

Amplified Detection of the Aptamer–Vanillin Complex with the Use of Bsm DNA Polymerase

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Table S1. Oligonucleotide sequences used in the work. The underlined sequence is a capture sequence.

Sequence name	Sequence, 5'-3' direction	Comment
B1_bank	CGACCAGCTCATTCTCA-N10- <u>GGAGTCTCGATG</u> -N40-GGATCCGAGCTCACCAGTC	Library for SELEX
B1_biotin	Bio-GTC-Spacer18-CATCGAGACTCC	Capture probe with biotin
B1	CATCGAGACTCC	Capture probe without biotin
DP_biotin	biotin-GTC-spacer18-ACCACATCGAGACTCCTGTGTCCTTT	Bsm dehybridization probe with biotin
DP	ACCACATCGAGACTCCTGTGTCCTTT	Bsm dehybridization probe without biotin
Van_74	CGACCAGCTCATTCTCAGGAGAAACAT <u>GGAGTCTCGAT</u> <u>GATAGTAGGAGCGGCGGA</u> ACGTAGGAAGAGAGGATGACGGAGGATCCGAGCTCACC AGTC	aptamer
FP	FAM-TCTTGGFCFCAGGAGTCTCGATGTGGTATTGTGTCCAAGA-BHQ1	Fluorescence probe for Bsm DNA polymerase
PR	TCTTGGAC	Primer for Bsm DNA polymerase

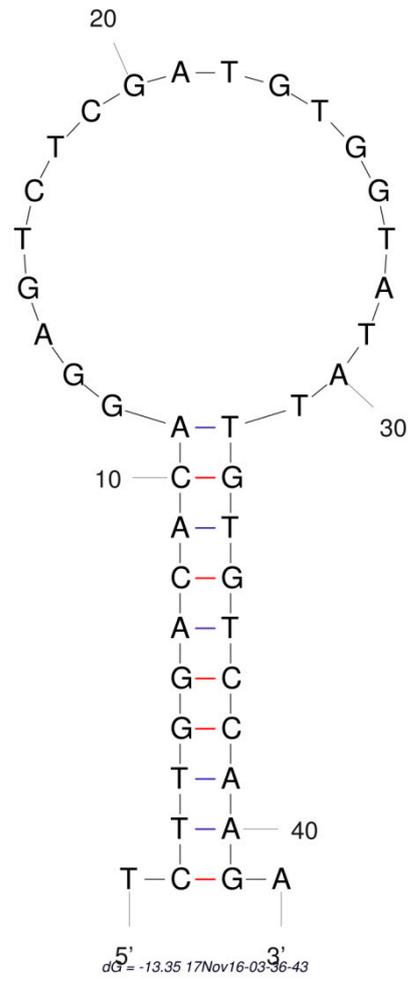


Figure S1. Stem-loop structure for the FP predicted by Mfold web (<http://unafold.rna.albany.edu/?q=mfold>).

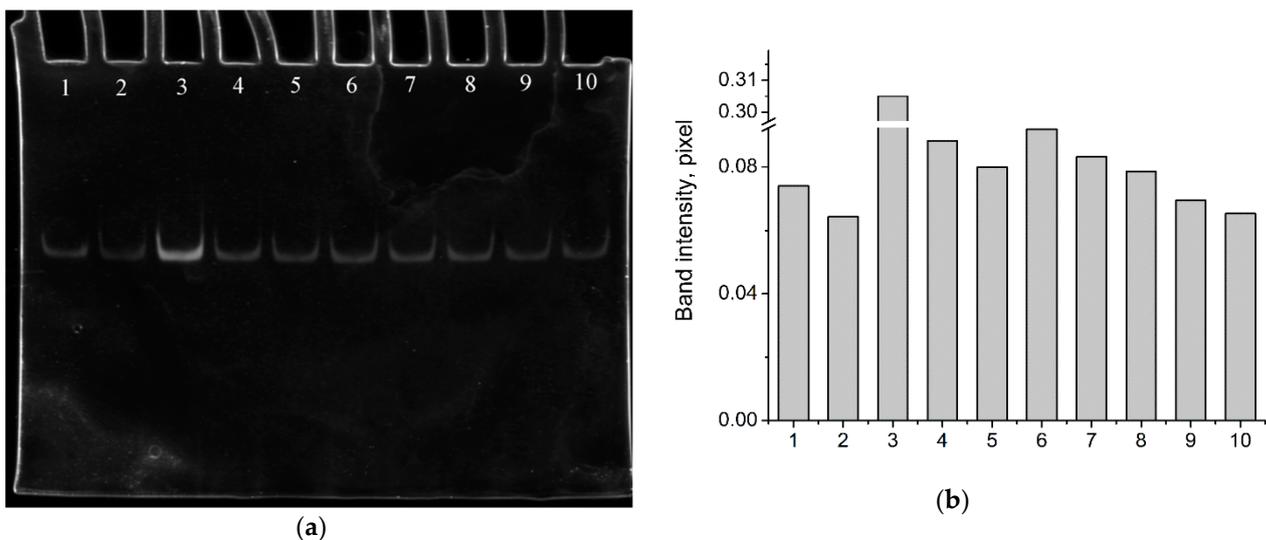
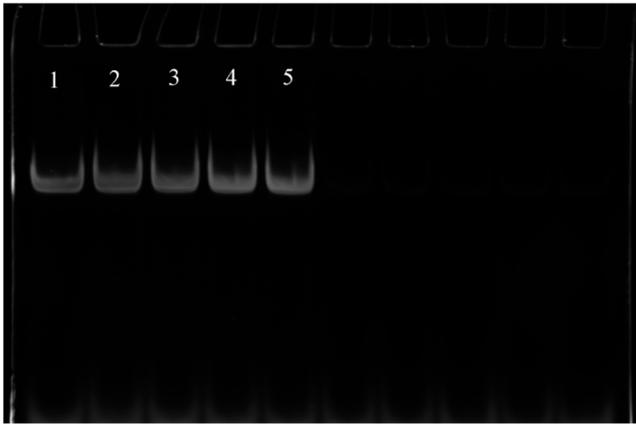
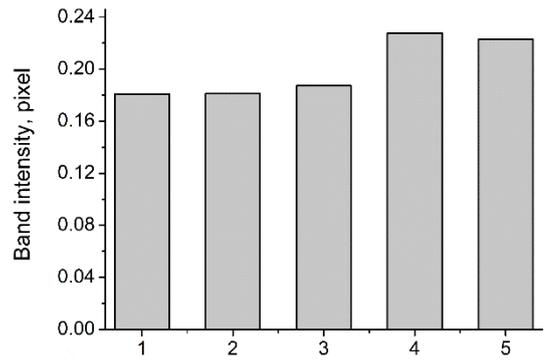


Figure S2. Nondenaturing PAGE (photo without any modification) of PCR amplified (14 cycles) washout probes from magnetic beads modified with B1/Van_74 (a) and image analysis of phoresis with GelQuant.NET (b) for different incubation buffers: 1—Selection buffer with vanillin (1.5 mM), 2—Selection buffer, 3—Bsm buffer with vanillin (1.5 mM), this point doesn't correlate with other measurements, possible pipetting error, 4—Bsm buffer, 5—Bsm buffer with vanillin (1.5 mM), repeat, 6—Bsm buffer, repeat, 7—Bsm buffer with vanillin (1.5 mM), repeat, 8—Bsm buffer, repeat, 9—Selection buffer with vanillin (1.5 mM), repeat, 10—Selection buffer, repeat.



(a)



(b)

Figure S3. Nondenaturing PAGE (photo without any modification) of PCR amplified (14 cycles) washout probes from magnetic beads modified with DP/Van_74 (a) and image analysis of phoresis with GelQuant.NET (b) for different compositions: 1—Selection buffer, 2—Selection buffer, repeat, 3—Selection buffer, repeat, 4—Selection buffer with 1.5 mM of vanillin, 5—Selection buffer with 1.5 mM of vanillin, repeat.

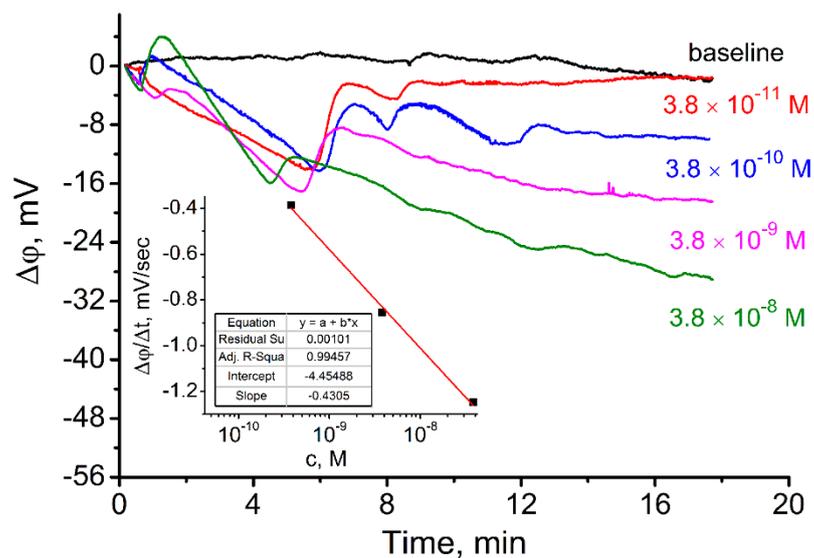


Figure S4. Real time signal of the ISFET (in $\Delta\phi$) during Bsm DNA polymerase reaction in homogenous solution in Bsm buffer initiated (30–40 s) by addition of DP at different concentration (final concentration are marked on the picture); Slope ($\Delta\phi/\Delta t$) dependence on DP concentration calculated from real time signal curves is presented as insert. Reaction conditions: 0.2 mM dNTP, 0.05 pmol/ μ l FP, 1.6 pmol/ μ l PR, 0.1 U/ μ l BSM DNA polymerase.

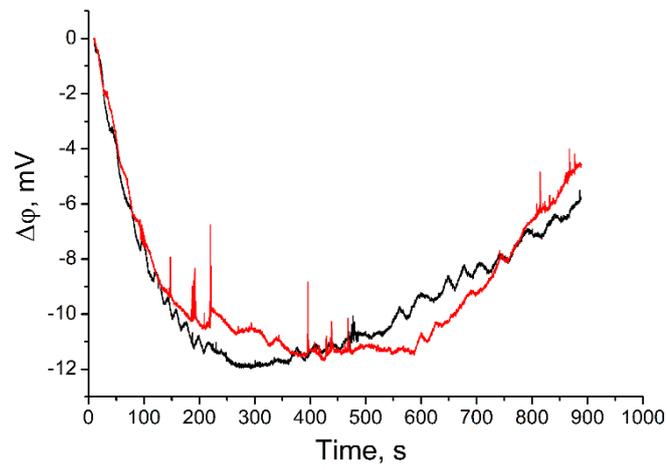


Figure S5. Real time signal of the ISFET (in $\Delta\phi$): black line—Selection buffer with 0.2 mM dNTP, 0.05 pmol/ μ l FP, 1.6 pmol/ μ l PR, 0.1 U/ μ l BSM DNA polymerase, red line—Selection buffer with 0.2 mM dNTP, 0.05 pmol/ μ l FP, 1.6 pmol/ μ l PR, 0.1 U/ μ l BSM DNA polymerase during polymerase reaction initiated by addition of DP (35 s) at concentration of 3×10^{-8} M.

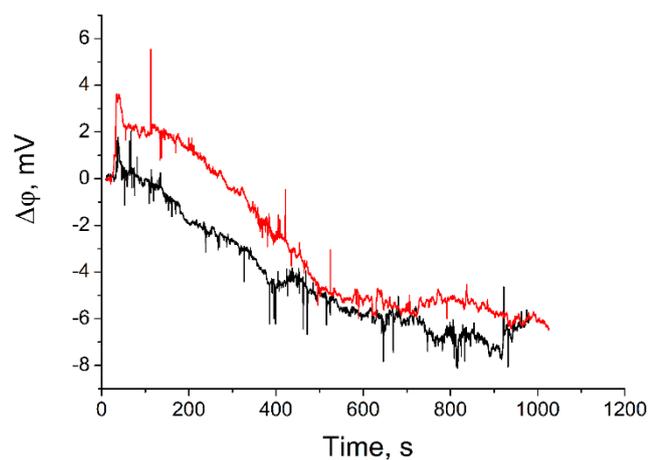


Figure S6. Real time signal of the modified with Van_74 ISFET (in $\Delta\phi$, with background subtraction): black line—Selection buffer with 0.2 mM dNTP, 0.05 pmol/ μl FP, 1.6 pmol/ μl PR, 0.1 U/ μl BSM DNA polymerase during polymerase reaction initiated by addition of DP (32 s) to final concentration 3×10^{-8} M, red line—Selection buffer with 0.2 mM dNTP, 0.32 pmol/ μl DP, 1.6 pmol/ μl PR, 0.1 U/ μl BSM DNA polymerase during polymerase reaction initiated by addition of FP (35 s) to final concentration of 4.8×10^{-8} M.