**Normal Light-dark and Short-Light Cycles Regulate Intestinal Inflammation, Circulating Short-chain Fatty Acids and Gut Microbiota in *Period2* Gene Knockout Mice**

**Supplementary Materials**

**Table S1: Specific primers used for RT-PCR**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Primer Name | Sequence (5’-3’) | GenBank accession |
| *Per2* | *Per2*-F | TGTGCGATGATGATTCGTGA | XM\_006529250.5 |
| *Per2*-R | GGTGAAGGTACGTTTGGTTTGC |
| *Per1* | *Per1*-F | GAAACGGCAAGCGGATGGA | NM\_011065.5 |
| *Per1*-R | GGAAGGTGAAGAAGCCACCA |
| *Per3* | *Per3*-F | AAAAGATCCTGACCTCGCCC | NM\_001289877.1 |
| *Per3-*R | AGTGGACCCTGCTTGAACAC |
| *Cry1* | *Cry1*-F | CACTGGTTCCGAAAGGGACTC | NM\_007771.3 |
| *Cry1*-R | CTGAAGCAAAAATCGCCACCT |
| *Cry2* | *Cry2*-F | GGTTCCGCAAAGGACTACGG | NM\_009963.4 |
| *Cry2*-R | ATCGGTTGATGCCCACAGAC |
| *Clock* | *Clock*-F | CTTCCTGGTAACGCGAGAAAG | XM\_011249402.3 |
| *Clock*-R | TCGAATCTCACTAGCATCTGACT |
| *Bmal1* | *Bmal1*-F | CCACCTCAGAGCCATTGATACA | XM\_030242022.2 |
| *Bmal1*-R | GAGCAGGTTTAGTTCCACTTTGTCT |
| *Rev-erbα* | *Rev-erbα*-F | TACATTGGCTCTAGTGGCTCC | NM\_145434.4 |
| *Rev-erbα*-R | CAGTAGGTGATGGTGGGAAGTA |
| *Nhe1* | *Nhe1*-F | GAAGATAGGCAAGGAACCCGA | NM\_001358455.1 |
| *Nhe1*-R | GAGATGGTGGGGATCACATGG |
| *Nhe2* | *Nhe2*-F | CAGGGCTTCCACTTCAACCT | NM\_001033289.2 |
| *Nhe2*-R | TCCGAGTCGCTGCTATTTCC |
| *Nhe3* | *Nhe3*-F | GTGACTGGCGTGGATTGT | NM\_001081060.2 |
| *Nhe3*-R | AGCAGGAAGGCGAAGATA |
| *Mct1* | *Mct1*-F | AGTGCAACGACCAGTGAAGT | NM\_009196.4 |
| *Mct1*-R | GCGATCATTACTGGACGGCT |
| *Mct4* | *Mct4*-F | CAAGGTGCCTGAGTCTTCCTAA | NM\_030696.3 |
| *Mct4*-R | ATGGTGTGCTGCCAAACAGTA |
| *Ae2* | *Ae2*-F | AAACATCTCAGCGGGCTCTC | NM\_009207.3  |
| *Ae2*-R | CTATCCACCTCCAGTCGGGT |
| *NA+/K+ ATPase* | *NA+/K+ ATPase* -F | AGCCGAGGATTAACACCTGC | NM\_144900.2  |
| *NA+/K+ ATPase* -R | TCTGTAGCACTTCGGATGCC |
| *Il-1β* | *Il-1β*-F | TGCCACCTTTTGACAGTGATG | NM\_008361.4 |
| *Il-1β*-R | ATGTGCTGCTGCGAGATTTG |
| *Il-6* | *Il-6-*F | TGATGGATGCTACCAAACTGGA | NM\_001314054.1 |
| *Il-6*-R | GTGACTCCAGCTTATCTCTTGGT |
| *Tnf-α* | *Tnf-α-*F | ACTGAACTTCGGGGTGATCG | NM\_001278601.1 |
| *Tnf-α*-R | TGGTGGTTTGTGAGTGTGAGG |
| *Zo-1* | *Zo-1-*F | GCCGCTAAGAGCACAGCAA | XM\_036152895.1 |
| *Zo-1*-R | TCCCCACTCTGAAAATGAGGA |
| *Claudin-1* | *Claudin-1-*F | GGGGACAACATCGTGACCG | NM\_016674.4 |
| *Claudin-1*-R | AGGAGTCGAAGACTTTGCACT |
| *Occludin* | *Occludin-*F | TGAAAGTCCACCTCCTTACAGA | NM\_001360538.1 |
| *Occludin*-R | CCGGATAAAAAGAGTACGCTGG |
| *Tlr2* | *Tlr2*-F | ACCCGCCCTTTAAGCTGTGT | NM\_011905.3 |
| *Tlr2*-R | TCGTACTTGCACCACTCGCT |
| *Tlr4* | *Tlr4-*F | TCTGGGGAGGCACATCTTCT | NM\_021297.3 |
| *Tlr4*-R | AGGTCCAAGTTGCCGTTTCT |
| *Myd88* | *Myd88*-F | ACTGGCCTGAGCAACTAGGA | NM\_010851.3 |
| *Myd88-*R | CGTGCCACTACCTGTAGCAA |
| *Nf-κb p65* | *Nf-κb p65*-F | GAGGCACGAGGCTCCTTTTCT | XM\_006531695.3 |
| *Nf-κb p65*-R | GTAGCTGCATGGAGACTCGAACA |
| *Gaphd* | *Gaphd*-F | AGGTCGGTGTGAACGGATTTG | NM\_001289726.1 |
| *Gaphd* -R | TGTAGACCATGTAGTTGAGGTCA |

Figure S1: Representative western blots of Per2 and Gapdh protein in KO and CON mice under NLD and SL.



Figure S2: The prediction of the KEGG primary pathway *via* PICRUSt2 in KO and CON mice under NLD and SL.

