Supplementary Table 1. Gut microbial group specific primers and genomic DNA standards for qPCR

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| Microbial Group | Primer Sequence, 5’-3’  (Forward, F and Reverse, R) | Genomic DNA Standard | Reference |
| Total bacteria | F: ACTCCTACGGGAGGCAGC  R: CCGTMTTACCGCGGCTGCTGGCA | Escherichia coli | Amann, Krumholz, & Stahl, 1990; W.T. Liu, Mirzabekov, & Stahl, 2001 |
| Firmicutes  Clostridium coccoides (cluster XIV)  Clostridium leptum (cluster IV)  Clostridium group (cluster I)  Clostridium group (cluster XI)  Lactobacillus  Roseburia | F: ACTCCTACGGGAGGCAGC  R: GCTTCTTAGTCARGTACCG  F: GCACAAGCAGTGGAGT  R: CTTCCTCCGTTTGTCAA  F: ATGCAAGTCGAGCGAKG  R: TATGCGGTATTAATCTYCCTTT  F: ACGCTACTTGAGGAGGA  R: GAGCCGTAGCCTTTCACT  F: GAGGCAGCAGTAGGGAATCTTC  R: GGCCAGTTACTACCTCTATCCTTCTTC  F: TACTGCATTGGAAACTGTCG  R: CGGCACCGAAGAGCAAT | Ruminococcus productus  Clostridium leptum  Clostridium perfringens  Clostridium difficile  Lactobacillus jensonii  Roseburia hominis | Amann, Krumholz, & Stahl, 1990; Franks et al., 1998  Matsuki, Watanabe, Fujimoto, Takada, & Tanaka, 2004  Rinttila, Kassinen, Malinen, Krogius, & Palva, 2004  Song, Liu, & Finegold, 2004  Delroisse et al., 2008  Larsen et al., 2010 |
| Bacteroidetes  Bacteroides/Prevotella | F: TCCTACGGGAGGCAGCAGT  R: CAATCGGAGTTCTTCGTG | Bacteroides thetaiotaomicron | Bernhard & Field, 2000; Nadkarni, Martin, Jacques, & Hunter, 2002 |
| Actinobacteria  Bifidobacterium | F: CGCGTCYGGTGTGAAAG  R: CCCCACATCCAGCATCCA | Bifidobacterium adolescentis | Delroisse et al., 2008 |
| Archaea  Methanobrevibacter | F: CTCACCGTCAGAATCGTTCCAGTC  R: ACTTGAGATCGGGAGAGGTTAGAGG | Methanobrevibacter smithii | Bomhof et al., 2014 |
| Proteobacteria  Enterobacteriaceae | F: CATTGACGTTACCCGCAGAAGC  R: CTCTACGAGACTCAAGCTTGC | Escherichia coli | Bartosch, Fite,  Macfarlane, & McMurdo, 2004 |
| Verrucomicrobia  Akkermansia muciniphila | F: TCTTCGGAGGCGTTACACAG  R: AGTTGATCTGGGCAGTCTCG | Akkermansia muciniphila | Beacon Designer 3.0 |

Supplementary Table 2: Comparison of 16S rRNA copy number of fecal microbiota between diet-induced obese (DIO) and chow-fed control animals, and obesity prone (DIO-P) and obesity resistant animals (DIO-R). \* indicates p<0.05. Data are presented as mean (95% Confidence Interval).

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | DIO  n=14 | CHOW  n=6 | p-value by diet | DIO-P  n=7 | DIO-R  N=7 | p-value by response | Pearson R with  Mankin Score |
| Microbial Group | Mean (CI) | Mean (CI) |  | Mean (CI) | Mean (CI) |  |  |
| Total | 86086366 (70452295-101720436) | 90053316 (47986287-132120345) | .726 | 97853991(70061816 – 125646165) | 75789695± (55999562-95579828) | .203 | -0.05 |
| *Bacteroides/*  *Prevotella* spp. | 2654977 (2031433-3278521) | 4306664 (2559205-6054121) | .016\* | 2309375 (2614721-3485182) | 3049952(1111411-3507339) | .487 | -0.30 |
| C. cluster XI | 1239372 (759307-1719436 | 14854 (767-28939) | .000\* | 727653 (967450-2680936) | 1824194 (430732-1024575) | .021\* | 0.14 |
| C. cluster I | 119017 (68778-169256) | 10850 (5034-16665) | .002\* | 113288 (55242-195886) | 125565 (23931-202645) | .643 | 0.06 |
| *C. coccoides* | 23369270 (17925058-28813431) | 17971000 (9286190-26655810) | .276 | 20735222 (18861874-33897347) | 26379610 (11589710-29880734) | .298 | 0.36 |
| *C. leptum* | 7690476 (4585621-10795331) | 9544484 (2662627-16426340) | .414 | 6005463 (4371024-14861387) | 9616205 (1554435-10456490) | .165 | 0.012 |
| *Lactobacillus* spp. | 238405 (106301-370508) | 5740715 (2907459-8573969) | .001\* | 266812 (-365-412245) | 205940 (46978-486707) | .817 | -0.45\*  p=0.042 |
| *Roseburia* spp. | 170149 (79021-261276) | 10219 (-537-20975) | .002\* | 91295 (77225-443310) | 260267 (30123-152468) | .028\* | 0.10 |
| *Bifidobacterium* spp. | 195307 (-17636-408250) | 42216 (9844-74587) | .586 | 266703 (0-287169) | 113711 (-153880-687285) | .908 | -0.01 |
| Enterobacteriaceae | 71232 (36613-105850) | 88685 (-44234-181794) | .938 | 57641 (31300 – 142229) | 86765 (2944-112339) | .27 | 0.37 |
| *Methanobrevibacter* spp. | 3803 (3077-4528) | 3498 (2320-4675) | .311 | 3569 (2962-5179) | 4070 (2366-4771) | .325 | 0.51\*  p=0.019 |
| *A.muciniphila* | 187524(36043-333004) | 14527 (3356-25698) | .350 | 144501 (-1802-475190) | 236694 (103662-392663) | .355 | 0.31 |
| Firmicutes | 32826690 (25322936-40330443) | 33292122 (18793304-47790939) | .815 | 27939734 (29482152-47341411) | 38411782 (15293619-40585849) | .105 | 0.18 |
| Ratio  Firmicutes:Bacteroidetes | 7 (5-10) | 4 (3-5) | .011\* | 6 (5-8) | 8 (4-14) | .230 | 0.22 |