Electronic Supplementary Information (ESI) for Nanoscale.

Rapid fabrication of solid-state nanopore with high reproducibility using helium ion microscope over a large area

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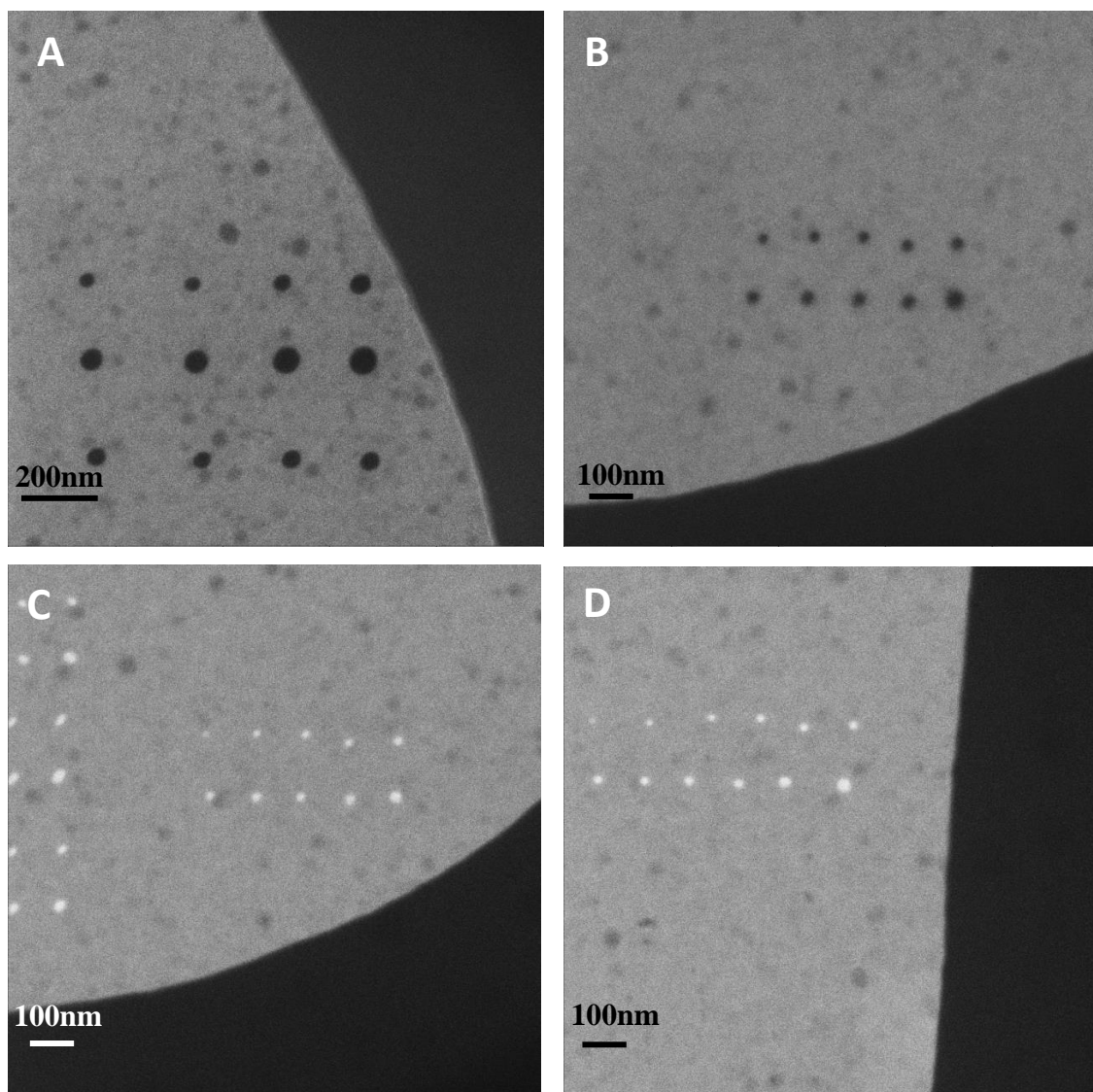Providence, RI 02912 USA

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Figure S1. HIM images to test the nanopore exposure time series: (A)-(B) dirty samples; (C)-(D) clean samples after oxygen plasma cleaning.
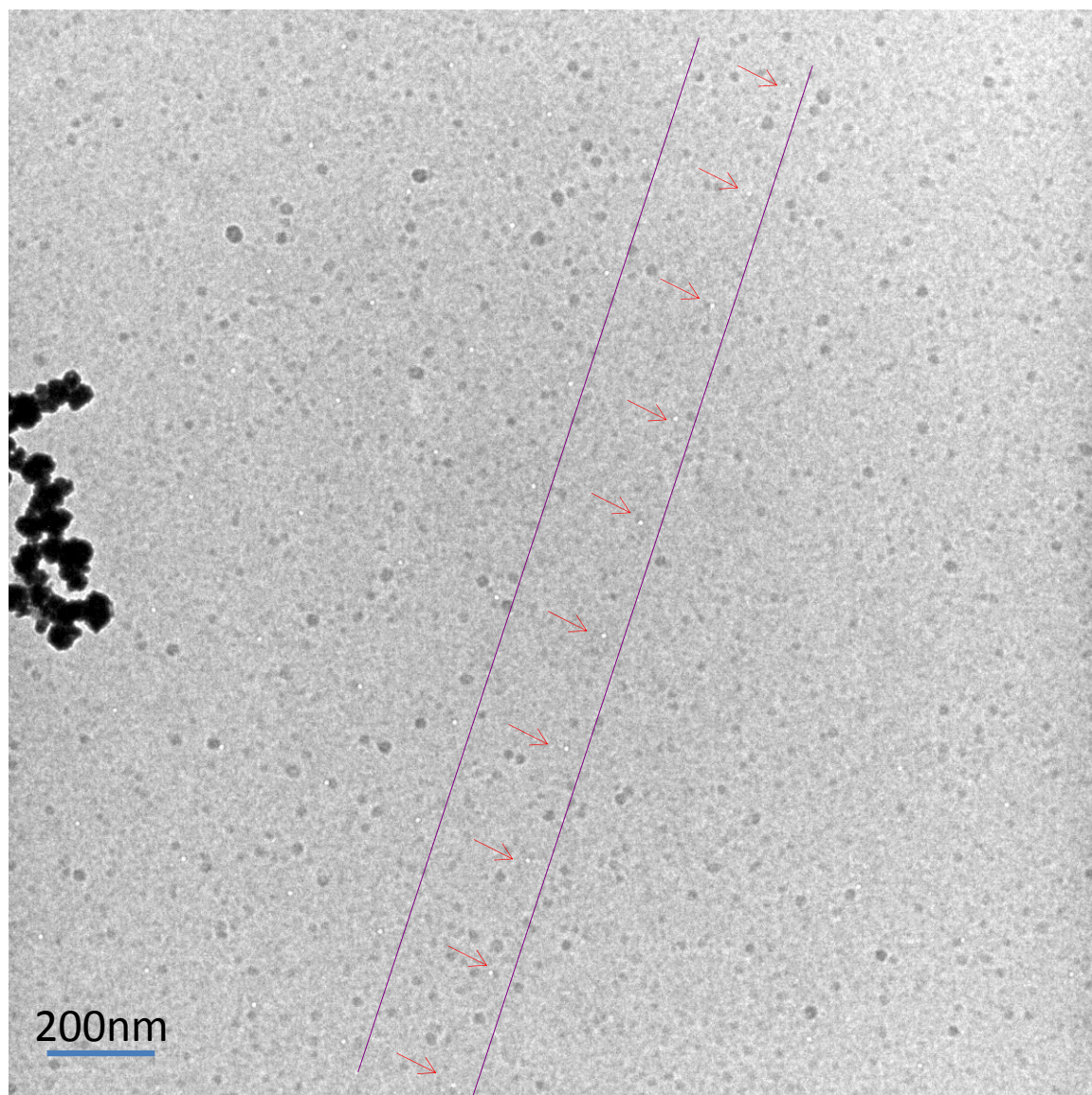
Figure S2. TEM images of overall view of 10×5 array: purple lines meaning x-direction and red arrows meaning nanopore locations.
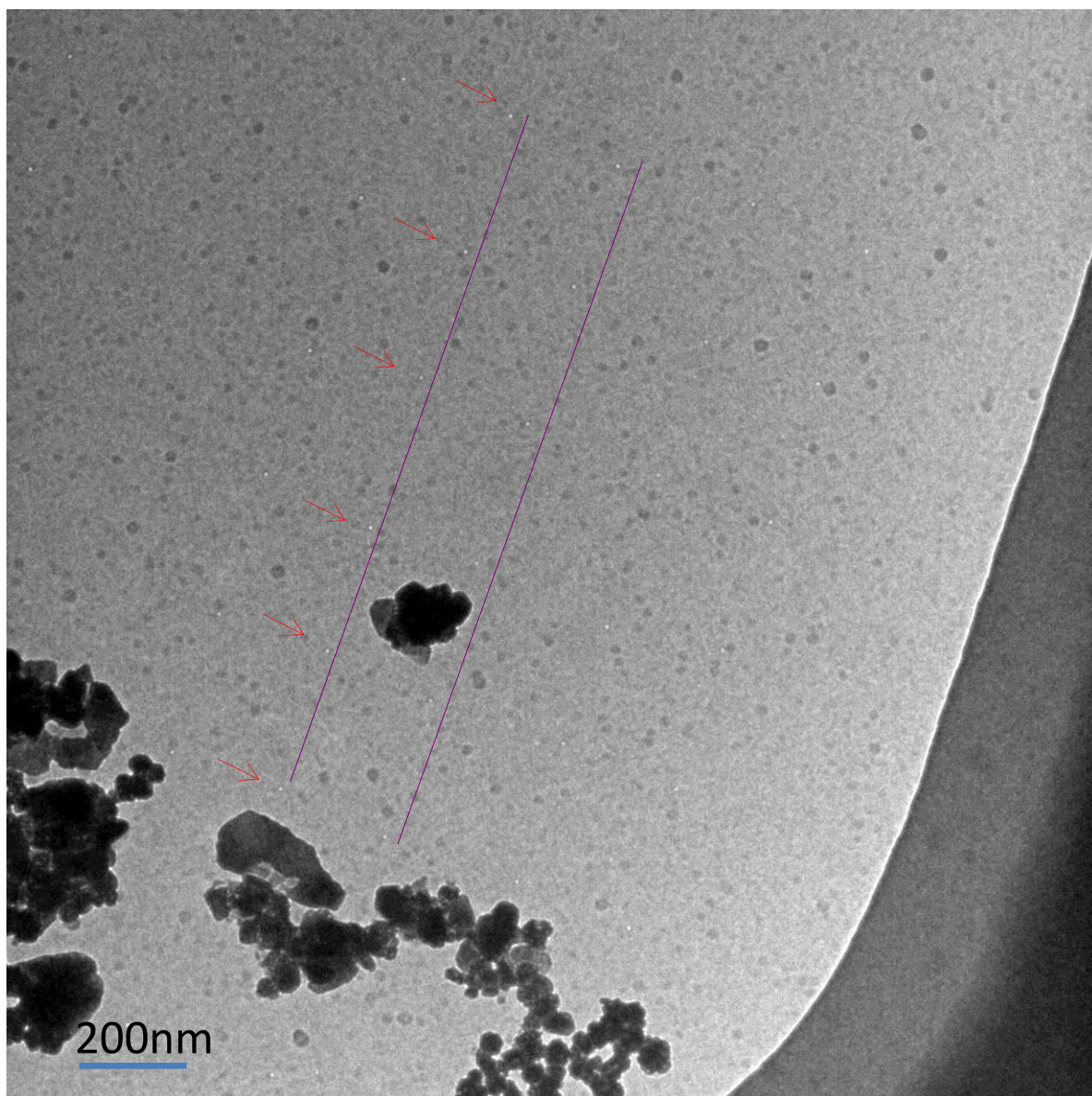
Figure S3. TEM images of overall view of 6×5 array: purple lines meaning x-direction and red arrows meaning nanopore location.
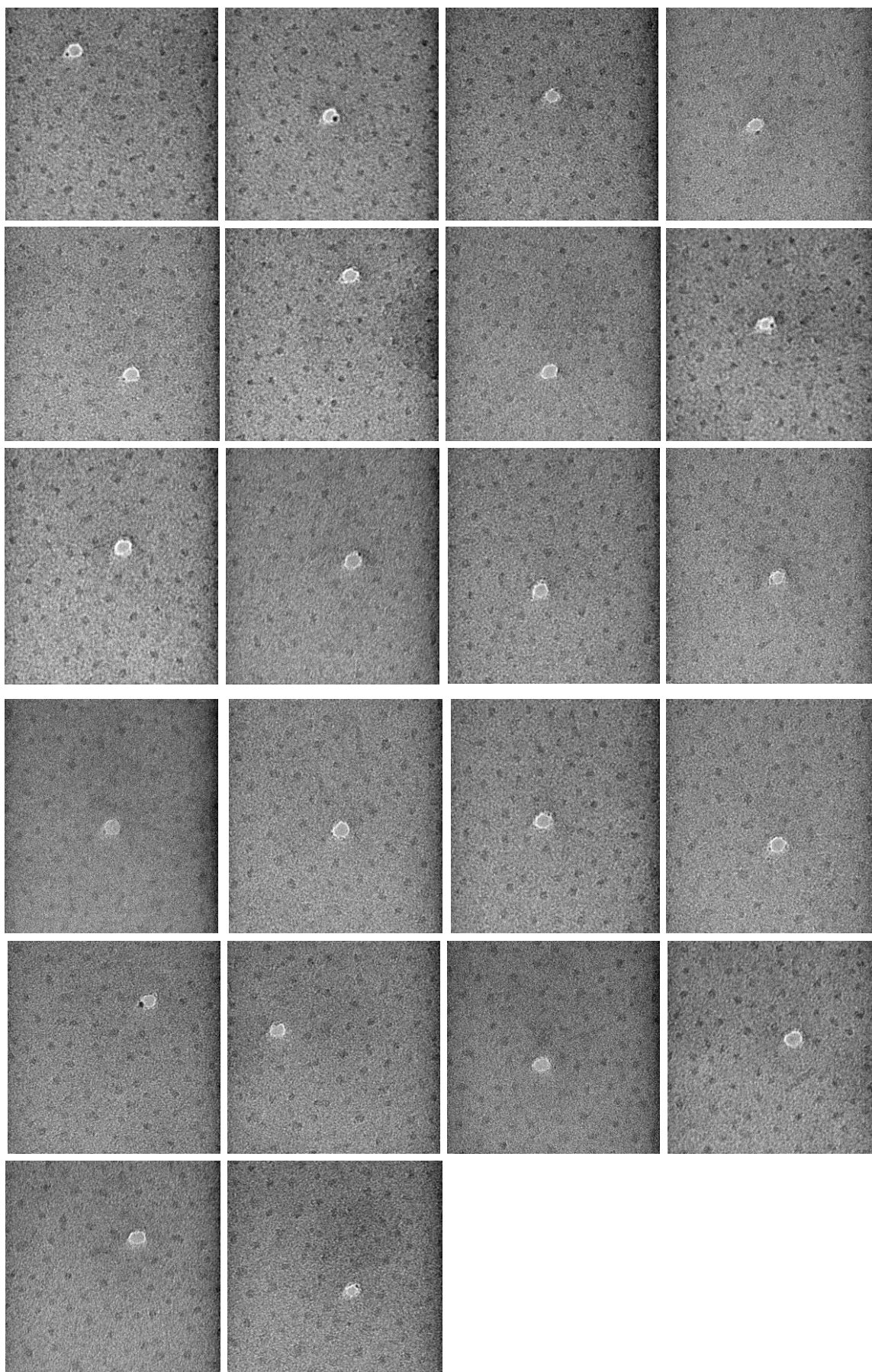
Figure S4. TEM images of 22 individual nanopores in 6×5 arrays with exposure time 0.3s. The field of view of image is 90nm.

Table S1. Nanopore dimensions (long axis × short axis, nm) from TEM images for exposure time 0.3s

1	2	3	4	5	6	7	8	9	10	11
5.4×5.0	5.9×4.7	5.0×4.9	5.9×4.7	6.5×5.9	5.7×5.4	7.0×5.7	7.1×6.3	7.1×5.0	6.7×5.9	6.2×5.8
12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
6.7×5.0	6.1×5.8	6.1×5.3	6.0×5.5	6.0×5.5	7.0×5.8	6.2×6.2	6.2×6.1	7.0×5.5	6.6×5.4	6.2×5.2

Table S2. Nanopore dimensions (long axis × short axis, nm) from TEM images for exposure time 0.5s.

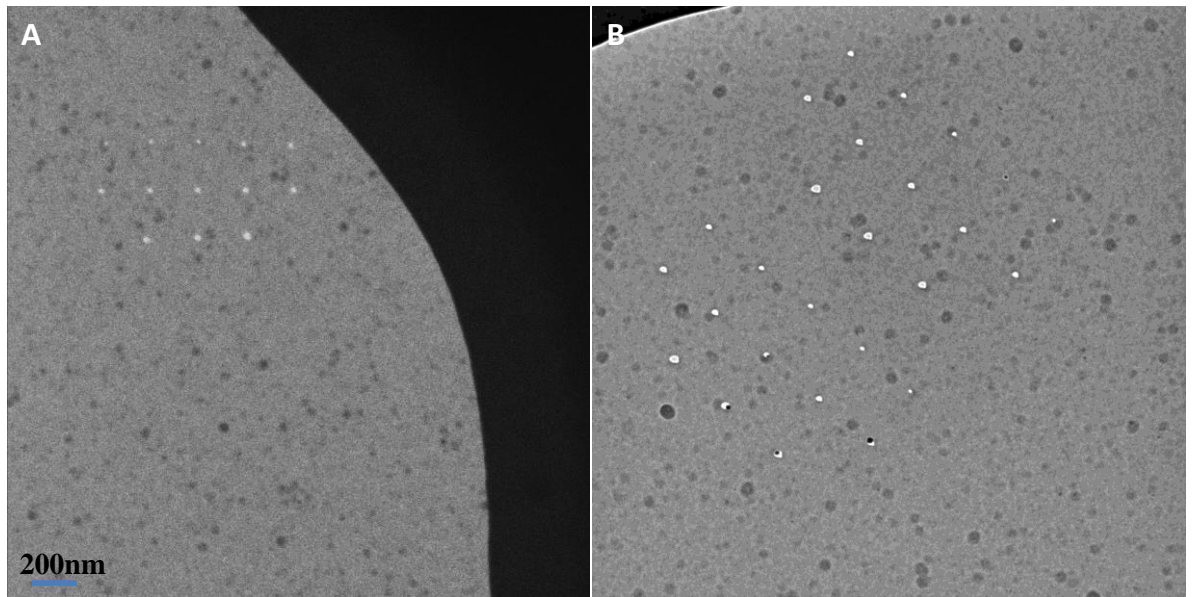| 1	2	3	4	5	6	7	8	9	10
7.8×6.7	8.9×6.7	8.8×6.7	8.0×6.4	8.3×6.6	9.5×6.9	8.8×7.2	7.8×7.0	8.0×6.5	9.3×7.0
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
9.5×8.2	9.5×7.2	8.7×7.2	8.5×8.0	8.3×7.7	9.7×6.5	9.6×7.0	9.1×6.5	8.0×7.0	8.4×7.8
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
9.2×7.7	9.7×8.4	8.4×8.1	8.2×7.8	7.9×7.5	7.6×7.2	10.3×7.2	10.5×6.8	9.6×7.1	10.0×6.7

Figure S5. Images for nanopore arrays with exposure time series (A) quick HIM images after 1st milling of the array ; (B) TEM images for two arrays.
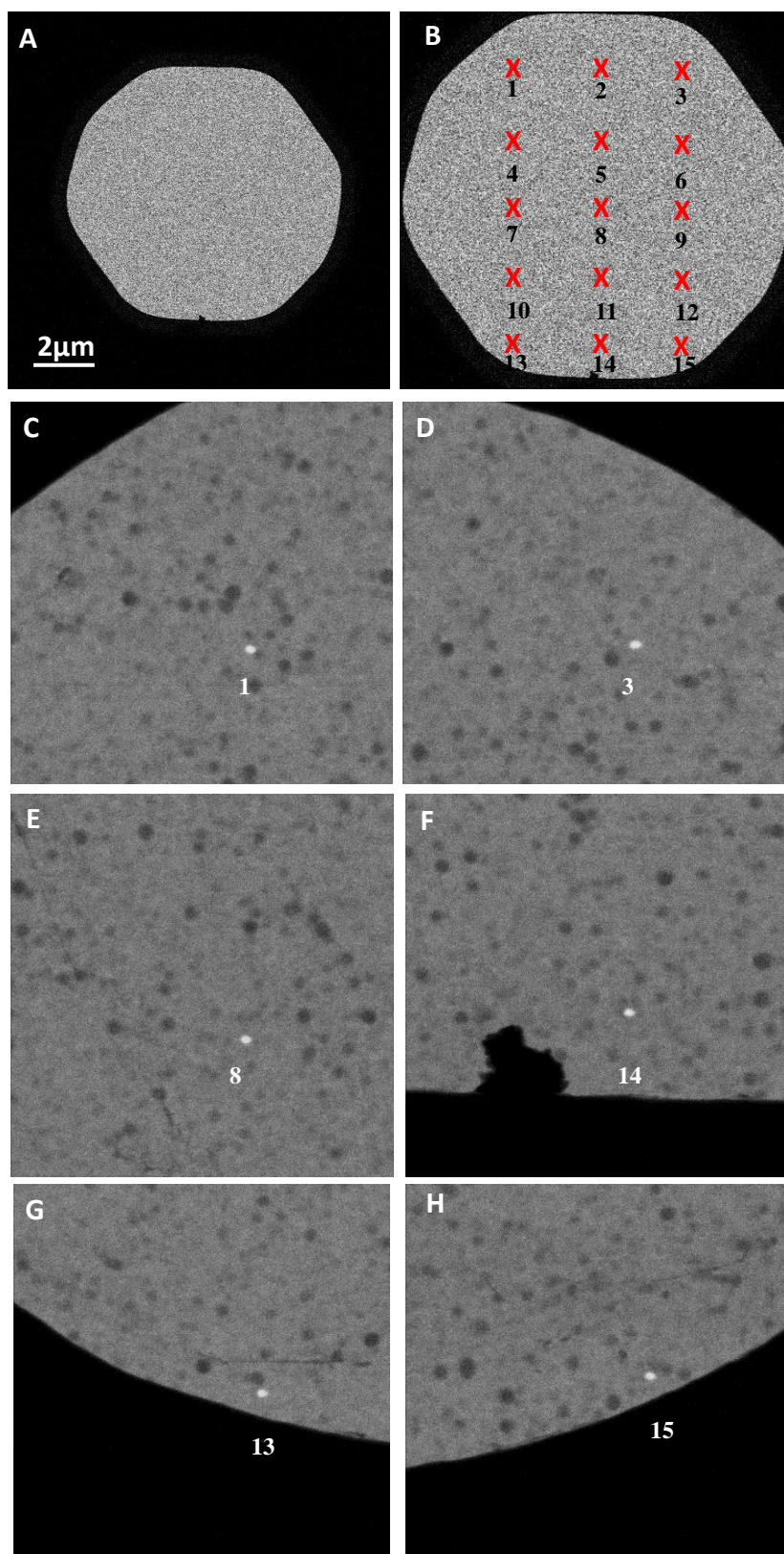
Figure S6. HIM images for 3×5 arrays with automated milling and imaging mode using exposure time 10s: (A) overall disc view; (B) positions of 3×5 arrays; (C) nanopore on position #1; (D) nanopore on position #3; (E) nanopore on position #8; (F) nanopore on position #14; (G) nanopore on position #13; (H) nanopore on position #15. The field of view for (C)-(H) is 2μm.