

Figure S1: Individual values of phage K1_ULINTec4 concentrations measured. PC: proximal colon, DC: distal colon, 1: system 1 (phage alone), 3: system 3 (bacteria+phage). The dotted line represents the limit of quantification.

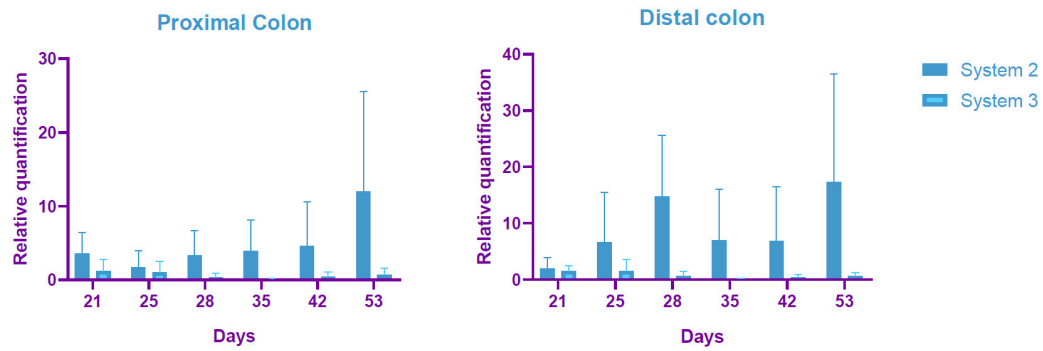


Figure S2: Comparisons of relative quantifications of *E. coli* K1 between systems 2 and 3. Data presented were calculated using $2^{-\Delta\Delta Cq}$ method. PC: proximal colon, DC: distal colon. The replicates represent the mean results of the three separate donors with SD. No statistically significant difference was highlighted.

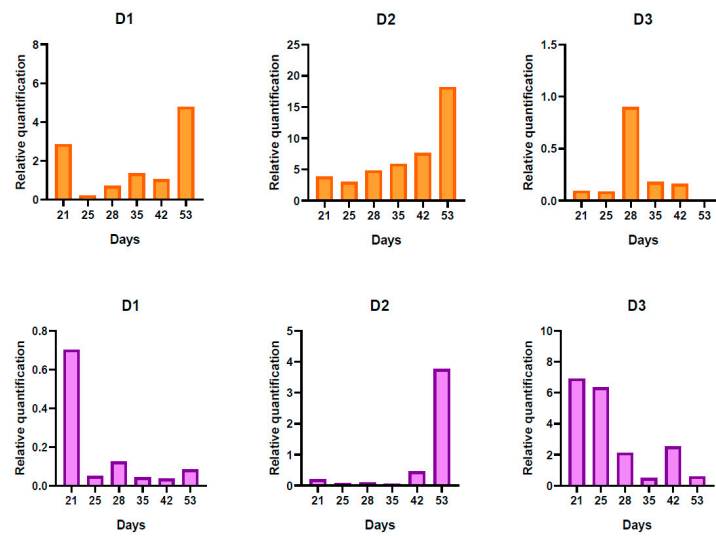


Figure S3: Individual values of relative quantifications of *E. coli* K1 in proximal colons. Orange: system 2, Purple: system 3. Data presented were calculated using $2^{-\Delta\Delta Cq}$ method. D1: donor 1, D2: donor 2, D3: donor 3

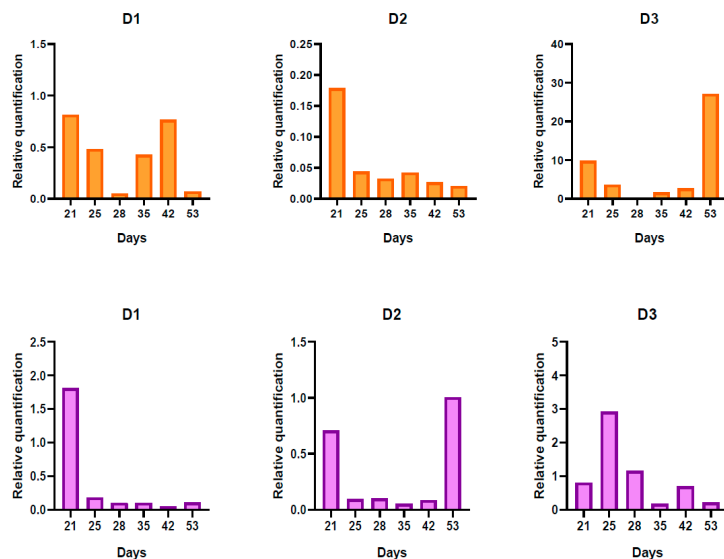


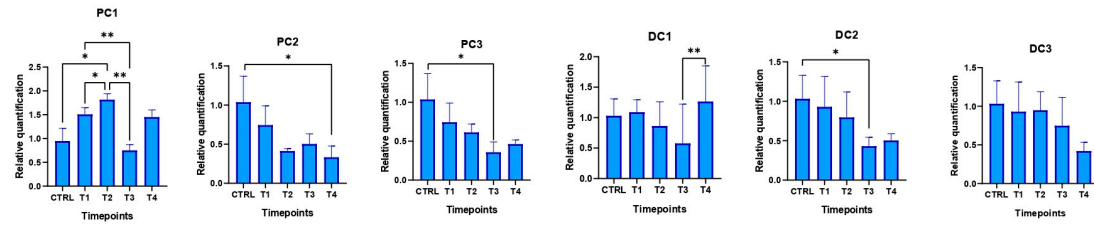
Figure S4: Individual values of relative quantifications of *E. coli* K1 in distal colons. Orange: system 2, Purple: system 3. Data presented were calculated using $2^{-\Delta\Delta Cq}$ method. D1: donor 1, D2: donor 2, D3: donor 3

Table S1. Evolution of Shannon, Simpson and Piélou alpha diversity indexes in proximal and distal colons of the three systems. Results of the three donors are presented as mean \pm SD.

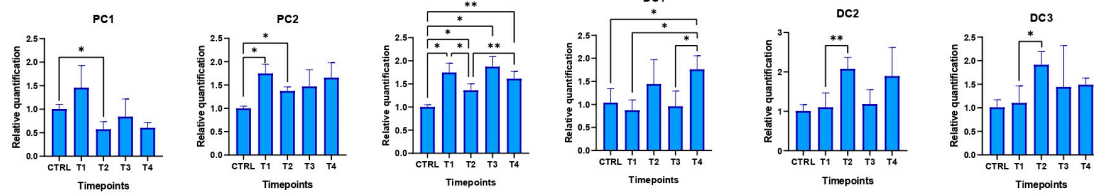
		Days							
		14	21	25	28	35	42	49	53
PC1	Shannon	1.26 \pm 0.08	1.39 \pm 0.14	1.21 \pm 0.26	1.18 \pm 0.31	1.41 \pm 0.02	1.36 \pm 0.04	1.41 \pm 0.17	1.54 \pm 0.2
	Simpson	0.55 \pm 0.08	0.62 \pm 0.14	0.54 \pm 0.18	0.55 \pm 0.22	0.62 \pm 0.07	0.58 \pm 0.06	0.6 \pm 0.12	0.63 \pm 0.03
	Piélou	0.44 \pm 0.08	0.5 \pm 0.13	0.43 \pm 0.14	0.42 \pm 0.15	0.48 \pm 0.09	0.49 \pm 0.05	0.48 \pm 0.1	0.52 \pm 0.02
PC2	Shannon	1.37 \pm 0.38	1.39 \pm 0.02	1.49 \pm 0.27	1.47 \pm 0.26	1.6 \pm 0.12	1.67 \pm 0.23	1.85 \pm 0.2	1.84 \pm 0.21
	Simpson	0.61 \pm 0.11	0.63 \pm 0.07	0.66 \pm 0.11	0.65 \pm 0.12	0.72 \pm 0.04	0.73 \pm 0.06	0.78 \pm 0.02	0.79 \pm 0.02
	Piélou	0.47 \pm 0.1	0.5 \pm 0.1	0.53 \pm 0.11	0.5 \pm 0.09	0.57 \pm 0.05	0.55 \pm 0.05	0.62 \pm 0.02	0.61 \pm 0.02
PC3	Shannon	1.21 \pm 0.19	1.61 \pm 0.22	1.55 \pm 0.06	1.43 \pm 0.16	1.44 \pm 0.32	1.34 \pm 0.42	1.63 \pm 0.41	1.64 \pm 0.32
	Simpson	0.53 \pm 0.14	0.7 \pm 0.03	0.71 \pm 0.04	0.66 \pm 0.1	0.66 \pm 0.13	0.6 \pm 0.21	0.72 \pm 0.12	0.72 \pm 0.12
	Piélou	0.45 \pm 0.15	0.54 \pm 0.05	0.54 \pm 0.08	0.5 \pm 0.15	0.51 \pm 0.14	0.46 \pm 0.17	0.55 \pm 0.13	0.55 \pm 0.13
DC1	Shannon	2.29 \pm 0.77	2.37 \pm 0.55	2.32 \pm 0.7	2.44 \pm 0.64	2.46 \pm 0.41	2.43 \pm 0.68	2.18 \pm 0.82	2.09 \pm 1.03
	Simpson	0.76 \pm 0.17	0.79 \pm 0.12	0.78 \pm 0.18	0.84 \pm 0.09	0.84 \pm 0.04	0.82 \pm 0.11	0.74 \pm 0.19	0.7 \pm 0.28
	Piélou	0.61 \pm 0.11	0.63 \pm 0.1	0.61 \pm 0.14	0.66 \pm 0.09	0.66 \pm 0.04	0.64 \pm 0.08	0.57 \pm 0.13	0.54 \pm 0.2
DC2	Shannon	2.29 \pm 0.44	2.26 \pm 0.35	2.32 \pm 0.22	2.4 \pm 0.22	2.53 \pm 0.39	2.52 \pm 0.47	2.11 \pm 0.57	1.92 \pm 0.55
	Simpson	0.81 \pm 0.06	0.8 \pm 0.1	0.82 \pm 0.06	0.85 \pm 0.03	0.87 \pm 0.03	0.85 \pm 0.06	0.76 \pm 0.14	0.68 \pm 0.17
	Piélou	0.62 \pm 0.08	0.62 \pm 0.13	0.62 \pm 0.07	0.64 \pm 0.07	0.67 \pm 0.03	0.66 \pm 0.04	0.6 \pm 0.1	0.52 \pm 0.14
DC3	Shannon	2.47 \pm 0.59	2.42 \pm 0.28	2.43 \pm 0.16	2.46 \pm 0.29	2.48 \pm 0.28	2.43 \pm 0.6	2.37 \pm 0.56	2.19 \pm 0.47
	Simpson	0.82 \pm 0.1	0.83 \pm 0.04	0.84 \pm 0.01	0.84 \pm 0.03	0.85 \pm 0.03	0.83 \pm 0.11	0.81 \pm 0.08	0.77 \pm 0.09
	Piélou	0.66 \pm 0.07	0.65 \pm 0.02	0.66 \pm 0.05	0.66 \pm 0.06	0.67 \pm 0.05	0.65 \pm 0.11	0.63 \pm 0.08	0.59 \pm 0.06

PC: proximal colon, DC: distal colon, 1: system 1, 2: system 2, 3: system 3

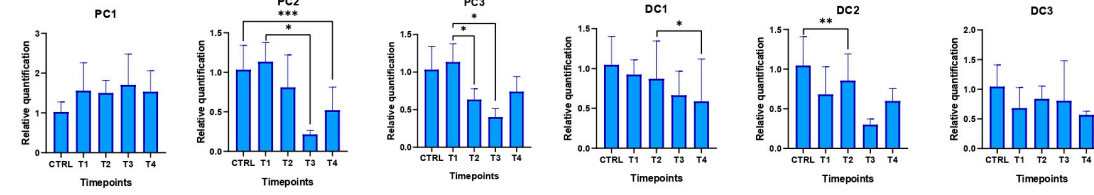
Bacillota



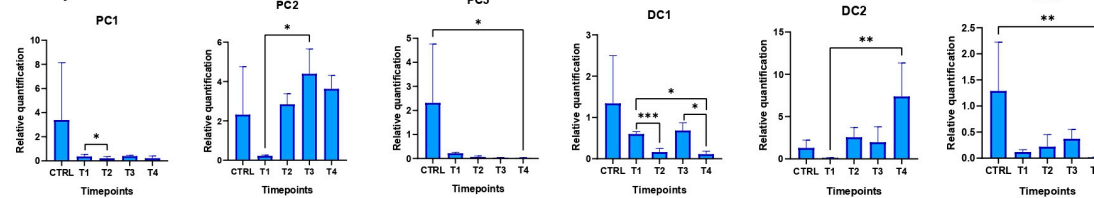
Bacteroidota



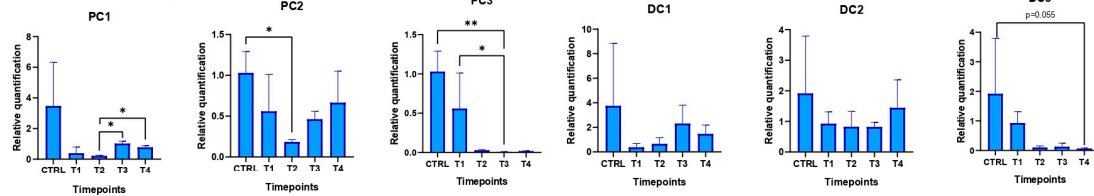
Gammaproteobacteria



Actinomycetes



Escherichia coli/Shigella



Akkermansia

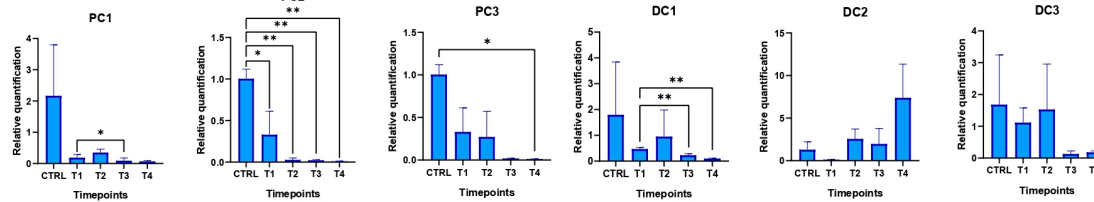


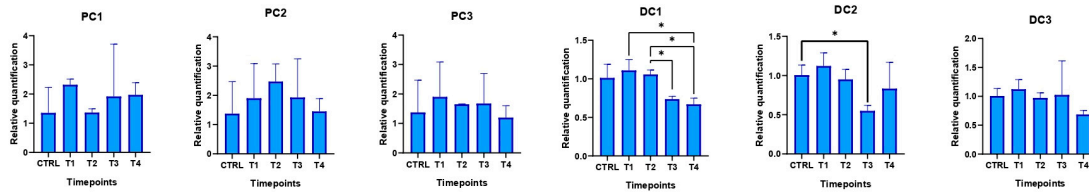
Figure S5 : Relative quantification of taxa assessed by qPCR from donor 1. Data presented were calculated using $2^{-\Delta\Delta C_q}$ method. PC: proximal colon, DC: distal colon, 1: system 1, 2: system 2, 3: system 3. Statistical significance is indicated as p < 0.05 (*), p < 0.01 (**).

Table S2. Summary of qPCR p-values from donor 1

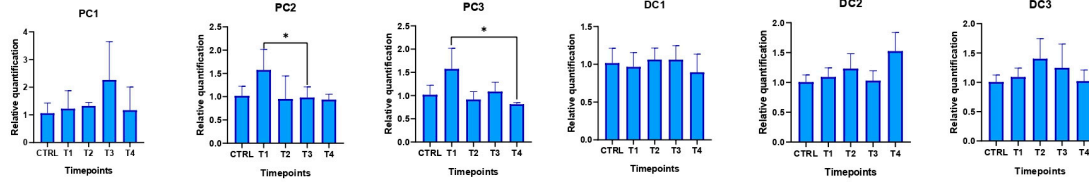
Target	Bioreactor	Timepoints	p-value
<i>Bacillota</i>	PC1	CTRL-T2	0.0455
<i>Bacillota</i>	PC1	T1-T2	0.0359
<i>Bacillota</i>	PC1	T2-T3	0.0021
<i>Bacillota</i>	PC1	T1-T3	0.0022
<i>Bacillota</i>	DC1	T3-T4	0.0092
<i>Bacillota</i>	PC2	CTRL-T4	0.0365
<i>Bacillota</i>	PC3	CTRL-T3	0.0175
<i>Bacillota</i>	DC2	CTRL-T3	0.0175
<i>Bacteroidota</i>	PC1	CTRL-T2	0.0373
<i>Bacteroidota</i>	PC2	CTRL-T1	0.0140
<i>Bacteroidota</i>	PC2	CTRL-T2	0.0145
<i>Bacteroidota</i>	PC3	CTRL-T1	0.014
<i>Bacteroidota</i>	PC3	CTRL-T2	0.0248
<i>Bacteroidota</i>	PC3	CTRL-T3	0.0154
<i>Bacteroidota</i>	PC3	CTRL-T4	0.0096
<i>Bacteroidota</i>	PC3	T1-T2	0.0457
<i>Bacteroidota</i>	PC3	T2-T4	0.0088
<i>Bacteroidota</i>	DC1	CTRL-T4	0.0137
<i>Bacteroidota</i>	DC1	T1-T4	0.0107
<i>Bacteroidota</i>	DC1	T3-T4	0.0143
<i>Bacteroidota</i>	DC2	T1-T2	0.0014
<i>Bacteroidota</i>	DC3	T1-T2	0.0450
<i>Gammaproteobacteria</i>	PC2	CTRL-T4	0.0003
<i>Gammaproteobacteria</i>	PC2	T1-T3	0.0306
<i>Gammaproteobacteria</i>	PC3	T1-T2	0.0325
<i>Gammaproteobacteria</i>	PC3	T1-T3	0.0123
<i>Gammaproteobacteria</i>	DC1	T2-T4	0.0284
<i>Gammaproteobacteria</i>	DC2	CTRL-T2	0.0073
<i>Actinomycetes</i>	PC1	T1-T2	0.0148
<i>Actinomycetes</i>	PC2	T1-T3	0.0175
<i>Actinomycetes</i>	PC3	CTRL-T4	0.0365
<i>Actinomycetes</i>	DC1	T1-T2	0.0005
<i>Actinomycetes</i>	DC1	T1-T4	0.0197
<i>Actinomycetes</i>	DC1	T3-T4	0.0136
<i>Actinomycetes</i>	DC2	T1-T4	0.0035
<i>Actinomycetes</i>	DC3	CTRL-T4	0.0175
<i>Escherichia coli/Shigella</i>	PC1	T2-T3	0.0115
<i>Escherichia coli/Shigella</i>	PC1	T2-T4	0.0134
<i>Escherichia coli/Shigella</i>	PC2	CTRL-T2	0.0175
<i>Escherichia coli/Shigella</i>	PC3	CTRL-T3	0.008
<i>Escherichia coli/Shigella</i>	PC3	T1-T3	0.0365
<i>Escherichia coli/Shigella</i>	DC3	CTRL-T4	0.055
<i>Akkermansia</i>	PC1	T1-T3	0.0223
<i>Akkermansia</i>	PC2	CTRL-T1	0.0322
<i>Akkermansia</i>	PC2	CTRL-T2	0.0014
<i>Akkermansia</i>	PC2	CTRL-T3	0.0016
<i>Akkermansia</i>	PC2	CTRL-T4	0.0017
<i>Akkermansia</i>	PC3	CTRL-T4	0.0175
<i>Akkermansia</i>	DC1	T1-T3	0.0063
<i>Akkermansia</i>	DC1	T1-T4	0.0035

PC: proximal colon, DC: distal colon, 1: system 1, 2: system 2, 3: system 3.

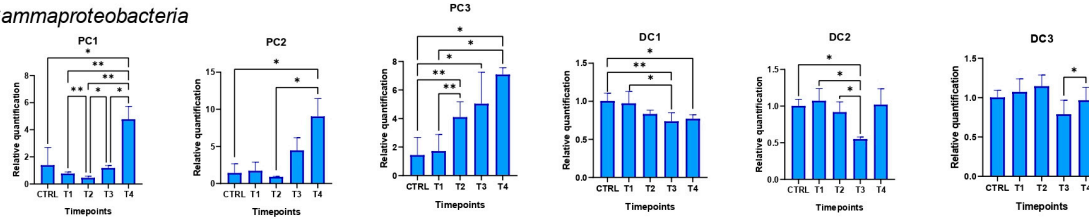
Bacillota



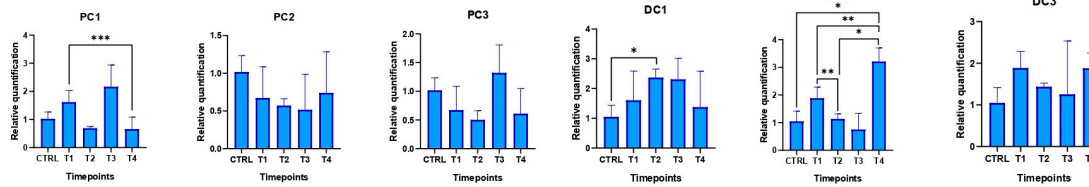
Bacteroidota



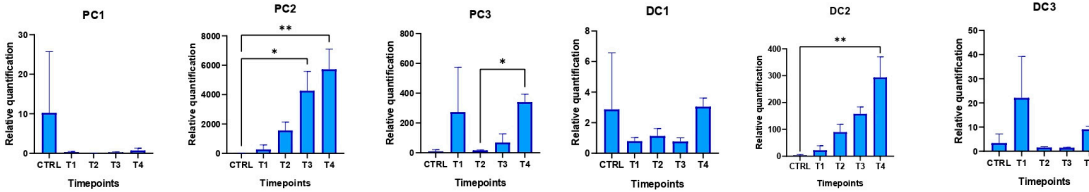
Gammaproteobacteria



Actinomycetes



Escherichia coli/Shigella



Akkermansia

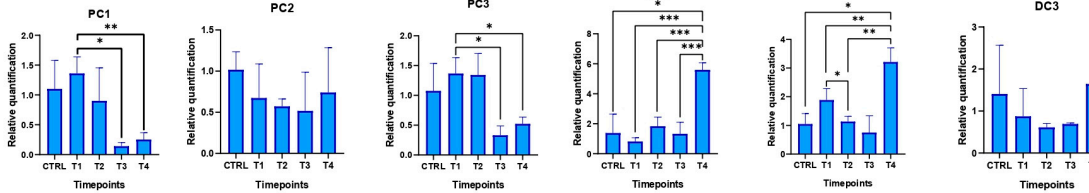


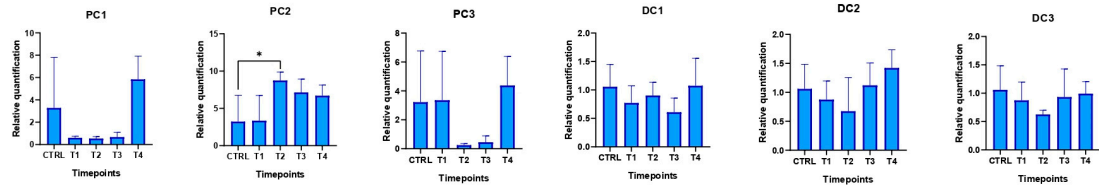
Figure S6 : Relative quantification of taxa assessed by qPCR from donor 2. Data presented were calculated using $2^{-\Delta\Delta C_q}$ method. PC: proximal colon, DC: distal colon, 1: system 1, 2: system 2, 3: system 3. Statistical significance is indicated as $p < 0.05$ (*), $p < 0.01$ (**), $p < 0.001$ (***).

Table S3. Summary of qPCR p-values from donor 2

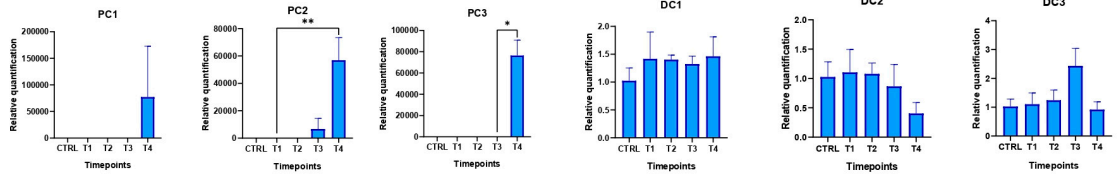
Target	Bioreactor	Timepoints	p-value
<i>Bacillota</i>	PC1	T1-T2	0.0232
<i>Bacillota</i>	DC1	T1-T4	0.0421
<i>Bacillota</i>	DC1	T2-T3	0.016
<i>Bacillota</i>	DC1	T2-T4	0.0289
<i>Bacillota</i>	DC2	CTRL-T3	0.0413
<i>Bacillota</i>	DC3	CTRL-T4	0.0232
<i>Bacillota</i>	DC3	T1-T4	0.0320
<i>Bacteroidota</i>	PC2	T1-T3	0.0492
<i>Bacteroidota</i>	PC3	T1-T4	0.0365
<i>Gammaproteobacteria</i>	PC1	CTRL-T4	0.0489
<i>Gammaproteobacteria</i>	PC1	T1-T2	0.0087
<i>Gammaproteobacteria</i>	PC1	T1-T4	0.0094
<i>Gammaproteobacteria</i>	PC1	T2-T3	0.0409
<i>Gammaproteobacteria</i>	PC1	T2-T4	0.0086
<i>Gammaproteobacteria</i>	PC1	T3-T4	0.0203
<i>Gammaproteobacteria</i>	PC2	CTRL-T4	0.0175
<i>Gammaproteobacteria</i>	PC2	T2-T4	0.0365
<i>Gammaproteobacteria</i>	PC3	CTRL-T2	0.0044
<i>Gammaproteobacteria</i>	PC3	CTRL-T3	0.0395
<i>Gammaproteobacteria</i>	PC3	CTRL-T4	0.0256
<i>Gammaproteobacteria</i>	PC3	T1-T2	0.0017
<i>Gammaproteobacteria</i>	PC3	T1-T4	0.0268
<i>Gammaproteobacteria</i>	DC1	CTRL-T3	0.0033
<i>Gammaproteobacteria</i>	DC1	CTRL-T4	0.0315
<i>Gammaproteobacteria</i>	DC1	T1-T3	0.0283
<i>Gammaproteobacteria</i>	DC2	CTRL-T3	0.0135
<i>Gammaproteobacteria</i>	DC2	T1-T3	0.0359
<i>Gammaproteobacteria</i>	DC2	T2-T3	0.0322
<i>Gammaproteobacteria</i>	DC3	T3-T4	0.0110
<i>Actinomycetes</i>	PC1	T1-T4	<0.0001
<i>Actinomycetes</i>	DC1	CTRL-T2	0.0260
<i>Actinomycetes</i>	DC2	CTRL-T4	0.0465
<i>Actinomycetes</i>	DC2	T1-T2	0.0337
<i>Actinomycetes</i>	DC2	T1-T4	0.0035
<i>Actinomycetes</i>	DC2	T2-T4	0.0044
<i>Escherichia coli/Shigella</i>	PC2	CTRL-T3	0.0365
<i>Escherichia coli/Shigella</i>	PC2	CTRL-T4	0.008
<i>Escherichia coli/Shigella</i>	PC3	T2-T4	0.0365
<i>Escherichia coli/Shigella</i>	DC1	T1-T4	0.0070
<i>Escherichia coli/Shigella</i>	DC1	T3-T4	0.0250
<i>Escherichia coli/Shigella</i>	DC2	CTRL-T4	0.0035
<i>Akkermansia</i>	PC1	T1-T3	0.0214
<i>Akkermansia</i>	PC1	T1-T4	0.0041
<i>Akkermansia</i>	PC3	T1-T3	0.0294
<i>Akkermansia</i>	PC3	T1-T4	0.0094
<i>Akkermansia</i>	DC1	CTRL-T4	0.0123
<i>Akkermansia</i>	DC1	T1-T4	0.0003
<i>Akkermansia</i>	DC1	T2-T4	0.0003
<i>Akkermansia</i>	DC1	T3-T4	0.0005
<i>Akkermansia</i>	DC2	CTRL-T4	0.0465
<i>Akkermansia</i>	DC2	T1-T2	0.0337
<i>Akkermansia</i>	DC2	T1-T4	0.0035
<i>Akkermansia</i>	DC2	T2-T4	0.0044

PC: proximal colon, DC: distal colon, 1: system 1, 2: system 2, 3: system 3.

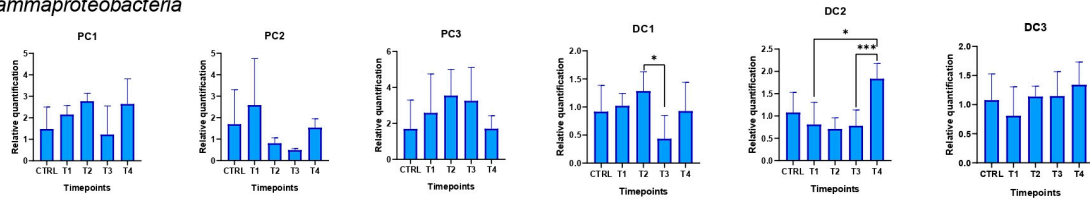
Bacillota



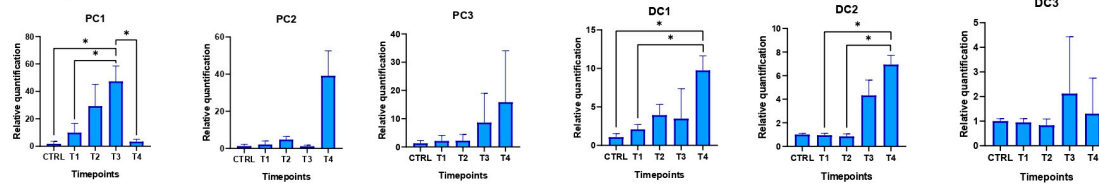
Bacteroidota



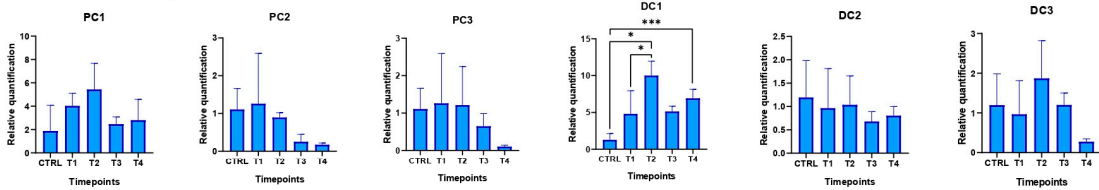
Gammaproteobacteria



Actinomycetes



Escherichia coli/Shigella



Akkermansia

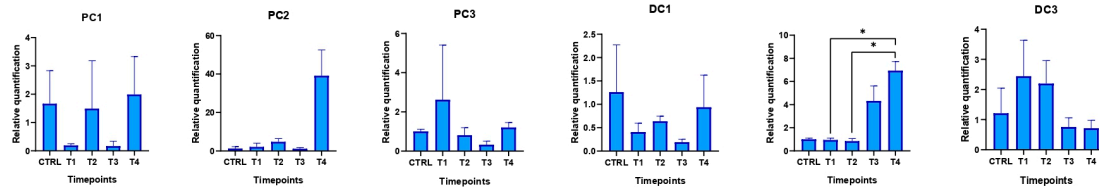


Figure S7 : Relative quantification of taxa assessed by qPCR from donor 3. Data presented were calculated using $2^{-\Delta\Delta C_q}$ method. PC: proximal colon, DC: distal colon, 1: system 1, 2: system 2, 3: system 3. Statistical significance is indicated as $p < 0.05$ (*), $p < 0.01$ (**), $p < 0.001$ (***).

Table S4: Summary of qPCR p-values from donor 3

Target	Bioreactor	Timepoints	p-value
<i>Bacillota</i>	PC1	T1-T4	0.0499
<i>Bacillota</i>	PC2	CTRL-T2	0.017
<i>Bacteroidota</i>	PC2	T1-T4	0.008
<i>Bacteroidota</i>	PC3	T3-T4	0.0175
<i>Gammaproteobacteria</i>	PC1	CTRL-T4	0.0365
<i>Gammaproteobacteria</i>	DC1	T2-T3	0.0187
<i>Gammaproteobacteria</i>	DC2	T1-T4	0.0137
<i>Gammaproteobacteria</i>	DC2	T3-T4	0.001
<i>Actinomycetes</i>	PC1	CTRL-T3	0.0145
<i>Actinomycetes</i>	PC1	T1-T3	0.0264
<i>Actinomycetes</i>	PC1	T3-T4	0.0207
<i>Actinomycetes</i>	DC1	CTRL-T4	0.0107
<i>Actinomycetes</i>	DC1	T1-T4	0.018
<i>Actinomycetes</i>	DC2	T1-T4	0.0365
<i>Actinomycetes</i>	DC2	T2-T4	0.0365
<i>Escherichia coli/Shigella</i>	DC1	CTRL-T2	0.0224
<i>Escherichia coli/Shigella</i>	DC1	CTRL-T4	0.0004
<i>Escherichia coli/Shigella</i>	DC1	T1-T2	0.0466
<i>Akkermansia</i>	DC1	T2-T3	0.0059
<i>Akkermansia</i>	DC2	T1-T4	0.0365
<i>Akkermansia</i>	DC2	T2-T4	0.0365

PC: proximal colon, DC: distal colon, 1: system 1, 2: system 2, 3: system 3.