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| --- | --- | --- |
| Gene | Primers | Sequences（5′→3′） |
| β-actin | β-actin-F | CCACGAAACTACCTTCAACTCC |
| β-actin-R | GTGATCTCCTTCTGCATCCTGT |
| PD-L1 | PD-L1-F | ACTTGCTACGGGCGTTTACT |
| PD-L1-R | CTCTCCCCCTGAAGTTGCTG |
| VEGF-A | VEGF-A-F | TTCGTCCAACTTCTGGGCTC |
| VEGF-A-R | ACAGCAGTAAAGCCAGGGTC |
| FOXP3 | FOXP3-F | CACCTATGCCACCCTTA CCG |
| FOXP3-R | CATGCGAGTAAACCAATGGTAGA |
| HIF-1a | HIF-1a-F | TTGACAAGCTAGCCGGAGGA |
| HIF-1a-R | GGGGAAGTGGCAACTGATGA |
| IFN-γ | IFN-γ-F | GCTTTGCAGCTCTTCCTCATG |
| IFN-γ-R | TCTTCCACATCTATGCCACTTGA |
| IL-12P40 | IL-12-F | TGGTTTGCCATCGTTTTGCTG |
| IL-12-R | ACAGGTGAGGTTCACTGTTTCT |
| IL-2 | IL-2-F | CGGCATGTTCTGGATTTGACT |
| IL-2-R | TCATCATCGAATTGGCACTCA |
| IL-4 | IL-4-F | TTGAACGAGGTCACAGGAGAAG |
| IL-4-R | CCTTGGAAGCCCTACAGACG |
| IL-10 | IL-10-F | GCTCTTACTGACTGGCATGAG |
| IL-10-R | CGCAGCTCTAGGAGCATGTG |
| TNF-α | TNF-α-F | AAGGGAGAGTGGTCAGGTTGCC |
| TNF-α-R | CCTCAGGGAAGAGTCTGGAAAGG |
| IL-15 | IL-15-F | ATGTTCATCAACACGTCCTGACT |
| IL-15-R | GCAGCAGGTGGAGGTACCTTAA |

Supplement table 1. Primer sequences for real-time qPCR