**Oligonucleotides used in the quadriplex real time PCR *emm* typing assays.**

**Reference**: Velusamy et al. (2021). Sequential Quadriplex Real-Time PCR for Identifying 20 Common emm Types of Group A Streptococcus. Journal of Clinical Microbiology 59 (1): e01764-20. doi: 10.1128/JCM.01764-20. Print 2020 Dec 17.

|  |  |  |
| --- | --- | --- |
| Name | Oligonucleotide Sequence (5’ – 3’) | Optimal Concentration(nM) |
| Emm1-F | GTGATGGTARTCCTAGGRAAGTT | 400 |
| Emm1-P | FAM/TRCGGGA<BHQ1dT>TGTTTGCTGCAAGADR/Spc6 | 100 |
| Emm1-R | CATTGCATTCTCTAATCTCGCTTT  | 400 |
| Emm2-F | CAGTTAAGGCGAACAGTAAGAACCC | 200 |
| Emm2-P | Cy5/AAATTAAG<BHQ2dT>GAAGCAGAATTACATGACAAA/Spc6 | 200 |
| Emm2-R | GCTCTTCTTCAACTTTATCTAATTTCTCGAATA | 200 |
| Emm3-F | GCAGACAGTAAAGGCAGATG | 300 |
| Emm3-P | ROX/TRGGAGTGT<BHQ2dT>AATGVAGAGTTTYCTAGRCA/Spc6 | 300 |
| Emm3-R | CCTGATHTAACAAGTTCTCAGTTTC | 300 |
| Emm4-F | CTGRTTCAGCGYGGAACT | 300 |
| Emm4-P | Cy5/CTRAARAA<BHQ2dT>ATAACGYGTTASTTVASGAAAATGAGG/Spc6 | 200 |
| Emm4-R | TYCACGTTCTACCTTGARC | 300 |
| Emm6-F | TATTCGCTTAGAAAATTAAAAACAGG | 300 |
| Emm6-P | Cy5/TGAAGTTAG<BHQ2dT>GCAAGAGYGTTTYCTRGGG/Spc6 | 100 |
| Emm6-R | TGTTAASYTGTCATTATTAGCTT | 300 |
| Emm11-F | GGCTTTGCAAAYCAAACAGAAG | 300 |
| Emm11-P | HEX/TYCTAAAGS<BHQ1dT>AMAAACGTGAKCGCA/Spc6 | 300 |
| Emm11-R | TTCATCCCATAGCGAATTATATAGG | 300 |
| Emm12-F | AGATCATAGTGATTTAGTCGCAGAA | 300 |
| Emm12-P | ROX/TTTGVAAGAC<BHQ2dT>GAAACRGCDTTCAG/Spc6 | 300 |
| Emm12-R | ATAGTATTGCTGAAGGTAGDDTT  | 300 |
| Emm28-F | GRCTTYTGCTAATGGARCTGRT | 400 |
| Emm28-P | FAM/AGYTGM<BHQ1dT>GYATACAACACATTGCTTACTG/Spc6 | 100 |
| Emm28-R | ACTCATCWCYGAGTTTCTCATGTT  | 400 |
| Emm49/151-F\* | TGCGGAGAATAACGTGTMTA | 400 |
| Emm49/151-P | HEX/CGTATAGY<BHQ1dT>CTTTTTCTCTTCTTGCAACGC/Spc6 | 300 |
| Emm49/151-R | CCTATTCTTTCTAGATATTCTCCGT | 400 |
| Emm59-F | CTTTGCAAACCAAACAGAAGTTAAG | 200 |
| Emm59-P | FAM/AAATACGA<BHQ1dT>GYATTGACTAATGAGAATAAGTCT/Spc6 | 100 |
| Emm59-R | TAATTTAAATAGTTATCTCTCTCTCTTCTAA | 200 |
| Emm75-F | TATGAAGCAYRATACAAAGCATGG | 300 |
| Emm75-P | FAM/AATTA<BHQ1dT>AGAARGACCTTAGATAAGTTTAATAC/Spc6 | 100 |
| Emm75-R | CTAATCTCGTAGTCTTACCTTGCTCA | 300 |
| Emm76-F | TGCAAACCAAACAGAAGTTAAGG | 300 |
| Emm76-P | ROX/TGASCTACAGGC<BHQ2dT>GAACATGATAAGYT/Spc6 | 300 |
| Emm76-R | GTTCAGYCAATAGCTCMTYAT | 300 |
| Emm77-F | TGCAAACCAAACAGAAGTTARGG | 300 |
| Emm77-P | ROX/AGTGATGCA<BHQ2dT>CTGAACCTACAGAAACCC/Spc6 | 200 |
| Emm77-R | AAGGTCTGTAATGCGGTTATGT | 300 |
| Emm81-F | TGCAAACCAAACAGAAGTTAAGG | 300 |
| Emm81-P | HEX/TGCGGG<BHQ1dT>YCAGAAGARAATGTACYG/Spc6 | 300 |
| Emm81-R | TTSAAGTTTGGCTATGTATKTCCG | 300 |
| Emm82-F | ATCACTGAGGCAGGTGTATCTA | 300 |
| Emm82-P | Cy5/TGGAAGAG<BHQ2dT>ARGTTTGATGCAGAGCA/Spc6 | 300 |
| Emm82-R | TTTCAAGCTCGTTTGCTCTATTC  | 300 |
| Emm83-F | CCAGACAGAAGTTAAGGCTGATAAC | 400 |
| Emm83-P | Cy5/CAATGCAG<BHQ2dT>AACACAAGRGSRCRC/Spc6 | 200 |
| Emm83-R | TCCATTTCATGTAACAAATTCTGAAGC | 400 |
| Emm87-F | CYAGAGAAGTARCCARCGAA | 200 |
| Emm87-P | FAM/TTGGYTGC<BHQ1dT>TCARTGYGGAAGAAA/Spc6 | 200 |
| Emm87-R | CTTTCCTTCTATTTCAGAGTAATCC | 200 |
| Emm89-F | TAAGGCGGACAGTGACAAT | 300 |
| Emm89-P | HEX/TGTCTCTG<BHQ1dT>CRAAGATAATGAAARAGAATTACATAACAVA/Spc6 | 300 |
| Emm89-R | CATCTATTTTGTCTAGATGTTCTCCT  | 300 |
| Emm92-F | GATGACCGGAGCGTTTCTAC | 200 |
| Emm92-P | HEX/AATAGTGG<BHQ1dT>AGCGTGAGCACAYCA/Spc6 | 300 |
| Emm92-R | AGCTCACCATGTTTAGCCAATA | 200 |
| Emm118-F | GCGGACAGTAACGCG | 300 |
| Emm118-P | ROX/TCTAGCGT<BHQ2dT>GCAAAGCTATACAACCAAAT/Spc6 | 200 |
| Emm118-R | CTCCGTTTTTATCTGTAAGATCG | 300 |

\*assay targets both *emm*49 and *emm*151 types