



AUTHENTICATION REPORT

Prepared for

Dr. Heidi Hehnly and Judy Freshour

July 2023

Project Name: HHEH02

Transgenic Method: Mosaic Clutch - Tol2

Reporter: *Sox17::EMTB-GFP* in Tol2

Summary: The Tol2 transgenesis method inserts genetic cargo at random locations in the *Danio rerio* genome. The client desired delivery of embryos that have been injected with Tol2 plasmid and Tol2 mRNA then screened for mosaic expression of the fluorescent marker in the region of interest. F0 injected animals should be raised to adulthood in your facility and outcrossed with WT lines to identify an F0 founder transmitting the appropriate expression in their germline. F1 embryos from this F0 founder should be raised to adulthood and outcrossed to generate a heterozygous line.



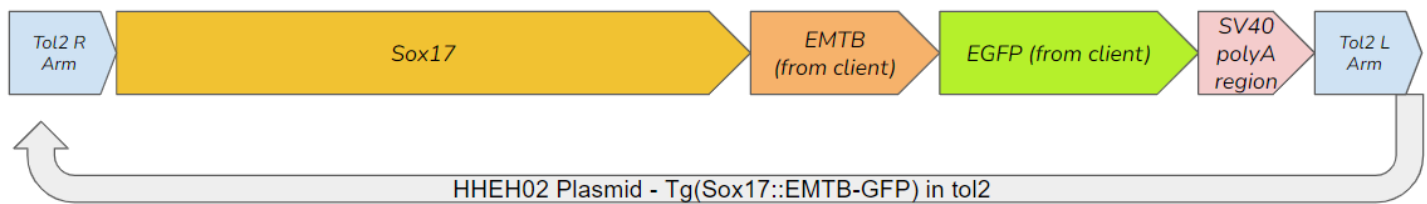
PLASMID MAP:

HHEH02 - Sox17::EMTB-GFP in Tol2 (12265 bp)

The sequence file for your Tol2 plasmid can be found here:

<https://invivobiosystems.benchling.com/s/seq-czFuxLMtUrxKtOOGP54K?m=slm-lEdYSUiOADJHAIAxzWgl>

Tol2 Plasmid:



Plasmid Size: 12265 bp

Insert Size: 9205 bp

Tol2 R arm: 536 bp total

sox17 promoter: 5497 bp

EMTB (from client): 804 bp

3xEGFP (from client): 2255 bp

SV40 polyA region: 539 bp

Tol2 L arm: 517 bp total

METHOD OF VALIDATION:

The sequence of the entire insert of the Tol2 donor plasmid was verified by a combination of nanopore and Sanger sequencing before injections. The Tol2 plasmid, phenol red injection dye, and Tol2 transposase mRNA were injected into 1-cell ABC (wild-type) zebrafish embryos.

INJECTION MIXTURE (2 nL per 1 cell embryo):

Tol2 plasmid (25 ng/μL)

Tol2 (25 ng/μL)

Phenol red injection dye

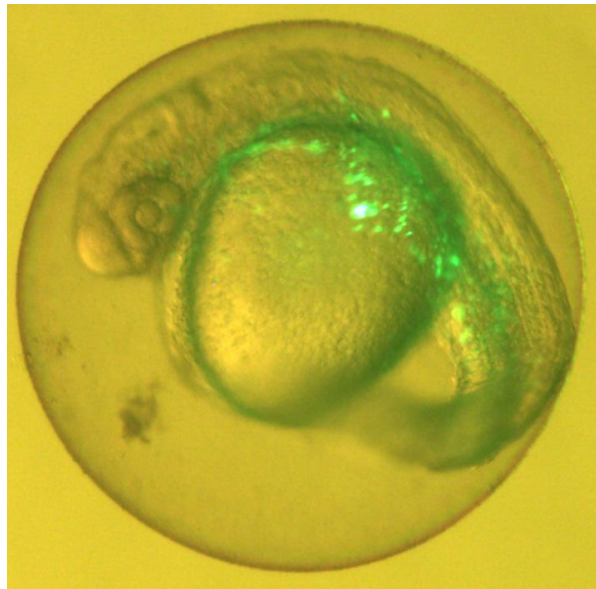


Certificate of Authenticity

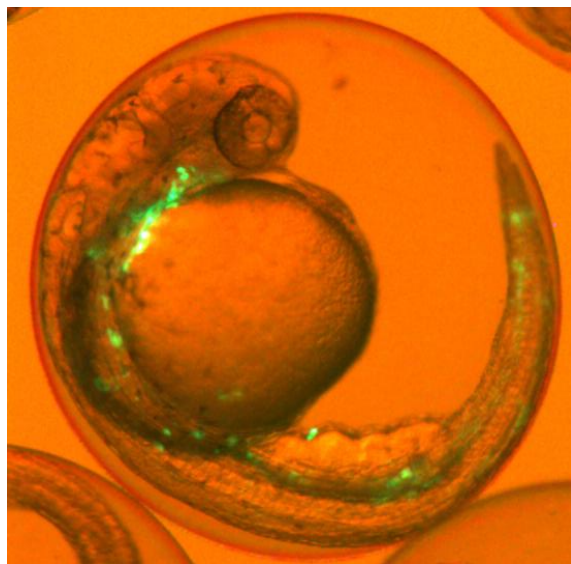


Robust expression of *Sox17::EMTB-GFP* in the developing 24 hpf larvae. The expression pattern is similar to that using the previously tested *Sox17::EGFP* control plasmid (see below).

HHEH02 *Sox17::EMTB-GFP* F0 Injected Embryo at 24 hpf



Sox17::EMTB-GFP F0 Injected Embryo at 24 hpf





Certificate of Authenticity

PLASMID SEQUENCE:

Sox17::EMTB-GFP in tol2 (12265 bp)

GGTGTCTGAAACACAGGCCAGATGGGCCCTCGAGCAGGAAACAGCTATGACCATGATTACGCCAAG
CTATCAACTTTGTATAGAAAAGTTGACGCGTatgtggttgagaaacactgctctagagcatttagactggttttaacctgtc
ttctcttttggcaatatgatagatgagtttgggtatggaggttgccaggagaatgggacttgctgactgcattgtgccaattgggtatgttgg
tggtggataatggtgtaagattgttttcaggtgttggtcccttagttctgacagaacgacttaggaggcagataaacatcttattatgaattgtt
ttggcaattcaagtatgtcaactatgattcaggtcttggcatgagcctaaatgatgaatgcagggcagagacgacccccaggtcaacctac
actctctgacaaaaggtagacggtaggacaaaaaatgttctataaggaacagtttgtaccttgtaaaagttgtacctgtttgaaaaaagac
ctcttatgatacttttctgtactttttatggtacaactgaaataaaggtagacaaattgtttcataaaacagtaaaataagtgttgacaactccttctt
tgttacaatatccatgaaaaataaataattactggaaaggcaaatgtattatgaataagtgaagtttattagaaactaattcaagaggatcac
atgcttatgattgcttgggtccacaatatccaattatgattaccattcagacgattcctaagccactataattacaataagttccatatcacagtc
atcttcatttgaagaatccctcctccaccctactactccttcttagatgggtggcacagtcgcccagtggttgcactgttgctcacagc
aagaacgtcactggttctagacctaccaagccagatgagtttctgtgcaagttacacattctccttatgtgctcatgtgggttccacaggtt
ccccgttctccaccgtccaaaaacatgcaacttaattatagactaatccaaataggcaccttagacattctcctaacatgctccgaactta
tctcttaagagtaactactattgttcattagctacagcaggggagttctcgagatctactgagctcagacttgctctcaccttgcaaacggg
aggagccccaggcttgaggatcggtgagctcagggctctctccgggacagcatgcaaacacgcttataatcaatcatcagctaagt
gtgaacacctgaactccgcattattacatgaatcatcattaaaaatcatatgtttaaagaaactcataaacattaattattaattctataatacaa
aaccactggaaaaacatataactataggtattgtaaactaaacatttagggcattttaataacacttttattaaacattttctgatagatccctt
tcattattgatatccactatcaattgttccactaagcaagtgtgagctggcaaaagtcctgtacatgcaaagtggtcatgcagacatttagtact
gtaaaactaatcaaacattgtgcaaatcttttacaatacttttgcgtaattctatttctatttcaaaattaagtaaaattaactttaaaagtgc
tttaaagggtattatgtgaaaattagagtttttttattgtacatgggagaatgttttagcaaaaaacagattttgatttatgttaaagttttttaaat
tctttattgtaaagtgaagaggtgcatttacacaaaaataaacttttttaaaacattgtttaataaatgaattagctgtttatattactgaaaat
aaattaacccatttagatatagcaaaaaggctttaaatagttctgaagggaacacatttgacactgttaaggtacaaagtgtctgttactgta
gtggtacctcatggatcggtattgtacctttagtaaggtacaatatgtatttacaggttttaaaaagccaaaggtacattttgatttcctatgg
tacaatcatgtccttaaatgtacaaactgcaatagtacaaaattgttttgccttacggtacaactctgttcataaaaaagtggtgccccagtg
acaagggttgtacattcttagtactacattctaccatttttctgagagtgtatggacagagaaatcgattgtttaatatatgtatatatagc
gtgcttgtgtcatataggctgaaggataattattatgaataactaaattagattagattcttgcattagattcttctcgtagaccttctgtgt
agctttaacttgactgaaaggaactattacccttggatgatcttagaattctttatttctgtttgttctatgggtgaaaaatgaccgtattcact
aaacaccttactaaagcaacacaattttatttaaattctcagatccaattgcacaaagaaacgacctcatcattcatcagctaccctttaatga
ctgggttttccatgttgggtgtagttgtcatcaatgttcaatcaactggcaccacaatttttcttcattcattatccgacggcttgtcccttat
ttatcagggatcaccacagcagaatgaaccgccaactatttaacatatgttttacacagcagatgcccttcagatgcaacctagtacagaga
aacgcccagtcactcacattcccactcatacactatggccaatttagttattcaattcacctatagcgcatgtgttggactgtgggggaaacca
gagcacgcggaggaaactcgcgcaaacatggggaaaacatgcaaactctatacagaaatgtcaactgaccagccgggactcgaactag
tgaccttctgtgtaaggcaacagtgtcaaccactgagccactgtgtgccccaccactcggtttgactgaagtaaaggttaaaaagtatac
atttctaaatctaaatctgtacagccttcattaaaaatagagaattgttctttatttataatgtctgttcattttagaaaaaaatcataatacttcat
aatatatattttaaataaaaataataatataatataattttaaaatggttatggctcactattatttgcgttttaagtacttgagtacagtcaaccg
cctctgaatgccttcagcctgccttacctaagcggtattccctgatttccatccatcatccacctcctctgtttggagtttatctgcctgccattt



Certificate of Authenticity

gatctgccattcaattgtttctgtttgttctactgactctgacctcgctgacttcagcacaagcctgtcctttctggttctgctgcctttcgtgcct
aaaactttttgacctggctgacaaatatttacagtctgacctaccaagtgggtacagtcttcttggtttggtaataaatcagatgttatttaacc
tgtacatgagctcactctctcccactgccctcaagactaccatatcccgctcaggtatttataacttttttgatgctaacatgtgaggcaccact
aaggcctaggggagtctgggatggagtcaggggtgggtgggtgggtgtactacttaaccatatttgaagcatatttgcacctccctaca
gggatgtctgtatttgtaaaaacaaaatagaataaaaaatagcacagctcttatttgaaaatgcccaaaatgcctaaaatgggacttttggg
gggttaaacttttagtgtttataattagctgagtaaaagcatttaaaaacgtcccgttagagaagaaaacgtgtgtgtgtttgtatatgggag
aggtcttccacccttatctacgtatagtgcttcagcctgcatttctgtccccacaaactgcttctgtccttggcgttggagcacatactgtccg
ccttcagacaaacacacctctccctcacagtcaaactcgcacatagactcacactcatgaaaaatacacacatactgtcgccagtgcaagccttt
gtggggaattacacaatagcattggctcctgagtgccaggggactttacatgagtcagacggaagttgtatatgcgttcacactcaccactta
cacacgcatgggtccattgtgtgtccatttgttcttttggagtgaatagatgatgtgagctatatgtcagaactcagtgatttggatgaatcta
gaatctgcattacagtgactccaaccaacactaaaaataacttctattaaaaagtttctaaagaagtttctctaaaaacttctattaagcatac
actcctgtgtaaaaattcaaatcaagataagcagaaaaataggatgtggtttctgtagttcccaataattcctgtaacctgcacaggagctttta
gttctcaaaacatttacaacttacctgcataacagccttcatgataacaagccactgcaaaccttatgttagtgattctgtcacatggattacaac
agtttgacaacagcagaaatgtcagctacagtattcaataagtgttgggtttattttttatttaataataattcagtaaacctattaaactccttc
aaagcttattttacttttagaataaagatcagactcaaaaactgctttttattatgacctctcaaagtaatttagtagagaaactggcattgtagctt
ctactaaatacatcatatacaaagttaacaccttctttcacacgcatttggcacgaccttatcaacgtgtgacaatctttcacctactagcctacta
ctgtttgcaaattcaggctgtatctactggcaggatattaatcctaaaccaaactgtgtatttgcgtatccgtgtggcaaataattaaaccttcac
ttgctatgataaacgtttaccaacatttaaatcgcttttagtttcaaacgaaaatagataaacctttaaacctgtcctttaatgcaaaaaaagtagaa
ttataaagtttggagaagttcatgaatgcttccgtatatagattggacgctgttcttgcaatgtgttttgaacaataaataaagaaagaaagccg
tcttaacgaaactgtgtgcttcttaaagatcaatgacagatgggcaaaacatgcaaatggttgcaacgcttatcactttacttattagtgcaa
cgcagcagattttgtagcttaaatgttttaataagagaaccttctggaaagcagaatttctaataattgtcgtccagatgatgataggctctac
acaagaactgattctttcacacctttaactgcgcggtccgcccacattagcgctattgggtggctgctgagtttaagctgcctgaaactttact
gtggattttctgacctttcatgttgaatgaactgtatgcactcagcaaaaggacagttgagcagaggaaaaatttaaaagatcagcttttaggcca
ttcaggtttcatcggtgatcaataaggatacgcgccccggtgctgttttgcgacgcccaccATGGCGCCAGTGC GAAGCGA
AACAGCACCCGACAGCTACAAAGTGCAAGATAAGAAAAATGCCTCCAGCCGCCCTGCCTCTGCAAT
TTCAGGACAAAATAACAACCACTCAGGAAATAAACAGACCCTCCGCCTGTGTTACGTGTTGATGAC
CGGCAGCGGCTGGCCCGGGAGCGACGTGAGGAACGGGAGAAACAGCTAGCTGCAAGAGAAATAGT
GTGGTTAGAAAGAGAAGAGCGAGCCAGGCAGCACTACGAGAAGCACCTGGAAGAGCGGAAGAAG
AGGTTGGAGGAGCAGAGGCAGAAGGAGGAGCGGAGGAGGGCTGCTGTGGAGGAGAAGCGGAGG
CAGAGACTTGAGGAGGACAAAGAACGCCACGAAGCTGTTGTACGGCGCACAATGGAAAGGAGCCA
GAAGCCAAAACAGAAGCATAACCGTTGGTCGTGGGGAGGCTCTCTCCATGGGAGCCCTAGCATCCA
CAGTGCAGATCCAGACAGGCGGTCAGTTTCCACCATGAATCTTTCGAAATATGTTGATCCCGTCATTA
GCAAGCGGCTCTCCTCTTCATCTGCAACTTTACTAAATTCTCCAGATAGAGCTCGCCGCCTGCAGCTC
AGCCCATGGGAGAGCAGCGTTGTTAACAGACTCCTGACGCCACACATTCGTTTCTGGCCAGAAGTA
AAAGCACAGCTGCCTTGTCTGGAGAAGCAGCATCTTGACGCCCCATCATCATGCCCTACAAAGCTGC
AACTCTAGAAATTCGATGGATCGACCAAACTCTTTGTAACACCACCTGAGGGCTCTTCGGATCCA
CCGGTCGCCACCATGGTGAGCAAGGGCGAGGAGCTGTTACCGGGGTGGTGCCCATCCTGGTTCGAG



Certificate of Authenticity



CTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTAC
GGCAAGCTGACCCTGAAGTTCATCTGCACCACCGGCAAGCTGCCCCTGGCCCACCCTCGTGA
CCACCCTGACCTACGGCGTGCAAGTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTT
CAAGTCCGCCATGCCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTA
CAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCA
TCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAACAGCCACAAC
GTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAACTTCAAGATCCGCCACAACATCG
AGGACGGCAGCGTGCAAGTTCGCGGACCACTACCAGCAGAACACCCCCATCGGGCGACGGCCCCGTGC
TGCTGCCCCGACAACCACTACCTGAGCACCCAGTCCGCCCTGAGCAAAGACCCCAACGAGAAGCGCG
ATCACATGGTCTGCTGGAGTTCGTGACCGCCGCGGGATCACTCTCGGCATGGACGAGCTGTACAA
GGGAAGTGGACCGCGGGATATCCCTGAGGGCTCTTCGGATCCACCGGTGCGCACCATGGTGAGCAA
GGGCGAGGAGCTGTTACCGGGGTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCA
CAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCAT
CTGCACCACCGGCAAGCTGCCCCTGCCCTGGCCCACCCTCGTGACCACCCTGACCTACGGCGTGCAAG
TGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCCCCGAAGGCT
ACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTACAAGACCCGCGCCGAGGTGAAGT
TCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAGGAGGACGGCAAC
ATCCTGGGGCACAAGCTGGAGTACAACAGCCACAACGTCTATATCATGGCCGACAAGCAG
AAGAACGGCATCAAGGTGAACTTCAAGATCCGCCACAACATCGAGGACGGCAGCGTGCAAGTTCGCG
GACCACTACCAGCAGAACACCCCCATCGGGCGACGGCCCCGTGCTGCTGCCCCGACAACCACTACCTG
AGCACCCAGTCCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTGCTGGAGTTC
GTGACCGCCGCGGGATCACTCTCGGCATGGACGAGCTGTACAAGGAAAGCGGGCCACGGTACCCCG
CGGGCCCGGGATCCACCGGTGCGCACCATGGTGAGCAAGGGCGAGGAGCTGTTACCGGGGTGGTG
CCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGCGAGGGCGAG
GGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCACCGGCAAGCTGCCCCTGCCCT
GGCCCACCCTCGTGACCACCCTGACCTACGGCGTGCAAGTTCAGCCGCTACCCCGACCACATGAA
GCAGCACGACTTCTTCAAGTCCGCCATGCCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAG
GACGACGGCAACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCAT
CGAGCTGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAAC
ACAACAGCCACAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAACTTCAAGA
TCCGCCACAACATCGAGGACGGCAGCGTGCAAGTTCGCGGACCACTACCAGCAGAACACCCCCATCG
GCGACGGCCCCGTGCTGCTGCCCCGACAACCACTACCTGAGCACCCAGTCCGCCCTGAGCAAAGACC
CCAACGAGAAGCGCGATCACATGGTCTGCTGGAGTTCGTGACCGCCGCGGGATCACTCTCGGCAT
GGACGAGCTGTACAAGTAAACCCAGCTTTCTTGTACAAAGTGGGGGATCCAGACATGATAAGATACA
TTGATGAGTTTGGACAAACCACAACACTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGA
TGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACAACAACAATTGCATTCAATT
TATGTTTCAGGTTCAAGGGGGAGGTGTGGGAGGTTTTTTCCAACCTTTATTATACATAGTTGATAATTAC



Certificate of Authenticity



TGCCCGTCGTTTTACGGTACCATCGATGATGATCCAGACATGATAAGATACATTGATGAGTTTGGACA
AACCACAACCTAGAAATGCAGTGAAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTG
TAACCATTATAAGCTGCAATAAACAAGTTAACAACAACAATTGCATTCATTTTATGTTTCAGGTTTCAG
GGGGAGGTGTGGGAGGTTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTATGGCTGATTATGATC
CTCTAGATCAGATCTGCGAAGATACGGCCACGGGTGCTCTTGATCCTGTGGCTGATTTTGGACTGTGC
TGCTCGCAGCTGCTGATGAATCACATACTTCCTCCATTTTCTTCCACTGATTGACTGTTATAATTTCCCT
AATTTCCAGGTCAAGGTGCTGTGCATTGTGGTAATAGATGTGACATGACGTCACTTCCAAAGGACCA
ATGAACATGTCTGACCAATTTTCATATAATGTGAAAACGATTTTCATAGGCAGAATAAATAACATTTAA
ATTAAACTGGGCATCAGCGCAATTCAATTGTTTTGGTAATAGCAAGGGAAAATAGAATGAAGTGATC
TCCAAAAAATAAGTACTTTTTGACTGTAAATAAAATTGTAAGGAGTAAAAAGTACTTTTTTTCTAAA
AAAATGTAATTAAGTAAAAGTAAAAGTATTGATTTTTAATTGTACTCAAGTAAAGTAAAAATCCCCA
AAAATAATACTTAAGTACAGTAATCAAGTAAAATTACTCAAGTACTTTACACCTCTGGACGAAAGGG
CCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCAGGTGGCAC
TTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCT
CATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATT
TCCGTGTGCGCCTTATTCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGTCTACCCAGAAACGCTGG
TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACA
GCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCT
GCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTGCGCGCATACACTATT
CTCAGAATGACTTGTTGAGTACTCACAGTACAGAAAAGCATCTTACGGATGGCATGACAGTAAG
AGAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG
GAGGACCGAAGGAGCTAACCGCTTTTTTGACAACATGGGGGATCATGTAACCTGCCTTGATCGTTG
GGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGC
AACACGTTGCGCAAACCTATTAAGTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC
TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTG
CTGATAAATCTGGAGCCGGTGAGCGTGATCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAA
GCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACAG
ATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAAActgtcagaccaagttactcatatatacttttagattgattta
aaacttcatttttaatttaaaaggatctaggtgaagatccttttgataatctcatgacaaaatcccttaacgtgagtttctgtccactgagcgtc
agaccccgtagaaaagatcaaagatcttcTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAA
AAACCACCGCTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAA
CTGGCTTCAGCAGAGCGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTC
AAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGC
TGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTA
CAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAG
CGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATA



Certificate of Authenticity



GTCCTGTCGGGTTTTGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGC
CTATGGAAAaacgccagcaacgcgccttttacggttcctggccttttgctggcctttgctcacatgttcttctgcttatcccctgattc
tgtggataaccgtattaccgcctttgagtgagctgataccgctcgccgcagccgaacgaccgagcgcagcgagtcagtgagcgaggaagc
ggaagagcgccCAGAGGTGTAAAAAGTACTCAAAAATTTTACTCAAGTGAAAGTACAAGTACTTAGGG
AAAATTTTACTCAATTAAGTAAAAGTATCTGGCTAGAAATCTTACTTGAGTAAAAGTAAAAAAGTA
CTCCATTAATAATTGTAAGTATTAAGGAAGTAAAAGTAAAAGCAAGAAAGAAAACTAGAGATT
CTTGTTTAAGCTTTTAATCTCAAAAAACATTAAATGAAATGCATACAAGGTTTTATCCTGCTTTAGAA
CTGTTTGTATTTAATTATCAAACCTATAAGACAGACAATCTAATGCCAGTACACGCTACTCAAAGTTGTA
AAACCTCAGATTTAACTTCAGTAGAAGCTGATTCTCAAATTGTTAGTGTCAAGCCTAGCTCTTTTGG
GGCTGAAAAGCAATCCTGCAGTGCTGAAAAGCCTCTCACAGGCAGCCGATGCGGGAAGAGGTGTAT
TAGTCTTGATAGAGAGGCTGCAAATAGCAGGAAACGTGAGCAGAGACTCCCT