

Supplementary Information

Of

PNA-based graphene oxide/porous silicon hybrid biosensor: towards a label-free optical assay for Brugada Syndrome

Rosalba Moretta¹, Monica Terracciano ^{2*}, Nicola Borbone², Giorgia Oliviero³, Chiara Schiattarella⁴, Gennaro Piccialli², Andrea Patrizia Falanga³, Maria Marzano⁵, Principia Dardano¹, Luca De Stefano^{1*}, Ilaria Rea¹

¹Institute of Applied Sciences and Intelligent Systems, National Research Council, Naples, Italy

²Department of Pharmacy, University of Naples Federico II, Italy

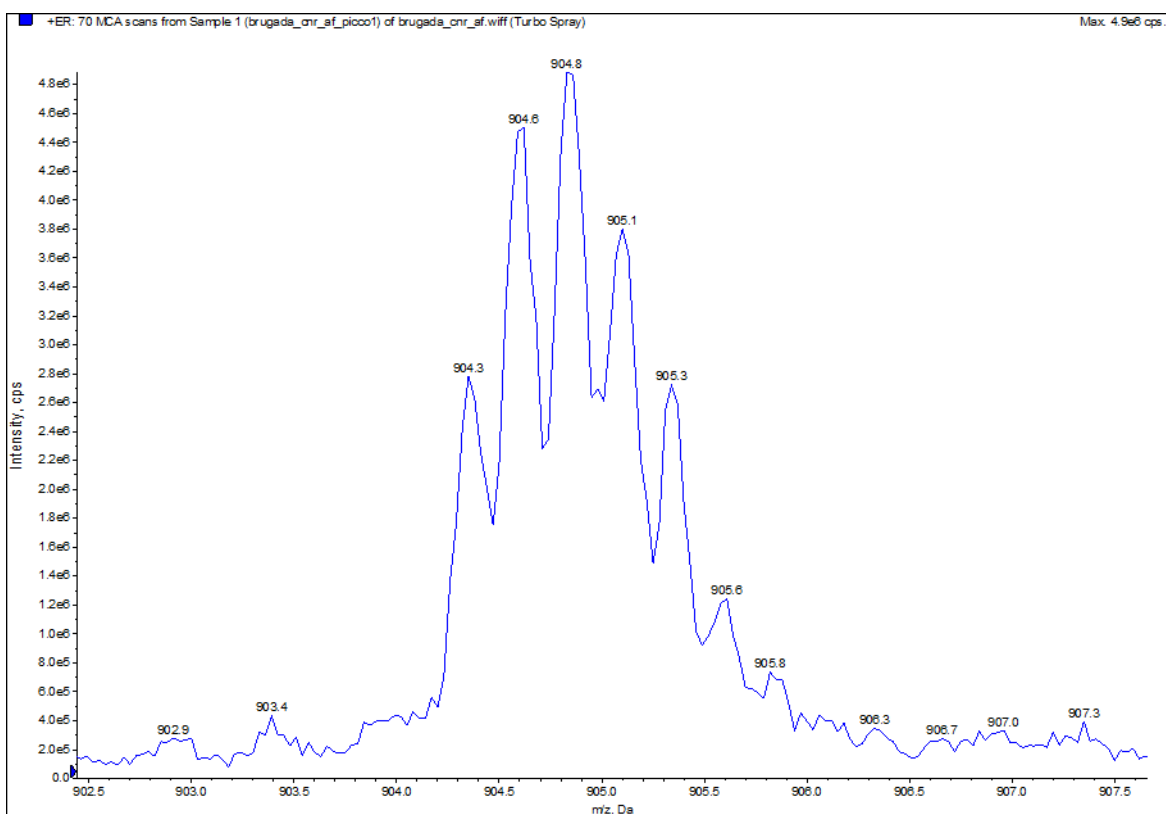
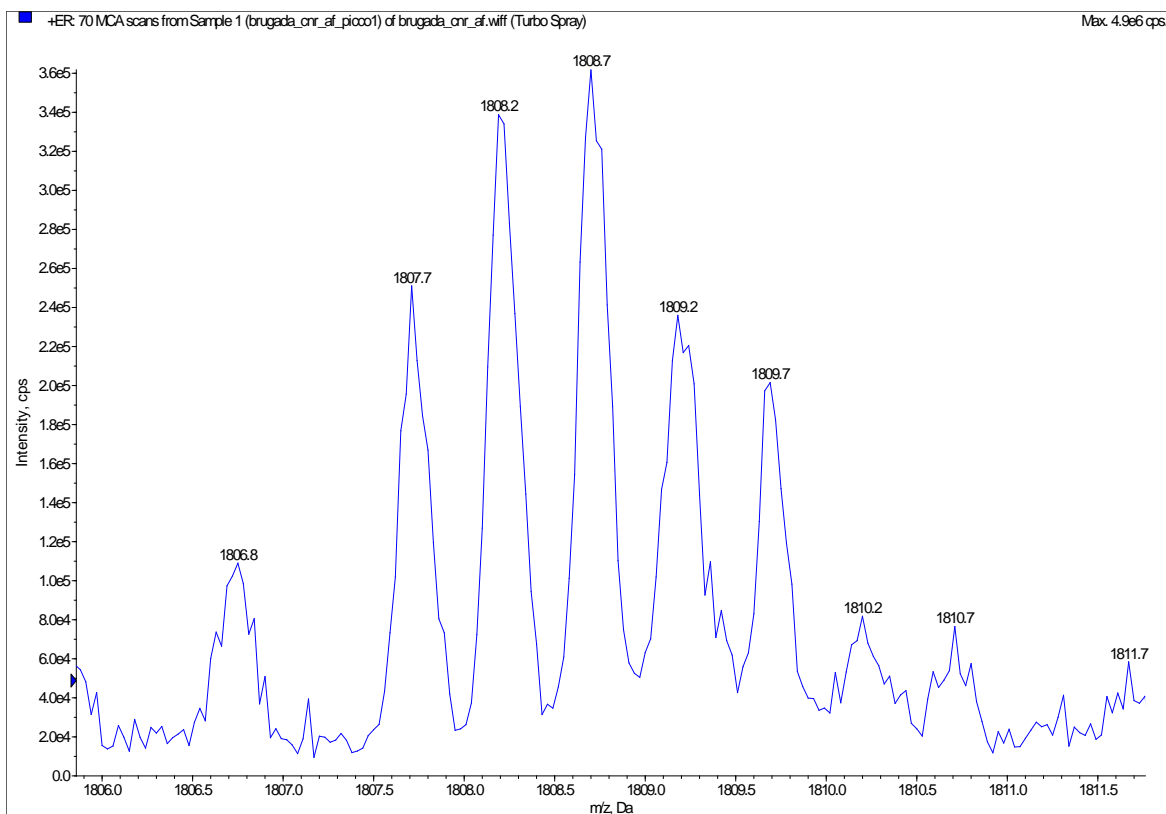
³Department of Molecular Medicine and Medical Biotechnologies, University of Naples Federico II, Naples, Italy

⁴Department of Physics "E. Pancini", University of Naples Federico II, Naples, Italy

⁵Institute of Crystallography, National Research Council, Bari, Italy

*Correspondence: (M.T.) monica.terracciano@unina.it, Tel.: +39-081-678521;

(LDS) luca.destefano@na.isasi.cnr.it, Tel.: +39-081-6132594



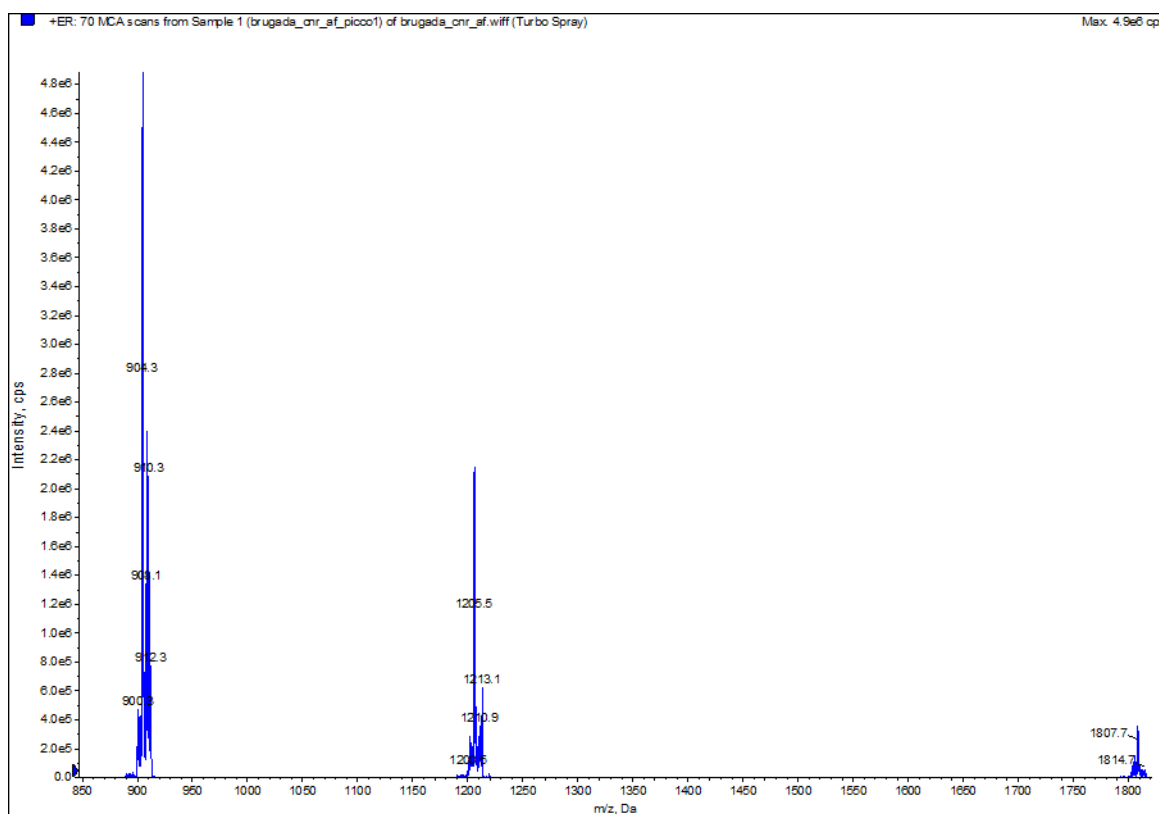


Figure S1: Expansions of the MCA ESI-MS spectrum of PNA recorded in the positive ion mode. Calcd. for $[M + 2H]^{2+}$ 1807.74, found 1807.7, calcd. for $[M + 3H]^{3+}$ 1205.49, found 1205.5; calcd. for $[M + 4H]^{4+}$ 904.37, found 904.4.

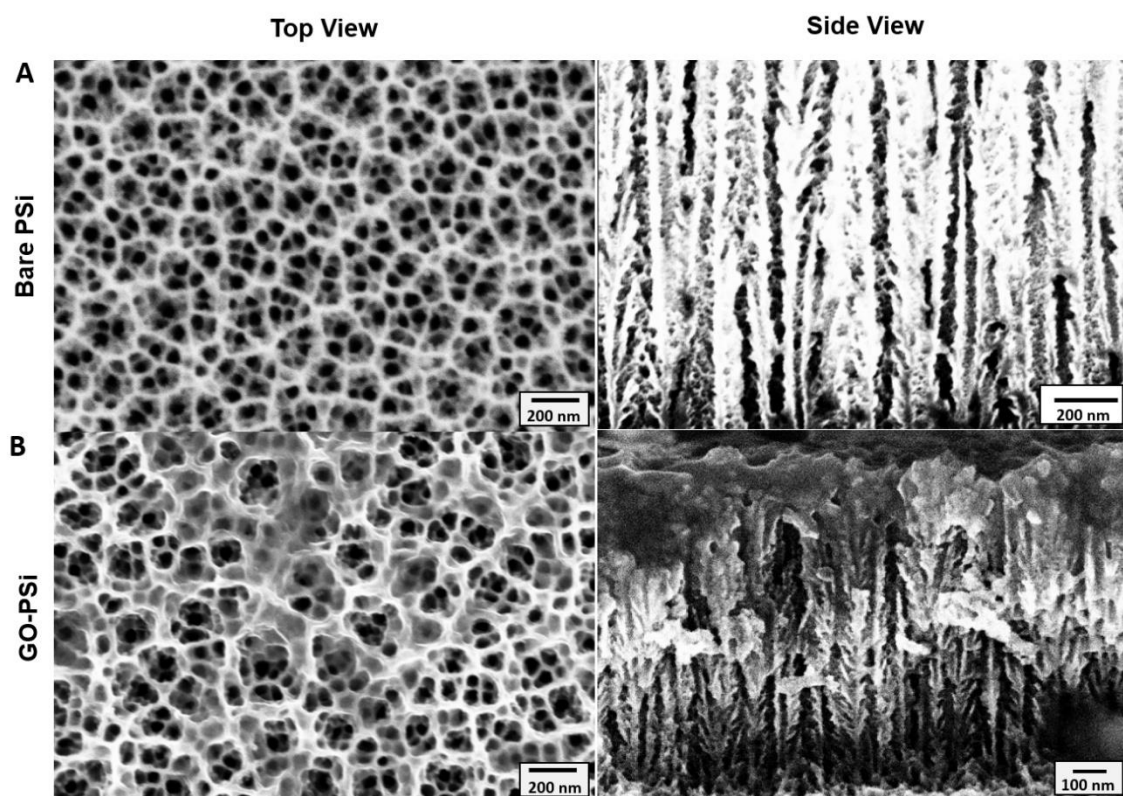


Figure S2. SEM images of the top and side view of PSi before (A) and after GO infiltration (B).

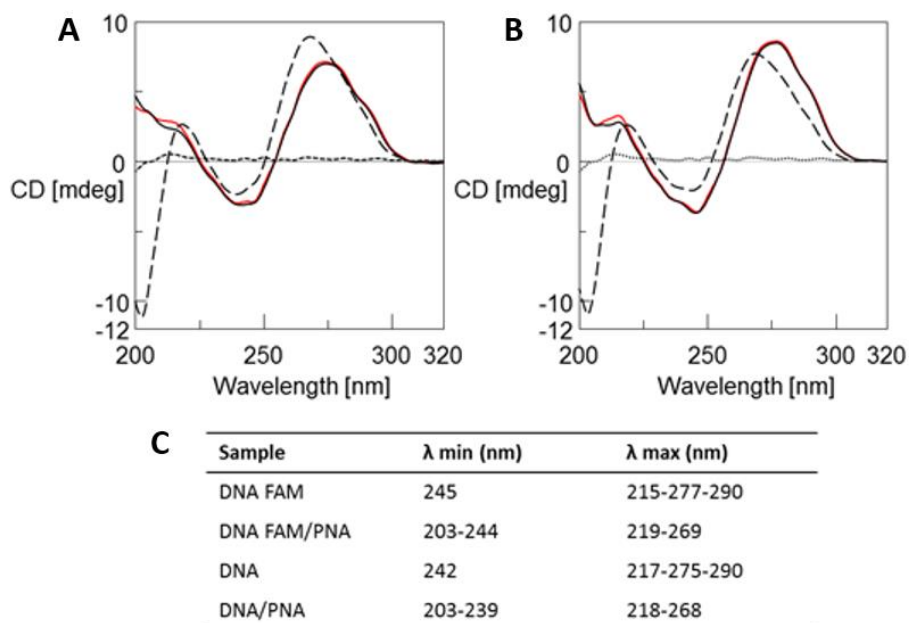
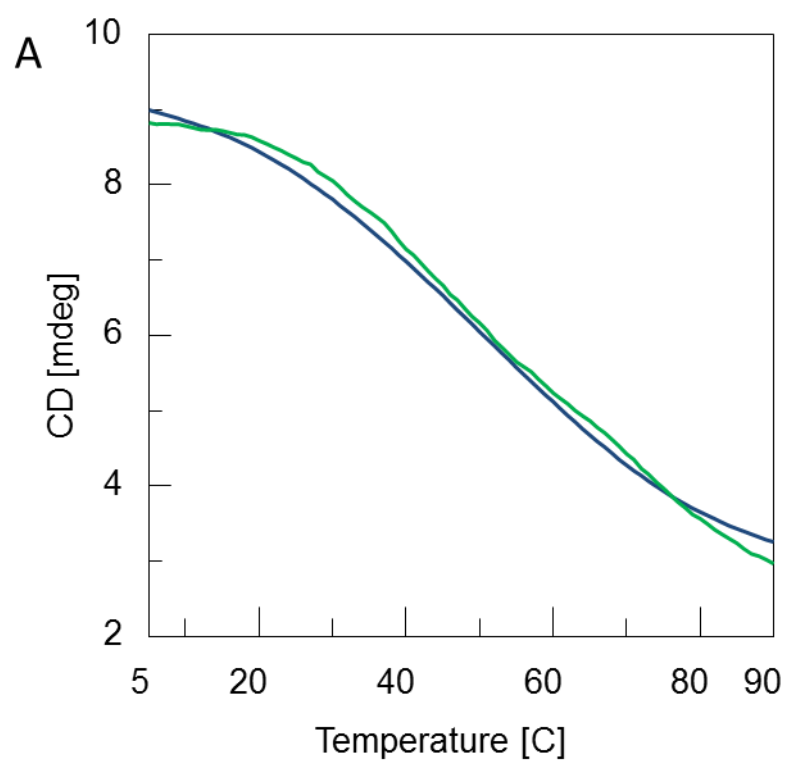


Figure S3: CD spectra of DNA and DNA FAM alone (black solid line, panel A and B respectively) and after annealing with PNA (dashed line A and B). CD profiles of the arithmetic sum of DNA or DNA FAM and PNA are reported as red lines, the CD spectrum of PNA is reported as dotted line. All samples were dissolved in 100 mM PBS. CD profiles were normalized at 320 nm; Table (C) λ values for CD minima and maxima of each sample.

The CD spectra of DNA FAM/PNA and DNA/PNA mixtures were different from that of the arithmetic sum of the separate components, thus confirming that the interaction between both DNA FAM and DNA oligonucleotides (ONs) with PNA occurred (Figure S3 panel A and B, respectively).



B

Samples	Tm °C
DNAwt FAM/PNA	44
DNAwt /PNA	50

Figure S4: A) Overlapped CD melting profiles of DNA FAM/PNA (green line) and DNA/PNA (blue line) mixtures at 1:0.8 ratio. The curves were obtained by monitoring the absorbance at 269 nm for DNA FAM/PNA and 268 nm for DNA/PNA at a heating rate of 1 °C/min; B) Table with Tm values of each sample.

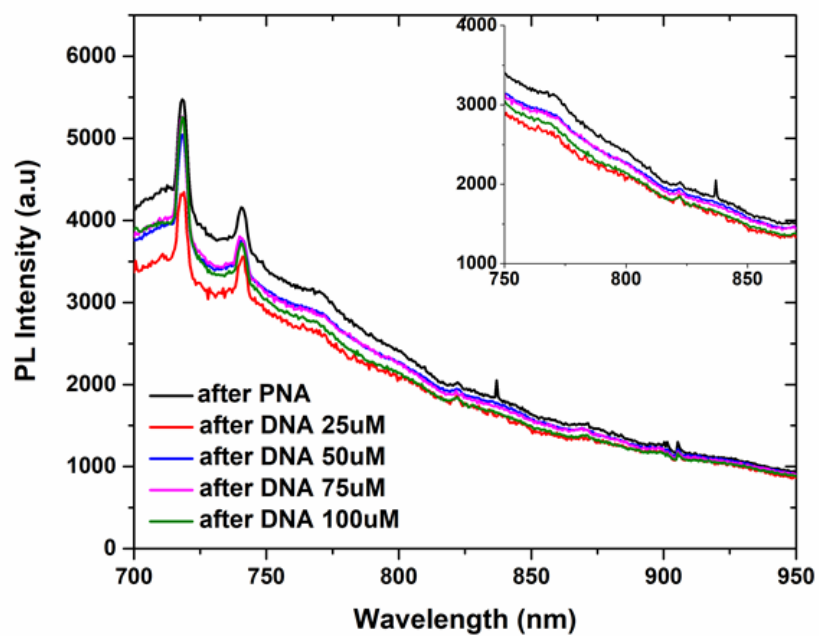


Figure S5. Photoluminescence spectra of PSi-PNA after DNA hybridization.

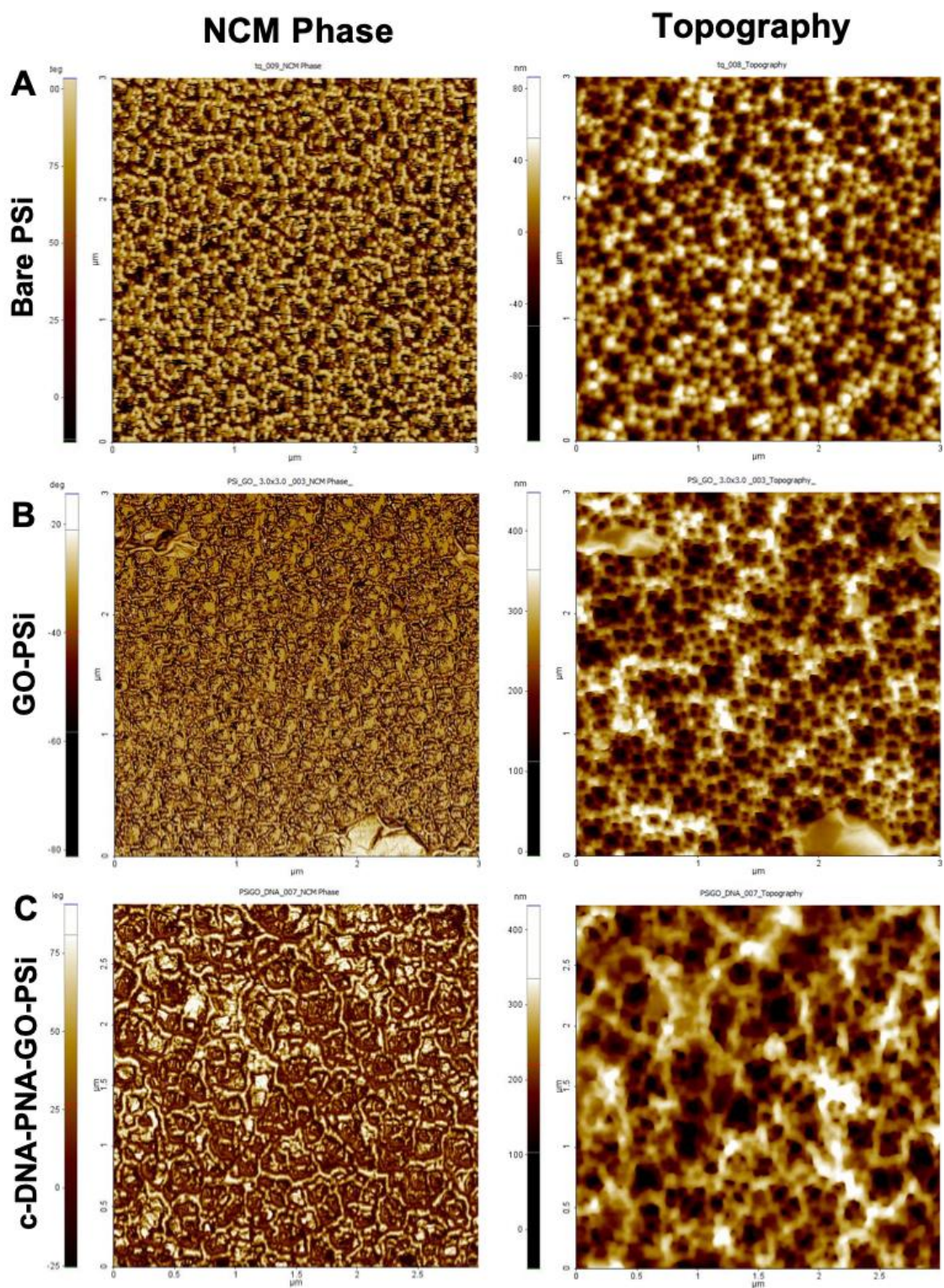


Figure S6. Topography and NCM phase images of bare-PSi (A), GO/PSi (B) and PNA-GO/PSi after DNA hybridization (C).

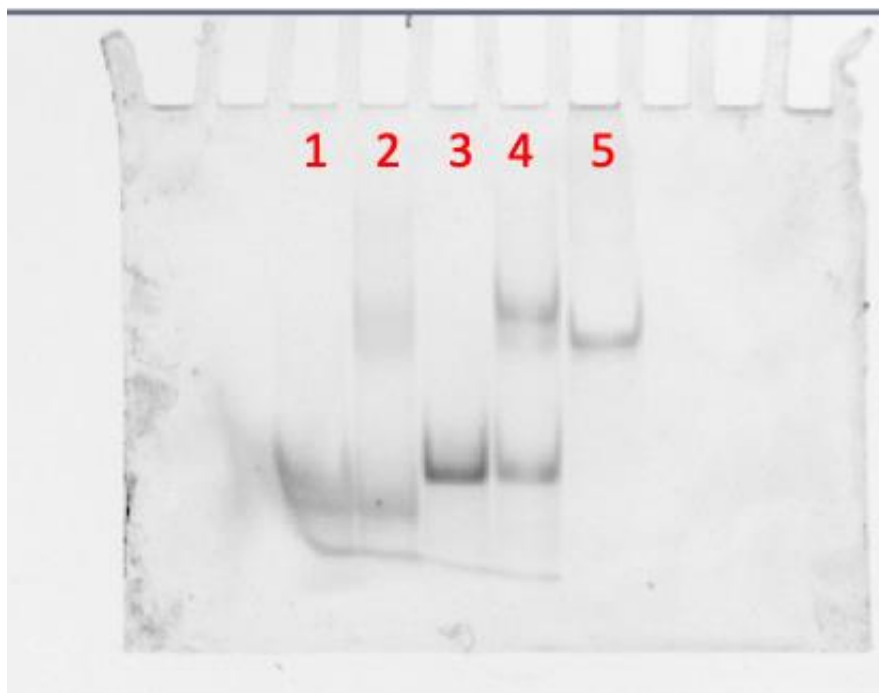


Figure S7: Not processed image of PAGE analysis.