

## Supplementary Information

# Investigation of compacted DNA structures induced by Na<sup>+</sup> and K<sup>+</sup> monovalent cations using biological nanopore

Trang Vu, Shanna-Leigh Davidson, Jiwook Shim\*

Department of Biomedical Engineering, Rowan University, Glassboro, New Jersey 08028, USA.

\*Corresponding Author:

Jiwook Shim, Ph.D.

Department of Biomedical Engineering  
Henry M. Rowan College of Engineering

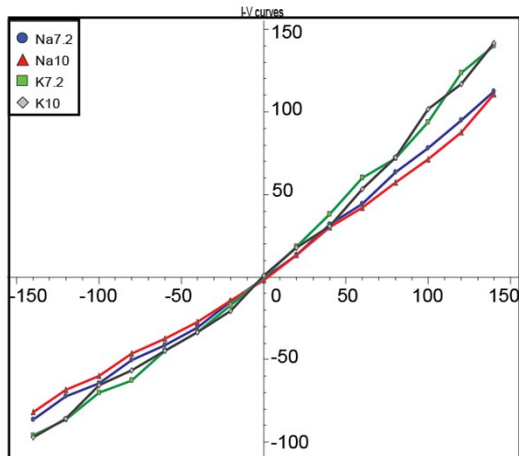
Rowan University

201 Mullica Hill Road

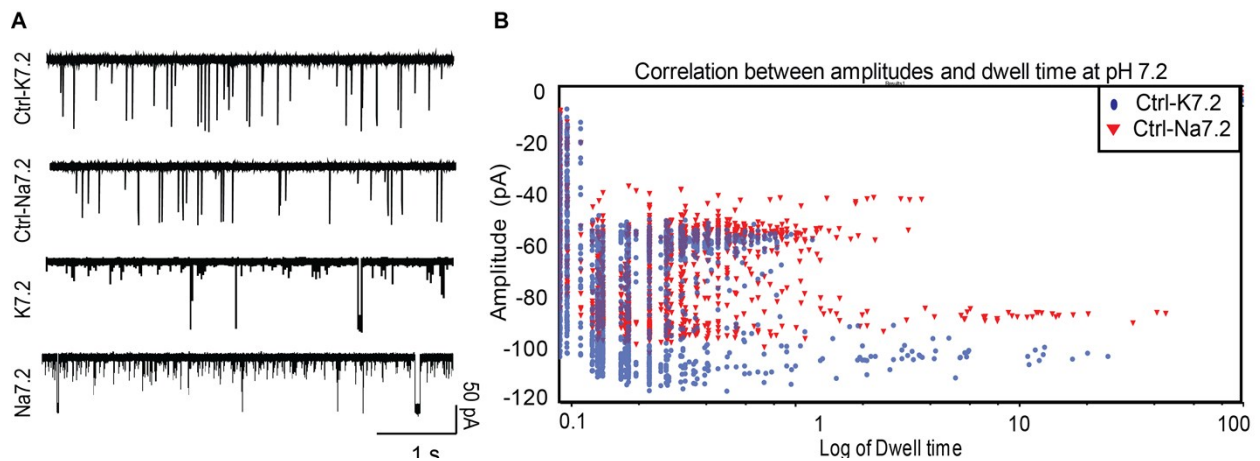
Glassboro, NJ 08028

Email: [shimj@rowan.edu](mailto:shimj@rowan.edu)

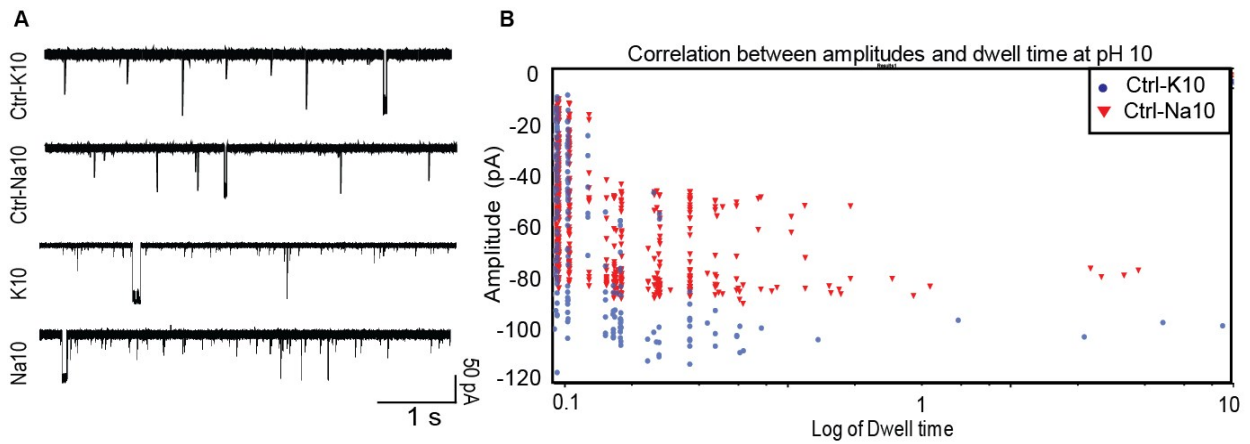
Phone: (856) 256-5393



**Supplementary Information figure S1.** IV curves of the experimental conditions, containing 1M of either KCl or NaCl, at 7.2 and 10 pH. All I-V curves fit the characteristic I-V plot of an  $\alpha$ -hemolysin nanopore.



**Supplementary Information figure S2.** Negative control experiment at pH 7.2. (A) Event data traces of Control K7.2, Control Na7.2, K7.2, and Na7.2. The control sample is an 18 bases ssDNA containing all four nucleotide base types (A, T, C, G). The absence of shallow blockage event ( $\%I/I_0 < 30$ ) indicates the control sample's inability to form compacted structures. (B) Scatter plot represents the correlation between event blockage amplitude and dwell time of the Ctrl-K7.2 and Ctrl-Na7.2. The two event clusters indicate the presence of hairpin structure ( $\%I/I_0 \sim 50\%$ ) and the translocation of a linear ssDNA ( $\%I/I_0 \sim 90\%$ ). All events were collected at 120 mV.



**Supplementary Information figure S3.** Negative control experiment at pH 10. (A) Event data traces of Control-K10, Control-Na10, K10, and Na10. The control sample is an 18 bases ssDNA containing all four nucleotide base types (A, T, C, G). The absence of shallow blockage event ( $\%I/I_0 < 30$ ) indicates the control sample's inability to form compacted structures. (B) Scatter plot represents the correlation between event blockage amplitude and dwell time of the Ctrl-K10 and Ctrl-Na10. The two event clusters indicate the presence of hairpin structure ( $\%I/I_0 \sim 50\%$ ) and the translocation of a linear ssDNA ( $\%I/I_0 \sim 90\%$ ). All events were collected at 120 mV.