**Supplenmental Table 1** The primes for qRT-PCR and vector construction of *MdVPE* genes

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| --- | --- | --- | --- |
| Gene ID | Forward primes | Reverse primes | Usage |
| qMDP0000122571 | CGAGGCCGGGAGTTATCATC | CATGGCGACCTGATCCTCTC | qRT-PCR |
| qMDP0000256408 | GGGCAGACCTGAAAGAACCT | TGCACGAATACCTCCCATCG |
| qMDP0000084203 | GTCATCATTAACAGCCCGCAT | CTTCCCACTACCCCCTGTAA |
| qMDP0000241162 | GGGTAGTGGGAAGGTTGTGG | TGCATAGACTTGATATCTCCAAGAA |
| qMDP0000937205 | AAGGTTCTGCTTAGCGGTCC | CGCCATCAGTAGGCATAGCA |
| qMDP0000188488 | TAAGCCAGATGGCCCTGATG | CCCCGCTGAGAGCTGTTTTA |
| qMDP0000165304 | TGGATGCCCAGCGATTATGT | GCTTCGAACTTGAAAGGAGGC |
| qMDP0000166283 | CGCGTACAACTCGGAAAATCC | CCTCCGGTGAGAGCACTTTT |
| qMDP0000172014 | CAGCCGCTTGTTGATGACTG | GCCATCTGCTCCTGTGTCAT |
| qMDP0000227138 | GGAGGAAGTGGCAAGGTTCT | TCTTCTTCGAACCATGCTTTTGT |
| qMDP0000227977 | ATGTCGATTGAATTACAGGTTCG | ATCGCTGGTGGAAGTATGGC |
| qMDP0000248773 | AGGCCCACAAGTACTCAACG | GTTGCAGATGTTTGCCAGGG |
| qMDP0000256148 | TGAGGAGTGGCGAAATGGAA | ATTGCCGTCACCTTCTCGTT |
| qMDP0000321943 | GCTACCACTGCGTCAAATGC | ACTTATGTCACTGCAATCCTCC |
| qMDP0000759605 | CAAGGGCTCTTCACGTACCA | TGGCATATGTCAGCCTGGTG |
| qMDP0000292165 | GTGAAATGGCACTCTCACGC | TAAATGGTCCCCGGTCCAAC |
| qMDP0000243227 | GGCGGTGGCTGCGTATTT | ATCGAGAGGTGCAGACCAGA |
| qMDP0000196515 | GCTTGTTGATGTCAACCGCA | TTGGTACCAGTTGCAGGTGT |
| Md-actin | TAAGGCTGGATTTGCTGGAG | GCATCTTTCTGACCCATTCC |
| At-18S | TTGCGTTTGAGAGGATGTGG | TCCATAAGTCGGGGTTTGTTG |  |
| MDP0000172014 | CACCATCACGCCATGGTCGACATGACTCGGTTGGCCAGCG | TCTATCGATCAATCAGGATCCTCACGCACTGAATCCCCG | vector construction |