

Supporting information for:

Synthetically-encoded ultrashort-channel nanowire transistors for fast, point-like cellular signal detection

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This file includes:

Supplementary Figures S1 and S2

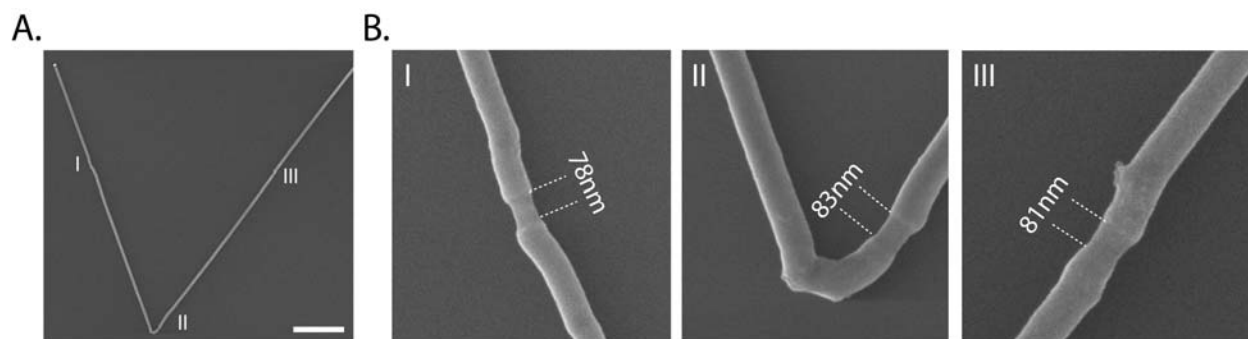


Figure S1. Multiple short channel NWs synthesized on a single Si NW. A. SEM image of a representative 80 nm Si NW with three 80 nm channel length devices. Scale bar is 1.5 μm. B. An expanded view of the short channel segments marked as I, II and III. Synthesized SiNWs were dispersed from isopropanol solutions onto the nitride surface of Si/SiO₂/Si₃N₄ substrates (NOVA Electronic Materials Inc.), then KOH selective etching was used to highlight the transition between n⁺⁺ to intrinsic sections. 10gr of KOH (Sigma-Aldrich Inc.) were dissolved in 88mL DI H₂O and 37mL isopropanol. Substrates with dispersed NWs were dipped in the solution for 3-8sec at 50°C-60°C. The substrates were rinsed with DI H₂O, followed with isopropanol rinse and dried in a N₂ stream.

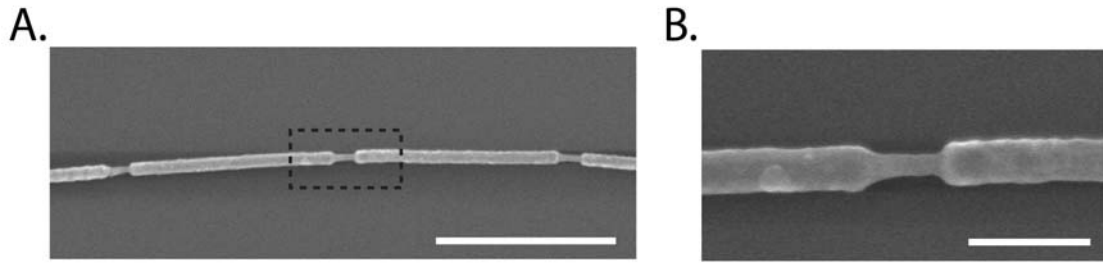


Figure S2. Short channel Si NW FETs designed for recording on multiple length scales. A. SEM image of an 80 nm diameter NW encoded with 130 nm channel lengths that are separated by 1.1 μm ; scale bar is 1 μm . B. An expanded view of the segment marked with a black dashed box; scale bar is 200 nm. Synthesized SiNWs were dispersed from isopropanol solutions onto the nitride surface of Si/SiO₂/Si₃N₄ substrates (NOVA Electronic Materials Inc.), then KOH selective etching was used to highlight the transition between n^{++} to intrinsic sections. 10gr of KOH (Sigma-Aldrich Inc.) were dissolved in 88mL DI H₂O and 37mL isopropanol. Substrates with dispersed NWs were dipped in the solution for 3-8sec at 50°C-60°C. The substrates were rinsed with DI H₂O, followed with isopropanol rinse and dried in a N₂ stream.