

***S. mansoni* glyceraldehyde-3-phosphate dehydrogenase
(GAPDH) gene ([M92359](#))**

Complete sequence of the *Schistosoma mansoni* glyceraldehyde-3-phosphate dehydrogenase gene encoding a major surface antigen

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1 caacgatcgc cattatthtag atcagatgat atagacttaa attatthttcc gcctaattat
61 attcgatgat thttctgtaac cactacaatc cactcagtaa acaatathttt tatgacttaa
121 gacaccggag thattthtatt tgagataatg thcctthctta thtcaagtga aaaacattat
181 tatcatgtac gaagaatagc thcaatatta thtaatactt tgthttgttt taataaccta
241 agthtatatat actgctgctt gtgccatcag cgaagtcacg tacgatatac thcaagatgt
301 cgagagcaaa ggttggtatt aacggtthttg gtcgtatcgg gagacttgta cthcgtgcag
361 cthttcctcaa gaacaccgtg gatgtagthtt cgggtgaatga cccctthcata gatttagagt
421 atatggtgta catgataaaa cgtgattcca cthcatgggac athttccaggc gaggthttcga
481 ctgaaaacgg aaagthtaaaa gtcaatggga agthtaatata agthtcattgt gaaagagatc
541 cagcaaacat cccgtgggat aaggacgggg ctgaatatgt cgttgagtct actggagtct
601 thacgacctt tgataaagct caggtaatat caththcttgt athatctagt gthcacttha
661 ggctcatatt aaaaataatc gagctaaaaa ggtcataata thcgcacctt ctgcagatgc
721 acccatgttc gthgttggtg tgaatgaaaa thcgtatgaa aagthctatgt ccgtggthtc
781 taacgcatca tgtacaacta athgthttagc acctctggct aaggthcattc atgataagth
841 tgaaatagth gagggtthaa tgaccactgt gcactcathh acggctacac aaaaggtthg
901 agatggacca thctcaaaat thtgccgaga thggccgtgga gcgatgcaaa ataththtcc
961 agctthcact ggtgctgcca aagctgtggg ahaagthcatt ccagcactaa accgaaaath
1021 aacgggaatg gctthcccg gthccaacacc agacgththca gthcgttgatc tgacatgtag
1081 gthtagggaag ggagctthct atgaggaaat caaggctgca gthtaagcag ctgcathctgg
1141 accathgaag gggaththttg aatacactga agatgaggth gthcagthcag actthgtthgg
1201 aagthaccagt thcatctatct thgatgcaaa ggctgggata thctthtaaca acaactthcgt
1261 gaaathtagth thcatggtatg ththcatata thgtthattcc cthactthatt thcatgtagth
1321 atgataatga gthttggatac agthtgcccg tagthtgatct cathacgcac atgcataaag
1381 thgacctatc athaatgaagt agththcaact gthagccgact aactththttg caathcgatg
1441 athaacgaata aagcgththaat ctgcctacth athththcaat thctththtath acacagcaat
1501 caaacathgt thgtththctt ccgtthththt gthtaagcagc cagthgtgatg t
```

PCR product: 206bp
Annealing temperature= 53.2C

Sequence

Filename : Sm GAPDH gene ([M92359](#))
Length : 1551 bp
Unresolved : 0 bp
GC % : 38.4 %

Upper primer

5'-position : 1064
Length : 22
Sequence : 5' -GTTGATCTGACATGTAGGTTAG-3'
3'-GATTGGATGTACAGTCTAGTTG-5'

Tm (basic) : 62.0 °C
Tm (salt) : 58.4 °C
Tm (NN) : 53.8 °C

GC % : 40.9 %
3'-tail GC % : 42.9 %
dG : -34.6 kcal/mol
3'-tail dG : -10.5 kcal/mol

Lower primer

5'-position : 1269
Length : 21
Sequence : 5' -ACTAATTTACGAAGTTGTTG-3'
3'-GTTGTTGAAGCACTTTAATCA-5'

Tm (basic) : 56.0 °C
Tm (salt) : 53.5 °C
Tm (NN) : 54.4 °C

GC % : 33.3 %
3'-tail GC % : 42.9 %
dG : -35.3 kcal/mol
3'-tail dG : -10.5 kcal/mol

Primer pair properties

Length difference : 1
Tm (basic) difference: 6.0 °C
Tm (salt) difference : 4.9 °C
Tm (NN) difference : 0.7 °C
GC % difference : 7.6 %

PCR product

Position : 1064 - 1269

Length : 206 bp

GC% : 42.7 %

Tm(product) : 74.1 :C

Tm(annealing) : 53.2 :C

Upper primer self annealing:

5'-GTTGATCTGACATGTAGGTTAG-3'

: : ||||| : :

3'-GATTGGATGTACAGTCTAGTTG-5'

dG: -4.86 kcal/mol

5'-GTTGATCTGACATGTAGGTTAG-3'

||||

3'-GATTGGATGTACAGTCTAGTTG-5'

dG: -1.41 kcal/mol

Upper primer loops:

None!

Lower primer self annealing:

5'-ACTAATTCACGAAGTTGTTG-3'

||||

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: -2.16 kcal/mol

5'-ACTAATTCACGAAGTTGTTG-3'

: :: ||| ::: :: :

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: -0.31 kcal/mol

5'-ACTAATTCACGAAGTTGTTG-3'

||| : : :::

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: 0.27 kcal/mol

Lower primer loops:

5'-ACTAATTT

|||)

3'-GTTGTTGAAGCAC

dG: 0.39 kcal/mol

Upper primer - Lower primer annealing:

5'-GTTGATCTGACATGTAGGTTAG-3'

: : ||||

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: -1.30 kcal/mol

5'-GTTGATCTGACATGTAGGTTAG-3'

||| ::

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: -0.31 kcal/mol

5'-GTTGATCTGACATGTAGGTTAG-3'

||| ::

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: -0.31 kcal/mol

5'-GTTGATCTGACATGTAGGTTAG-3'

||| : :: :

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: -0.08 kcal/mol

5'-GTTGATCTGACATGTAGGTTAG-3'

:: : |||

3'-GTTGTTGAAGCACTTTAATCA-5'

dG: 0.65 kcal/mol