

**Table S1** Oligonucleotide primers used in this study.

primer	Target	Primer sequence (5' to 3')	Reference
Arch21F	Archaeal 16S rRNA gene	TTC CGG TTG ATC CYG CCG GA	[1]
340F <sup>a</sup>	Archaeal 16S rRNA gene	CCY TAY GRG GYG CAS CAG G	[2]
Ar912r <sup>a</sup>	Archaeal 16S rRNA gene	CCC CCG CCA ATT CCT TTA A	[3, 4]
932R	Archaeal 16S rRNA gene	GCY CYC CCG CCA ATT CMT TTA	[5]
27F	Bacterial 16S rRNA gene	AGA GTT TGA TCM TGG CTC AG	[6]
EUB338F <sup>b</sup>	Bacterial 16S rRNA gene	ACT CCT ACG GGA GGC AGC	[7]
		ACT CCT ACG GGA GGC TGC	[8]
		ACA CCT ACG GGT GGC TGC	[8]
		ACA CCT ACG GGT GGC AGC	[8]
907R <sup>a</sup>	Bacterial 16S rRNA gene	CCG TCA ATT CMT TTR AGT T	[6]
1492R <sup>a</sup>	Archaeal and bacterial 16S rRNA gene	GGH TAC CTT GTT ACG ACT T	[6]
MLf	<i>mcrA</i> gene	GGT GGT GTM GGA TTC ACA CAR TAY GCW ACA GC	[9]
MLr	<i>mcrA</i> gene	TTC ATT GCR TAG TTW GGR TAG TT	[9]

<sup>a</sup>These primers are a slightly modified version of the original designed primers.

<sup>b</sup>This primer consisted of a mixture of four primers at an equal amount (mol).

#### References

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