**Table S1.** Real-time PCR primer sequences 1**.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Target gene** | **Primer sequence Forward (5’→3’)** | **Primer sequence Reverse (5’→3’)** | **Temperature (°C)** | **Accession number** |
| ***Hepcidin*** | AGCAGGAGCAGGATGAGC | GCCAGGGGATTTGTTTGT | 59.3 | JQ246442.1 |
| ***LEAP-2A*** | TGCCTACTGCCAGAACCA | AATCGGTTGGCTGTAGGA | 59.3 | FJ390414 |
| ***LEAP-2B*** | TGTGCCATTAGCGACTTCTGAG | ATGATTCGCCACAAAGGGG | 59.3 | KT625603 |
| ***β-defensin-1*** | TTGCTTGTCCTTGCCGTCT | AATCCTTTGCCACAGCCTAA | 58.4 | KT445868 |
| ***Mucin2*** | GAGTTCCCAACCCAACACAT | AAAGGTCTACACAATCTGCCC | 60.4 | KT625602 |
| ***TGF-β1*** | TTGGGACTTGTGCTCTAT | AGTTCTGCTGGGATGTTT | 55.9 | EU099588 |
| ***TGF-β2*** | TACATTGACAGCAAGGTGGTG | TCTTGTTGGGGATGATGTAGTT | 55.9 | KM279716 |
| ***IL-4/13A*** | CTACTGCTCGCTTTCGCTGT | CCCAGTTTTCAGTTCTCTCAGG | 55.9 | KT445871 |
| ***IL-4/13B*** | TGTGAACCAGACCCTACATAACC | TTCAGGACCTTTGCTGCTTG | 55.9 | KT625600 |
| ***IL-10*** | AATCCCTTTGATTTTGCC | GTGCCTTATCCTACAGTATGTG | 61.4 | HQ388294 |
| ***IL-11*** | GGTTCAAGTCTCTTCCAGCGAT | TGCGTGTTATTTTGTTCAGCCA | 57.0 | KT445870 |
| ***TNF-α*** | CGCTGCTGTCTGCTTCAC | CCTGGTCCTGGTTCACTC | 58.4 | HQ696609 |
| ***IFN-γ2*** | TGTTTGATGACTTTGGGATG | TCAGGACCCGCAGGAAGAC | 60.4 | JX657682 |
| ***IL-1β*** | AGAGTTTGGTGAAGAAGAGG | TTATTGTGGTTACGCTGGA | 57.1 | JQ692172 |
| ***IL-6*** | CAGCAGAATGGGGGAGTTATC | CTCGCAGAGTCTTGACATCCTT | 62.3 | KC535507.1 |
| ***IL-8*** | ATGAGTCTTAGAGGTCTGGGT | ACAGTGAGGGCTAGGAGGG | 60.3 | JN663841 |
| ***IL-12p35*** | TGGAAAAGGAGGGGAAGATG | AGACGGACGCTGTGTGAGTGTA | 55.4 | KF944667.1 |
| ***IL-12p40*** | ACAAAGATGAAAAACTGGAGGC | GTGTGTGGTTTAGGTAGGAGCC | 59.0 | KF944668.1 |
| ***IL-15*** | CCTTCCAACAATCTCGCTTC | AACACATCTTCCAGTTCTCCTT | 61.4 | KT445872 |
| ***IL-17D*** | GTGTCCAGGAGAGCACCAAG | GCGAGAGGCTGAGGAAGTTT | 62.3 | KF245426.1 |
| ***TOR*** | TCCCACTTTCCACCAACT | ACACCTCCACCTTCTCCA | 61.4 | JX854449 |
| ***S6K1*** | TGGAGGAGGTAATGGACG | ACATAAAGCAGCCTGACG | 54.0 | EF373673 |
| ***4E-BP1*** | GCTGGCTGAGTTTGTGGTTG | CGAGTCGTGCTAAAAAGGGTC | 60.3 | KT757305 |
| ***4E-BP2*** | CACTTTATTCTCCACCACCCC | TTCATTGAGGATGTTCTTGCC | 60.3 | KT757306 |
| ***NF-κBp65*** | GAAGAAGGATGTGGGAGATG | TGTTGTCGTAGATGGGCTGAG | 62.3 | KJ526214 |
| ***NF-κBp52*** | TCAGTGTAACGACAACGGGAT | ATACTTCAGCCACACCTCTCTTAG | 58.4 | KM279720 |
| ***c-Rel*** | GCGTCTATGCTTCCAGATTTACC | ACTGCCACTGTTCTTGTTCACC | 59.3 | KT445865 |
| ***IκBα*** | TCTTGCCATTATTCACGAGG | TGTTACCACAGTCATCCACCA | 62.3 | KJ125069 |
| ***IKKα*** | GGCTACGCCAAAGACCTG | CGGACCTCGCCATTCATA | 60.3 | KM279718 |
| ***IKKβ*** | GTGGCGGTGGATTATTGG | GCACGGGTTGCCAGTTTG | 60.3 | KP125491 |
| ***IKKγ*** | AGAGGCTCGTCATAGTGG | CTGTGATTGGCTTGCTTT | 58.4 | KM079079 |
| ***β-actin*** | GGCTGTGCTGTCCCTGTA | GGGCATAACCCTCGTAGAT | 61.4 | M25013 |

1 LEAP-2, liver expressed antimicrobial peptide 2; TGF-β, transforming growth factor β; IL, interleukin; TNF-α, tumor necrosis factor α; IFN-γ2, interferon γ2; TOR, target of rapamycin; S6K1, ribosomal protein S6 kinase 1; 4E-BP, eIF4E-binding protein; NF-κB, nuclear factor kappa B; IκBα, inhibitor of κBα; IKK, IκB kinase.

**Table S2.** Correlation coefficient of parameters in PI, MI and DI of young grass carp.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Independentparameters | Dependentparameters | PI | MI | DI |  |
| Correlationcoefficients | *P* | Correlationcoefficients | *P* | Correlationcoefficients | *P* |
| p-TOR Ser 2448 protein level | TGF-β1 | + 0.903 | <0.05 | +0.923 | <0.01 | + 0.910 | <0.05 |
|  | TGF-β2 | +0.980 | <0.01 | — | — | — | — |
|  | IL-4/13A | +0.958 | <0.01 | +0.876 | <0.05 | +0.921 | <0.01 |
|  | IL-10 | +0.974 | <0.01 | +0.960 | <0.01 | +0.945 | <0.01 |
|  | IL-11 | +0.982 | <0.01 | +0.969 | <0.01 | +0.812 | <0.05 |
|  | S6K1 | +0.927 | <0.01 | +0.992 | <0.01 | +0.881 | <0.05 |
|  | 4E-BP2 | -0.928 | <0.01 | -0.904 | <0.05 | -0.926 | <0.01 |
| NF-κB p65 protein level | IFN-γ2 | +0.825 | <0.05 | +0.845 | <0.05 | +0.977 | <0.01 |
|  | IL-1β | +0.879 | <0.05 | +0.895 | <0.05 | +0.931 | <0.01 |
|  | IL-6 | +0.839 | <0.05 | +0.915 | <0.01 | +0.906 | <0.05 |
|  | IL-8 | — | — | +0.888 | <0.05 | +0.938 | <0.01 |
|  | IL-12p35 | +0.828 | <0.05 | +0.931 | <0.01 | +0.961 | <0.01 |
|  | IL-12p40 | +0.975 | <0.01 | +0.964 | <0.01 | +0.935 | <0.01 |
|  | IL-15 | +0.977 | <0.01 | +0.820 | <0.05 | +0.930 | <0.01 |
|  | IL-17D | +0.930 | <0.01 | +0.955 | <0.01 | +0.970 | <0.01 |
| c-Rel | IFN-γ2 | +0.928 | <0.01 | +0.997 | <0.01 | +0.915 | <0.05 |
|  | IL-1β | +0.960 | <0.01 | +0.992 | <0.01 | +0.957 | <0.01 |
|  | IL-6 | +0.912 | <0.05 | +0.970 | <0.01 | +0.985 | <0.01 |
|  | IL-8 | — | — | +0.969 | <0.01 | +0.983 | <0.01 |
|  | IL-12p35 | +0.906 | <0.05 | +0.970 | <0.01 | +0.894 | <0.05 |
|  | IL-12p40 | +0.962 | <0.01 | +0.948 | <0.01 | +0.944 | <0.01 |
|  | IL-15 | +0.974 | <0.01 | +0.979 | <0.01 | +0.899 | <0.05 |
|  | IL-17D | +0.950 | <0.01 | +0.930 | <0.01 | +0.921 | <0.01 |
| IκBα | NF-κBp65 protein level | -0.990 | <0.01 | -0.947 | <0.01 | -0.970 | <0.01 |
|  | c-Rel | -0.928 | <0.01 | -0.956 | <0.01 | -0.954 | <0.01 |
| IKKα | IκBα | -0.900 | <0.05 | -0.956 | <0.01 | -0.985 | <0.01 |
| IKKβ | IκBα | -0.858 | <0.05 | -0.960 | <0.01 | -0.877 | <0.01 |
| IKKγ | IκBα | -0.974 | <0.01 | -0.977 | <0.01 | -0.902 | <0.05 |

**Fig. S1.**



**Fig. S1.** The enteritis symptom in young grass carp (*Ctenopharyngodon idella*) after injection with physiological saline (Saline group) or *A. hydrophila* (*A. hydrophila* group, control group).

**Fig. S2.**

****

****

**Fig. S2.** The changes of immune components in the PI, MI and DI of young grass carp (*Ctenopharyngodon idella*) after injection with physiological saline (saline) or *A. hydrophila* (control).Data represent means of six fish in saline group and control group, error bars indicate SD. The data of two groups are subjected to unpaired student`s *t*-test to determine significant differences at *P* < 0.05.