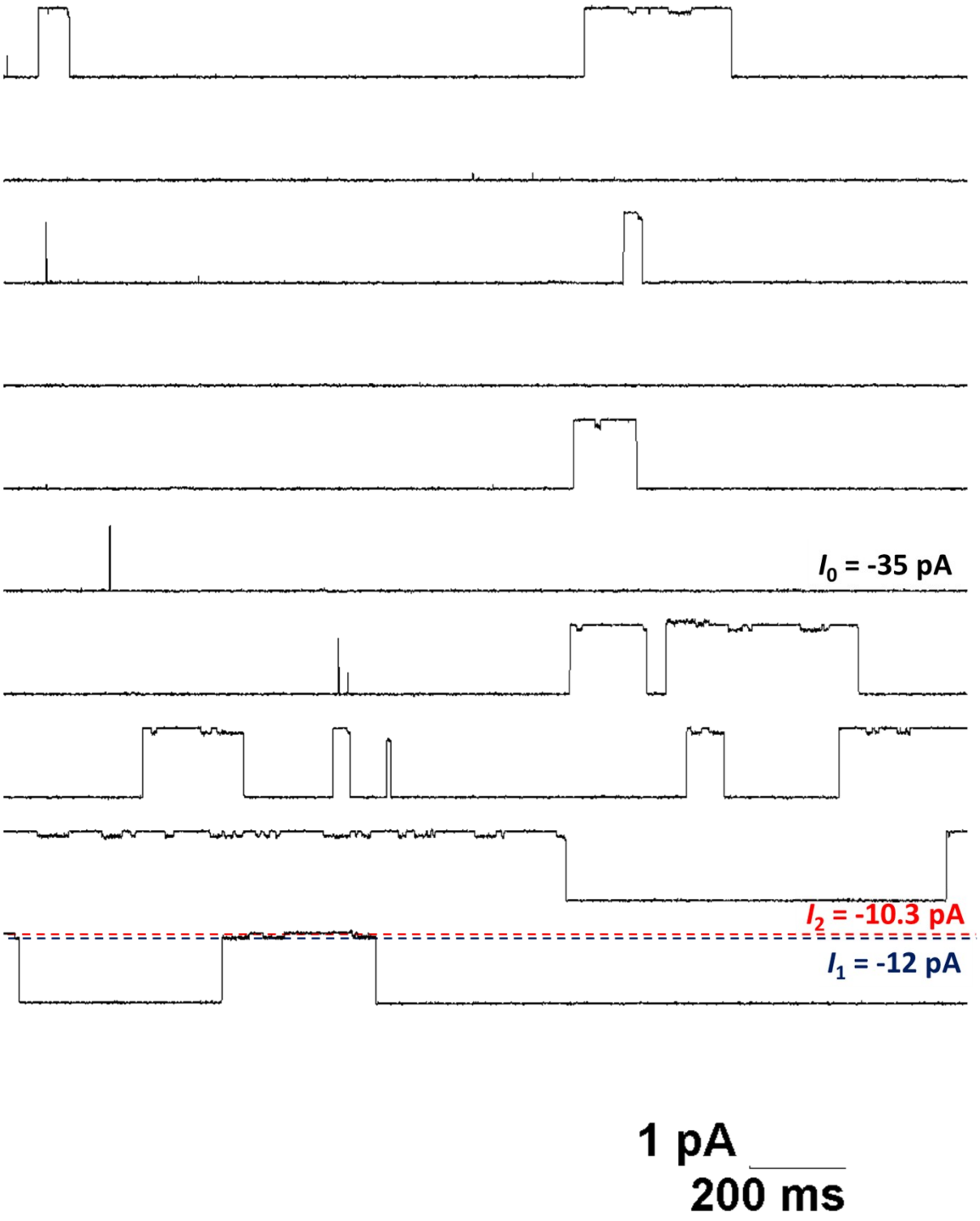

Figure S3. Extended current-time trace demonstrating capture and analysis of the CC_9 duplex at 25 °C. Data were recorded in a 10 mM phosphate buffer (pH 7.5) with 0.25 M KCl. A potential of 120 mV was applied across the αHL channel.

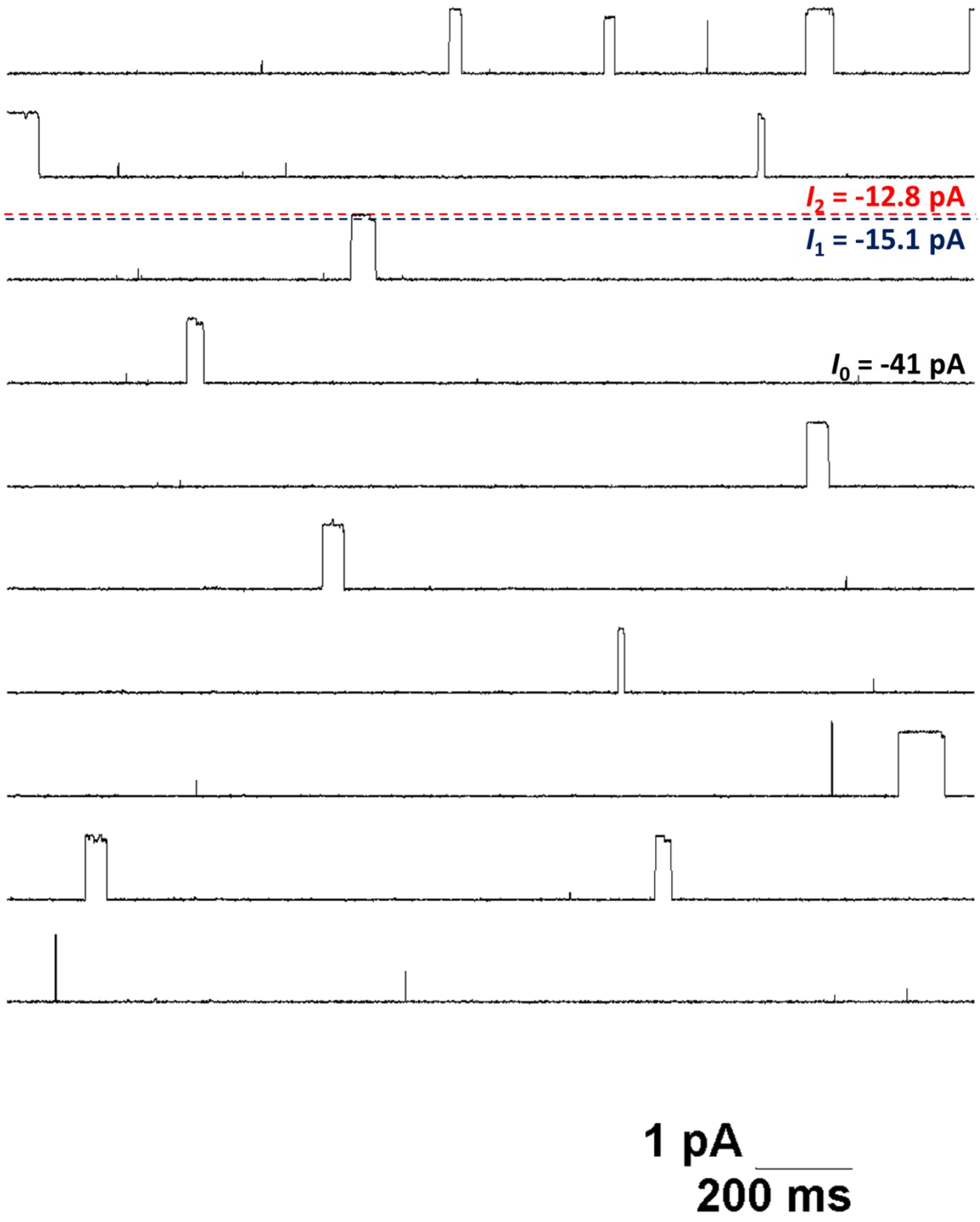

Figure S4. Extended current-time trace demonstrating capture and analysis of the CC_9 duplex at 30 °C. Data were recorded in a 10 mM phosphate buffer (pH 7.5) with 0.25 M KCl. A potential of 120 mV was applied across the αHL channel.

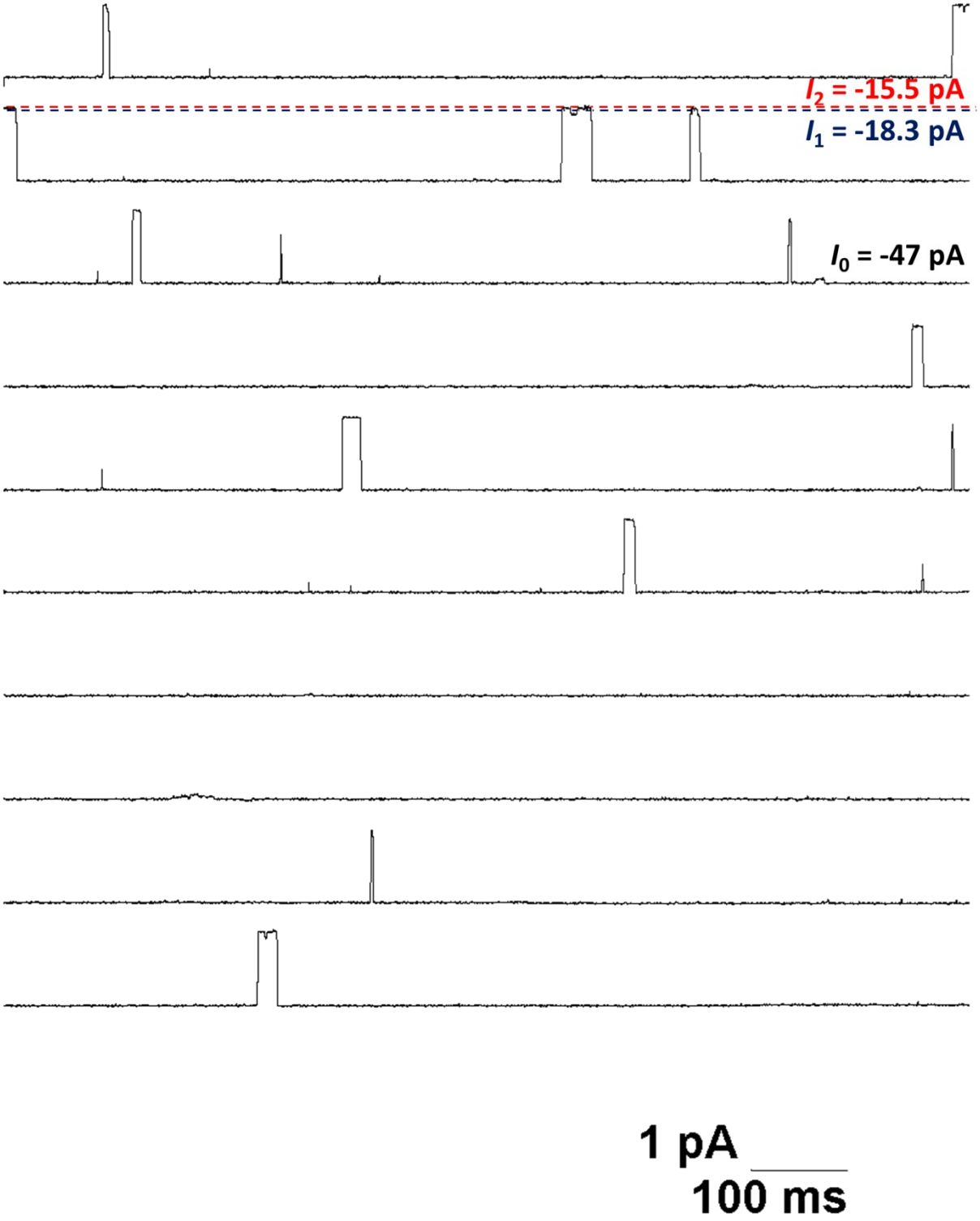

Figure S5. Extended current-time trace demonstrating capture and analysis of the CC_9 duplex at 35 °C. Data were recorded in a 10 mM phosphate buffer (pH 7.5) with 0.25 M KCl. A potential of 120 mV was applied across the αHL channel.

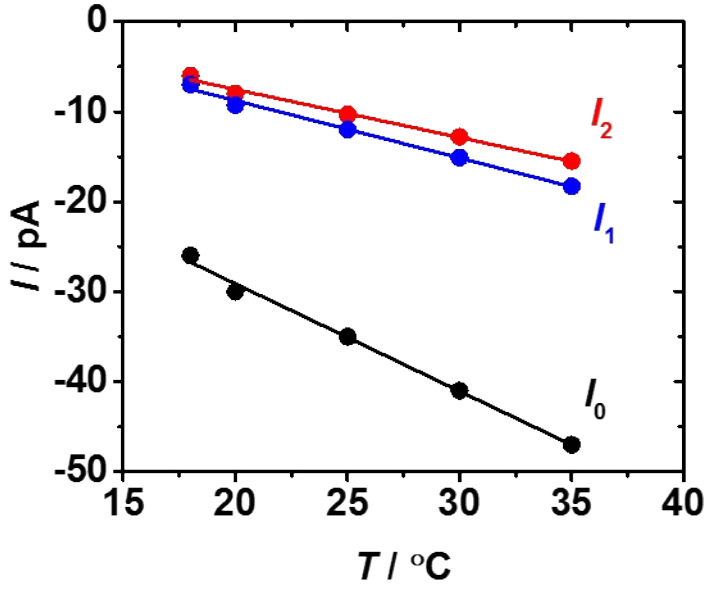

Figure S6. The residual current of states I_1, I_2, and I_0 increase approximatley linearly with temeprature. Data are shown for measurments from a single αHL protien channel, recorded at different temperatures (Figures S1-S5). States I_1 and I_2 corresponds to the flipped-in and flipped-out states, respectivley. I_0 corresponds to the open channel current. Data were recorded in a 10 mM phosphate buffer (pH 7.5) with 0.25 M KCl. A potential of 120 mV was applied across the αHL channel.

State lifetime histograms as a function of temperature

Figure S7 shows the kinetic data from which the lifetime constants for states I_1 and I_2 were derived at each temperature, as an accompaniment to Figure 3 from the main text. Data for T = 18 °C and 35 °C are shown in Figure 3.

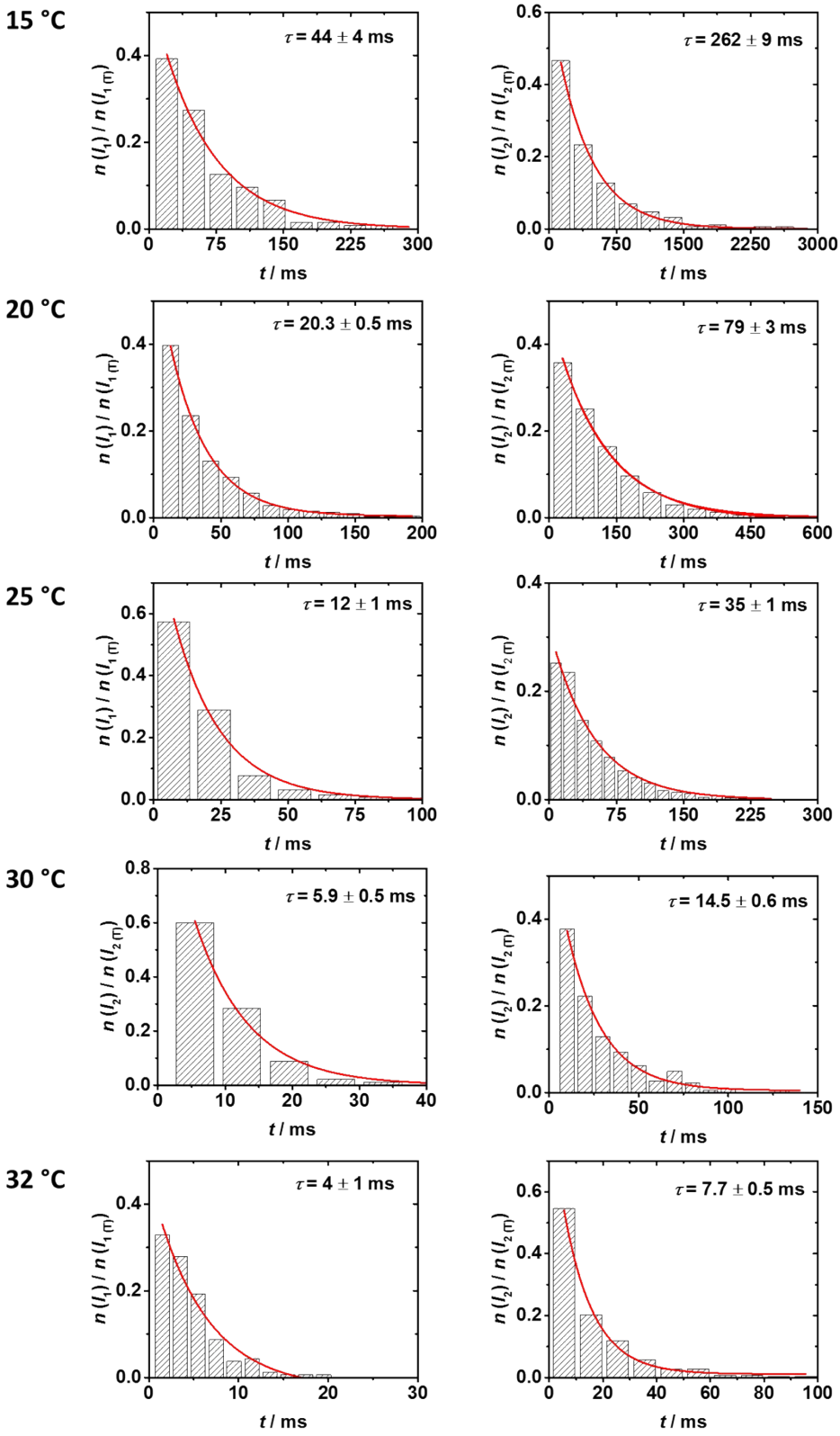

Figure S7. Lifetime histrograms of the states I_1 and I_2 as a function of temperature. Data at 18 °C and 35 °C are shown in Figure 2 (main text).