biosensors

MDPI

Supplementary Materials

Development of a DNA-Based Lateral Flow Strip Membrane Assay for Rapid Screening and Genotyping of Six High-Incidence STD Pathogens

Gunho Choi [1], Keum-Soo Song [1], Satish Balasaheb Nimse [2,*] and Taisun Kim [2,*]

[1] Biometrix Technology, Inc., 2-2 Bio Venture Plaza 56, Chuncheon 24232, Republic of Korea; ghchoi@bmtchip.com (G.C.); hanlimsk@empas.com (K.-S.S.)
[2] Institute of Applied Chemistry and Department of Chemistry, Hallym University, Chuncheon 24252, Republic of Korea
* Correspondence: satish_nimse@hallym.ac.kr (S.B.N.); tskim@hallym.ac.kr (T.K.)

Table S1. DNA templates used for the design and development of probes for the detection of STD pathogens, including *Chlamydia trachomatis* (CT), *Neisseria gonorrhoeae* (NG), *Trichomonas vaginalis* (TV), *Ureaplasma urealyticum* (UU), *Mycoplasma hominis* (MH), and *Mycoplasma genitalium* (MG).

STD Pathogen	Blast Reference for 16S Ribosomal RNA Partial Gene	Sequence
***Chlamydia trachomatis* (CT)**	CP017744.1	CAATGGCCAGTACAGAAGGTAGCAAGATC GTGAGATGGAGCAAATCCTCAAAGCTGGCC CCAGTTCGGATTGTAGTCTGCAACTCGACT ACATGAAGTCGGAATTGCTAGTAATGGCGT GTCAGCCATAACGCCGTGAATACGTTCCCG GGCCTTGTACACACCGCCCGTCACATCATG GGAGTTGGTTTTACCTTAAGTCGTTGACTCA ACCCGCAAGGGAGAGAGGCGCCCAAGGTG AGGCTGATGACTAGGATGAAGTCGTAACAA GGTAGCCCTACCGGAAGGTGGGGCTGGATC ACCTCCTTTTAAGGATAAGGAAGAAGCCTG AGAAGGTTTCTGACTAGGTTGGGCAAGCAT TTATATGTAAGAGCAAGCATTCTATTTCATT TGTGTTGTTA
***Neisseria gonorrhoeae* (NG)**	CP032429.2	ATGGTCGGTACAGAGGGTAGCCAAGCCGC GAGGCGGAGCCAATCTCACAAAACCGATC GTAGTCCGGATTGCACTCTGCAACTCGAGT GCATGAAGTCGGAATCGCTAGTAATCGCAG GTCAGCATACTGCGGTGAATACGTTCCCGG GTCTTGTACACACCGCCCGTCACACCATGG GAGTGGGGGATACCAGAAGTAGGTAGGGT AACCGCAAGGAGTCCGCTTACCACGGTATG CTTCATGACTGGGGTGAAGTCGTAACAAGG TAGCCGTAGGGGAACCTGCGGCTGGATCAC CTCCTTTCTAGAGAAAGAAGGGGCTTTAGG CATTCACACTTATCGGTAAACTGAAAAGAT GCGGAAGAAGCTTGAGTGAAGGCAAGGTT CGCTTAAGAAGGGA

***Trichomonas vaginalis* (TV)**	JX943583.1	CAATGTTAGGATCAATAGGACTGCGAGCCT GAGAGGGTGCGCTACTCTTATAATCCCTAA CGTAGTTGGGATTGACGTTTGTAATCAGCGT CATGAACCAGGAATCCCTTGTAAATGTGTG TCAACAACGCACGTTGAATACGTCCCTGCC CTTTGTACACACCGCCCGTCGCTCCTACCGA TTGGATGACTCGGTGAAATCACCGGATGCT TACGAGCAGAAAGTGATTAAATCACGTTAT CTAGAGGAAGGAGAAGTCGTAACAAGGTA ACGGTAGGTGAACCTGCCGTTGGATCAGTT CTAGTTTTAATAACTAACACCAACTTCTTTT ATTAAACAAAAACCAATACAAAATTAAAA ACTAACTTCATCAAAAACCAAGTCTCTAAG CAATGGATG
***Ureaplasma urealyticum* (UU)**	CP039963.1	AAAAGTTAGTCTCAGTTCGGATAGAGGGCT GCAATTCGCCCTCTTGAAGTTGGAATCACT AGTAATCGCGAATCAGACATGTCGCGGTGA ATACGTTCTCGGGTCTTGTACACACCGCCCG TCAAACTATGGGAGCTGGTAATATCTAAAA CCGCAAAGCTAACCTTTTGGAGGCATGCGT CTAGGGTAGGATCGGTGACTGGAGTTAAGT CGTAACAAGGTATCCCTACGAGAACGTGGG GATGGATCACCTCCTTTCTTCGGAGTAAATT TTTAATTTACGTACTAATAAGTGTACATTTT TATAAAAATCCATGTGAATATTAGCCACTTT TTTAAAAAATATTTCAAAAGTTCATATGGTC GGATTCTATTTAGTTTTGAGAGTTTATTCTCT CCC
***Mycoplasma hominis* (MH)**	FP236530.1	ACAATGGTCGGTACAAAGAGAAGCAATAT GGCGACATGGAGCAAATCTCAAAAAGCCG ATCTCAGTTCGGATTGGAGTCTGCAATTCGA CTCCATGAAGTCGGAATCGCTAGTAATCGC AGATCAGCTATGCTGCGGTGAATACGTTCT CGGGTCTTGTACACACCGCCCGTCACACCA TGGGAGCTGGTAATACCCAAAGTCGGTTTG CTAACCTCGGAGGCGACCGCCTAAGGTAGG ACTGGTGACTGGGGTGAAGTCGTAACAAGG TATCCCTACGAGAACGTGGGGATGGATCAC CTCCTTTCTACGGAGTACAACCTATGTTATG GAAAAAATATTTGTATCCAGTTTTGAGAGA TTTATCTCTCGGTTCTTTGAAAACTGAATAT CGACATTGA
***Mycoplasma genitalium* (MG)**	CP003773.1	CCAACTTGTAAAAGTGAGCAAATCTGAAAA GTTGGTCTCAGTTCGGATTGAGGGCTGCAAT TCGTCCTCATGAAGCTGGAATCACTAGTAA TCGCGAATCAGCTATGTCGCGGTGAATACG TTCTCGGGTCTTGTACACACCGCCCGTCAAA CTATGAAAGCTGGTAATATTTAAAAACGTG TTGCTAACCTTTATTGGAAGTGCATGTCAAG GATAGCACCGGTGATTGGAGTTAAGTCGTA ACAAGGTACCCCTACGAGAACGTGGGGGT

		GGATCACCTCCTTTCAAATGGAGTTTTTATT TTTTTATTTATCTTAAACACCCATTAATTTTT TCGGTGTTAAAACCCAAATCAATGTTTGGT CTCACAACTAACACATTTGGTCAGTTTGTAT CCAG		

Table S2. List of primer candidates used to develop 6 STD Genotyping 9G Test.

STD Pathogen	Primer Names	Sequence (5′ - 3′)	Tm (°C)	CG (%)
***Chlamydia trachomatis* (CT)**	CT-F1	CATCATGGGAGTTGGTTTTACCTT	66.0	41.7
	CT-F2	GTTGGTTTTACCTTAAGACGTTGACTC	64.9	40.7
	CT-F3	GTTGACTCAACCAGCAAGGGAG	67.4	54.5
	CT-R1	CTCAGGCTTCTTCCTTATCCTT	62.0	45.5
	CT-R2	TAGGGCTACCTTGTTACGACTT	61.0	45.5
	CT-R3	GAAGCCTGAGAAGGTTTCTGAC	63.5	50.0
***Neisseria gonorrhoeae* (NG)**	NG-F1	GGTAGGGTAATCGCAAGGAGTCC	67.8	56.5
	NG-F2	GGAGTGGGGGATACCAGAAGTAG	66.0	56.5
	NG-F3	GGGGATACCAGAAGTAAGTAGGGTA	63.5	48
	NG-F4	GTAACCTCAAGGAGTCCGCTTAC	64.3	52.2
	NG-F5	GGGATACCAGCAGTAAGTAGGGTA	63.4	50.0
	NG-R1	TACGGCTACCTTGTTACGACTT	61.9	45.5
	NG-R2	CCTAAAGCCCCTTCTTTCTCTAG	62.7	47.8
	NG-R3	ACCGATAAGTGTGAATGCCTAAAG	64.3	41.7
***Trichomonas vaginalis* (TV)**	TV_F1	ATTGGATGACTCGGTGAAATCA	65.7	40.9
	TV_F2	CTCGGTGAAATCACTGGATGCTTA	68.3	45.8
	TV_F3	GGTGAAATCACTGGATGCTTACGA	68.2	45.8
	TV_F4	TGACTCGATGAAATCACCGGATG	70.4	47.8
	TV_F5	GTGAAATCACTGGATGCTTACGA	65.3	43.5
	TV-R1	TGGTGTTAGTTATTAAAACTAGAACTG	58.2	29.6
	TV-R2	TACCGTTACCTTGTTACGACTT	59.6	40.9
	TV-R3	GGTTTTTGTTTAATAAAAGAAGTTGGTG	63.7	28.6
***Ureaplasma urealyticum* (UU), *Mycoplasma hominis* (MH),**	UU-MH-MG_F1	CGTCACACTATGAGAGCTGGTAAT	63.6	45.8
	UU-MH-MG_F2	CGTCACACTATGAGAGCTGGTAATA	63.5	44
	UU-MH-MG_F3	GTCACACTATGAGAGCTGGTAATA	59.4	41.7

***Mycoplasma genitalium* (MG)**	UU-MH-MG-R1	CCCACGTTCTCGTAGGGATA	64.1	55.0
	UU-MH-MG-R2	CATCCCCACGTTCTCGTAGG	67.0	60.0

F, forward primer; R, reverse primer; Tm, melting temperature; Tm, melting temperature; CG (%), percentage of nucleotides cytosine and guanine in the sequence; Red color sequences, these forward and reverse primer sequences were found to be optimum for PCR of the respective STD pathogen.