

Supplementary Table 1. Genera that differed significantly between *Muc2*^{-/-} and ^{+/+} mice

Time	Phylum	Genus	Relative abundance (%)		p-value	Directions of change	
			<i>Muc2</i> ^{+/+}	<i>Muc2</i> ^{-/-}			
Day 48	Bacteroidetes	<i>Odoribacter</i>	1.24 ± 0.57	0.041 ± 0.014	0.02175	↓	
	Firmicutes	<i>Turicibacter</i>	0.0038 ± 0.00065	0.12 ± 0.052	0.01769	↑	
	Firmicutes	[<i>Eubacterium</i>] <i>brachy</i> group	0.011 ± 0.0076	0.045 ± 0.0086	0.007038	↑	
	Firmicutes	Family XIII AD3011 group	0.0012 ± 0.0021	0.046 ± 0.026	0.04113	↑	
	Proteobacteria	<i>Desulfovibrio</i>	0.00047 ± 0.00035	0.0080 ± 0.0019	0.03126	↑	
	Proteobacteria	<i>Escherichia</i>	0.010 ± 0.0061	0	0.001869	↓	
Day 98	Firmicutes	<i>Ruminococcaceae</i> UCG-014	0.6141 ± 0.42	4.75 ± 0.86	0.001718	↓	
	Firmicutes	uncultured_f_Ruminococcaceae	1.38 ± 0.20	0.59 ± 0.13	0.004471	↓	
	Proteobacteria	<i>Parasutterella</i>	0.57 ± 0.15	0.060 ± 0.029	0.004093	↓	
	Firmicutes	<i>Ruminococcaceae</i> UCG-013	0.40 ± 0.16	0.080 ± 0.048	0.03257	↓	
	Firmicutes	norank_f_Clostridiales_vadin BB60 group	0.28 ± 0.12	0.045 ± 0.028	0.02807	↓	
	Firmicutes	<i>Lachnospiraceae</i> UCG-008	0.0089 ± 0.0043	0	0.02312	↓	
	Firmicutes	<i>Butyrivibrio</i>	0.0013 ± 0.00026	1.23 ± 0.46	0.01017	↑	
	Firmicutes	<i>Blautia</i>	0.015 ± 0.011	1.02 ± 0.55	0.03343	↑	
	Firmicutes	<i>Lachnospiraceae</i> UCG-008	0.31 ± 0.022	0.63 ± 0.17	0.03047	↑	
	Firmicutes	<i>Romboutsia</i>	0.0063 ± 0.0043	0.87 ± 0.46	0.03042	↑	
	Bacteroidetes	<i>Parabacteroides</i>	0.15 ± 0.096	0.50 ± 0.16	0.0319	↑	
	Firmicutes	<i>Lachnospiraceae</i> UCG-010	0	0.65 ± 0.18	0.003141	↑	
	Firmicutes	<i>Clostridium sensu stricto 1</i>	0	0.50 ± 0.28	0.03646	↑	
	Proteobacteria	<i>Sutterella</i>	0.094 ± 0.067	0.38 ± 0.15	0.03902	↑	
	Firmicutes	Family XIII AD3011 group	0.0064 ± 0.0058	0.21 ± 0.076	0.01006	↑	
	Cyanobacteria	norank_o_Gastranaerophilales	0.020 ± 0.017	0.18 ± 0.091	0.04057	↑	
	Firmicutes	<i>Christensenellaceae</i> R-7 group	0.019 ± 0.0073	0.076 ± 0.034	0.04786	↑	
	Firmicutes	[<i>Ruminococcus</i>] <i>gavreaii</i> group	0	0.081 ± 0.032	0.01197	↑	
	Firmicutes	<i>Anaerovorax</i>	0.011 ± 0.0038	0.062 ± 0.022	0.01706	↑	
	Firmicutes	<i>Erysipelotrichaceae</i> UCG-003	0.0013 ± 0.00023	0.043 ± 0.013	0.005516	↑	
	Proteobacteria	<i>Desulfovibrio</i>	0.00012 ± 0.00009	0.013 ± 0.0057	0.006591	↑	
	Firmicutes	<i>Dorea</i>	0.0038 ± 0.0018	0.022 ± 0.006	0.009755	↑	
	Proteobacteria	<i>Escherichia</i>	0.00034 ± 0.00020	0.0015 ± 0.0011	0.03541	↑	
	Firmicutes	<i>Gemella</i>	0	0.0091 ± 0.0011	0.000155	↑	
	Firmicutes	<i>Ruminococcaceae</i> UCG-007	0	0.0062 ± 0.0032	0.02915	↑	
	Firmicutes	<i>Turicibacter</i>	0	0.057 ± 0.0098	0.007134	↑	
	Verucomicrobia	<i>Akkermansia</i>	0	0.00095 ± 0.00037	0.04312	↑	
	Day 118	Bacteroidetes	norank_f_Bacteroidales_S24-7 group	62.85 ± 13.96	35.30 ± 4.45	0.0312	↓
		Proteobacteria	<i>Parasutterella</i>	1.61 ± 0.30	0.056 ± 0.040	0.0008906	↓
		Firmicutes	norank_f_Clostridiales_vadin BB60 group	0.22 ± 0.058	0.059 ± 0.0076	0.009176	↓
Actinobacteria		<i>Coriobacteriaceae</i> UCG-002	0.089 ± 0.029	0.0027 ± 0.0047	0.007522	↓	
Tenericutes		<i>Ureaplasma</i>	0.0083 ± 0.0040	0	0.02443	↓	
Proteobacteria		<i>Desulfovibrio</i>	0.0071 ± 0.0033	0.015 ± 0.0021	0.007534	↑	
Firmicutes		<i>Ruminococcaceae</i> UCG-014	0.51 ± 0.099	6.37 ± 0.98	0.001385	↑	
Firmicutes		Unclassified_f_Lachnospiraceae	2.20 ± 1.80	8.51 ± 1.64	0.01096	↑	
Firmicutes		[<i>Eubacterium</i>] <i>coprostanoligenes</i> group	0.020 ± 0.0030	3.64 ± 1.09	0.004533	↑	
Firmicutes		<i>Ruminococcus 1</i>	0.010 ± 0.0071	2.98 ± 1.47	0.02493	↑	
Bacteroidetes		<i>Alloprevotella</i>	0.066 ± 0.0068	1.36 ± 0.22	0.0006536	↑	
Firmicutes		<i>Anaerotruncus</i>	0.13 ± 0.060	0.83 ± 0.22	0.005963	↑	
Bacteroidetes		<i>Parabacteroides</i>	0.11 ± 0.033	0.60 ± 0.29	0.04347	↑	
Firmicutes		<i>Blautia</i>	0.050 ± 0.044	0.51 ± 0.25	0.03642	↑	

	Firmicutes	<i>[Eubacterium] nodatum group</i>	0.085 ± 0.079	0.37 ± 0.093	0.0151	↑
	Firmicutes	<i>Lachnospiraceae UCG-010</i>	0	0.38 ± 0.15	0.01046	↑
	Firmicutes	<i>[Eubacterium] brachy group</i>	0.036 ± 0.013	0.11 ± 0.034	0.02611	↑
	Proteobacteria	<i>Escherichia</i>	0.00014 ± 0.000098	0.0018 ± 0.00079	0.04519	↑
	Firmicutes	<i>Ruminococcus 2</i>	0	0.063 ± 0.08	0.04799	↑
	Firmicutes	<i>Dorea</i>	0	0.038 ± 0.013	0.008115	↑
	Firmicutes	<i>Gemella</i>	0	0.020 ± 0.0097	0.02624	↑
	Firmicutes	<i>Holdemania</i>	0	0.014 ± 0.0044	0.005278	↑
	Firmicutes	<i>Turicibacter</i>	0	0.078 ± 0.053	0.001348	↑
	Verucomicrobia	<i>Akkermansia</i>	0	0.0052 ± 0.00013	0.008796	↑
Day 138	Firmicutes	<i>uncultured_f_Ruminococcaceae</i>	0.74 ± .055	0.37 ± 0.14	0.01395	↓
	Bacteroidetes	<i>Odoribacter</i>	0.89 ± 0.39	0.12 ± 0.063	0.02787	↓
	Firmicutes	<i>norank_f_Clostridiales_vadin BB60 group</i>	0.34 ± 0.16	0.049 ± 0.019	0.0372	↓
	Firmicutes	<i>Lactococcus</i>	0.27 ± 0.14	0.020 ± 0.016	0.04156	↓
	Bacteroidetes	<i>Bacteroides</i>	2.09 ± 1.01	8.37 ± 1.98	0.02891	↑
	Firmicutes	<i>Ruminococcaceae UCG-014</i>	0.35 ± 0.075	3.81 ± 0.69	0.009553	↑
	Firmicutes	<i>Marvinbryantia</i>	0.27 ± 0.033	4.58 ± 0.79	0.003267	↑
	Proteobacteria	<i>Desulfovibrio</i>	0.0084 ± 0.0036	0.014 ± 0.0025	0.006249	↑
	Firmicutes	<i>Butyricimonas</i>	0	0.045 ± 0.019	0.01423	↑
	Verucomicrobia	<i>Akkermansia</i>	0	0.0035 ± 0.00039	0.03547	↑
Firmicutes	<i>Turicibacter</i>	0	0.0066 ± 0.0034	0.02583	↑	
Day 178	Proteobacteria	<i>Parasutterella</i>	1.78 ± 0.86	0.13 ± 0.088	0.02929	↓
	Bacteroidetes	<i>Odoribacter</i>	0.56 ± 0.23	0.078 ± 0.043	0.02335	↓
	Bacteroidetes	<i>Unclassified o_Bacteroidales</i>	0.48 ± 0.19	0.12 ± 0.047	0.0359	↓
	Firmicutes	<i>Bacillus</i>	0.059 ± 0.021	0.0084 ± 0.0034	0.01566	↓
	Proteobacteria	<i>Pseudomonas</i>	0.022 ± 0.0034	0.0027 ± 0.0046	0.004288	↓
	Firmicutes	<i>Carnobacterium</i>	0.016 ± 0.0081	0	0.02795	↓
	Firmicutes	<i>Exiguobacterium</i>	0.0079 ± 0.0046	0	0.04054	↓
	Firmicutes	<i>Ruminococcaceae UCG-014</i>	0.83 ± 0.12	7.56 ± 1.51	0.008431	↑
	Firmicutes	<i>Butyrivibrio</i>	0.0091 ± 0.0059	4.32 ± 1.32	0.004812	↑
	Proteobacteria	<i>Desulfovibrio</i>	0.0067 ± 0.0021	0.011 ± 0.00081	0.001538	↑
	Firmicutes	<i>Quinella</i>	0.58 ± 0.054	2.01 ± 0.50	0.02788	↑
	Firmicutes	<i>Turicibacter</i>	0.0050 ± 0.0017	1.99 ± 0.50	0.002382	↑
	Cyanobacteria	<i>Microcystis</i>	0	0.51 ± 0.16	0.00506	↑
	Cyanobacteria	<i>norank_o_Gastranaerophilales</i>	0.029 ± 0.023	0.17 ± 0.071	0.02992	↑
	Firmicutes	<i>Anaerovorax</i>	0.0084 ± 0.011	0.13 ± 0.058	0.02597	↑
	Actinobacteria	<i>Gordonibacter</i>	0.016 ± 0.010	0.083 ± 0.038	0.03959	↑
	Firmicutes	<i>Family XIII AD3011 group</i>	0.013 ± 0.014	0.079 ± 0.011	0.00317	↑
	Proteobacteria	<i>Porphyrobacter</i>	0	0.052 ± 0.014	0.003051	↑
	Bacteroidetes	<i>Unclassified p_Bacteroidetes</i>	0	0.034 ± 0.014	0.01311	↑
	Firmicutes	<i>Unclassified_f_Erysipelotrichaceae</i>	0.0027 ± 0.0024	0.018 ± 0.0070	0.02345	↑
	Proteobacteria	<i>Bilophila</i>	0.0027 ± 0.0024	0.010 ± 0.0021	0.01501	↑
	Verucomicrobia	<i>Akkermansia</i>	0	0.00095 ± 0.00011	0.03528	↑
	Firmicutes	<i>Turicibacter</i>	0	0.020 ± 0.0093	0.02583	↑