Supplementary Material

Supplementary Table 1. Overall sample information and patients’ characteristics.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Type | gender | age | Mayo endoscopy score | Mayo score | Medication | distribution of  disease1 | disease duration |
| 1 | UC | F | 53 | 3 | 12 | 5-ASA, steroids | E3 | 1 year |
| 2 | UC | M | 29 | 3 | 7 | 5-ASA, steroids | E2 | 5 mouths |
| 3 | UC | M | 40 | 3 | 11 | 5-ASA, steroids | E2 | 4 mouths |
| 4 | UC | M | 54 | 2 | 6 | 5-ASA | E2 | 3 years |
| 5 | UC | F | 52 | 1 | 6 | no treatment | E2 | 1 year |
| 6 | UC | F | 53 | 1 | 5 | no treatment | E1 | 1 year |
| 7 | UC | F | 42 | 2 | 8 | 5-ASA, Azathioprine | E2 | 8 mouths |
| 8 | UC | M | 53 | 2 | 8 | 5-ASA | E3 | 2 years |
| 9 | UC | F | 65 | 2 | 7 | 5-ASA | E2 | 15 years |
| 10 | UC | F | 54 | 3 | 10 | no treatment | E2 | 1.5 years |
| 11 | UC | F | 28 | 3 | 12 | 5-ASA | E2 | 2 years |
| 12 | UC | M | 20 | 1 | 6 | 5-ASA, steroids | E1 | 1 year |
| 13 | UC | M | 32 | 3 | 8 | 5-ASA | E2 | 7 mouths |
| 14 | UC | M | 59 | 2 | 6 | 5-ASA | E1 | 1 year |
| 15 | UC | F | 47 | 2 | 8 | 5-ASA, steroids | E2 | 1 year |
| 16 | UC | M | 49 | 3 | 8 | 5-ASA | E3 | 2 years |
| 17 | UC | M | 31 | 2 | 11 | no treatment | E2 | 1 mouth |
| 18 | UC | F | 53 | 3 | 12 | 5-ASA, steroids | E3 | 1 year |
| 19 | UC | F | 56 | 2 | 6 | 5-ASA, steroids | E3 | 5 years |
| 20 | UC | M | 27 | 2 | 6 | no treatment | E3 | 2 years |
| 21 | UC | F | 46 | 1 | 4 | 5-ASA | E1 | 8 years |
| 22 | UC | F | 65 | 1 | 5 | 5-ASA, steroids, Sulfasalazine | E2 | 2 weeks |
| 23 | UC | M | 29 | 3 | 12 | 5-ASA, steroids, Azathioprine | E3 | 1 year |
| 24 | UC | F | 49 | 2 | 12 | 5-ASA, steroids | E3 | 6 years |
| 25 | UC | M | 48 | 2 | 7 | 5-ASA | E3 | 8 mouths |
| 26 | UC | F | 51 | 2 | 6 | 5-ASA, steroids, Azathioprine | E2 | 1 year |
| 27 | UC | F | 27 | 2 | 6 | Sulfasalazine | E2 | 5 mouths |
| 28 | UC | F | 53 | 1 | 5 | no treatment | E1 | 2 years |
| 29 | UC | M | 49 | 2 | 8 | 5-ASA | E2 | 2 weeks |
| 30 | UC | M | 49 | 2 | 7 | 5-ASA | E2 | 3 years |
| 31 | HC | M | 53 |  |  |  |  |  |
| 32 | HC | F | 60 |  |  |  |  |  |
| 33 | HC | M | 27 |  |  |  |  |  |
| 34 | HC | F | 56 |  |  |  |  |  |
| 35 | HC | M | 33 |  |  |  |  |  |
| 36 | HC | F | 63 |  |  |  |  |  |
| 37 | HC | F | 51 |  |  |  |  |  |
| 38 | HC | M | 41 |  |  |  |  |  |
| 39 | HC | F | 32 |  |  |  |  |  |
| 40 | HC | F | 56 |  |  |  |  |  |
| 41 | HC | M | 53 |  |  |  |  |  |
| 42 | HC | M | 32 |  |  |  |  |  |
| 43 | HC | M | 42 |  |  |  |  |  |
| 44 | HC | F | 45 |  |  |  |  |  |
| 45 | HC | F | 46 |  |  |  |  |  |
| 46 | HC | F | 50 |  |  |  |  |  |
| 47 | HC | F | 44 |  |  |  |  |  |
| 48 | HC | F | 46 |  |  |  |  |  |
| 49 | HC | F | 53 |  |  |  |  |  |
| 50 | HC | M | 56 |  |  |  |  |  |
| 51 | HC | F | 46 |  |  |  |  |  |
| 52 | HC | F | 46 |  |  |  |  |  |
| 53 | HC | M | 52 |  |  |  |  |  |
| 54 | HC | M | 44 |  |  |  |  |  |
| 55 | HC | F | 52 |  |  |  |  |  |

E1, Rectum; E2, Sigmoid and left colon; E3, Entire colon. UC, UC patients; HC, Healthy control; F, female; M, male.

**Supplementary Table 2. Primer sequences for qRT-PCR**

|  |  |
| --- | --- |
| Gene | Primer sequence |
| GADPH | F:5’ GTCTCCTCTGACTTCAACAGCG 3’ |
|  | R :5’ ACCACCCTGTTGCTGTAGCCAA 3’ |
| ZO-1 | F:5’ AATCCCTATCACCCAGCGTC 3’ |
|  | R:5’ CCTTCTGCCCCACTTCAGTC 3’ |
| occludin | F:5’ TGCGGCGAGCGGATTG 3’ |
|  | R:5’ TCAGGCCTGTAAGGAGGTGG 3’ |
| CLDN-2 | F:5’ CATCCCAGAGAAATCGCTCCAACTAC 3’ |
|  | R:5’ AGGCTGTAGGAATTGAACTCACTCTTG 3’ |
| Hsa\_circ\_0001021 | F:5’ TTGGCAGAGCAGTTTGTTCTCCTC 3’ |
|  | R:5’ CTCACCGTCAGGGATGGGTCTAC 3’ |
| miR-224-5p | HmiRQP0343 |
| smad4 | F:5’ CCAGCTCTGTTAGCCCCATC 3’ |
|  | R:5’ TACTGGCAGGCTGACTTGTG 3’ |
| hsa\_circ\_0001021 probe | 5’ AATAATTAATTTACACCTGAACTGAAGTGGCTGA 3’ |
| Si-hsa\_circ\_0001021 | 5’ CCACTTCAGTTCAGGTGTA 3’ |
| miR-224-5p mimics | F:5’ UCAAGUACUAGUGGUUCCGUUUAG 3’ |
|  | R:5’ AAACGGAACCACUAGUGAUUGAUU 3’ |
| miR-224-5p inhibitor | 5’ CUAAACGGAACCACUAGUGACUUGA 3’ |

**Supplementary Table 3. Four miRNAs expression level of UC patients and HCs in miRNA sequencing data**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| miRNA name | UC colon mucosa | HCs colon mucosa | | |
| Inflamed UC colon mucosa versus HCs colon mucosa | | |  |  | |
| hsa-miR-224-5p | 16,873 | 6,187 |  |  | |
| hsa-miR-20b-5p | 189 | 105 |  |  | |
| hsa-miR-182-5p | 4,940 | 2,221 |  |  | |
| hsa-miR-450b-5p | 72 | 11 |  |  | |
| Non-inflamed UC colon mucosa versus HCs colon mucosa | | | | | |
| hsa-miR-224-5p | 9,912 | 6,187 |  |  | |
| hsa-miR-20b-5p | 189 | 105 |  |  | |
| hsa-miR-182-5p | 3,540 | 2,221 |  |  | |
| hsa-miR-450b-5p | 53 | 11 |  |  | |

**Supplementary Figure 1 Correlation analysis of test samples.**

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1. CircRNAs data correlation analysis of test samples. (B) MiRNAs data correlation analysis of test samples. (C) MRNAs data correlation analysis of test samples.

**Supplementary Figure 2 Comparative analysis of hsa\_circ\_0001021 from UC patients treated with or without medicine.**



1. Comparative analysis of hsa\_circ\_0001021 from UC patients treated with or without 5-ASA. (B) Comparative analysis of hsa\_circ\_0001021 from UC patients treated with or without steroids. NS, nonsignificant.