Table S1. Oligonucleotides (5′⟶3′) used in this study

Primer name	Sequence	Reference
Oligonucleotides (5′⟶3′) used to amplify *etnE* sequences		
CoM-F1L	AACTACCCSAAYCCSCGCTGGTACGAC	(1, 2)
CoM-R2E	GTCGGCAGTTTCGGTGATCGTGCTCTTGAC	(1, 2)
JS623RTAkMOF	TCACTTCTGGCACCAACATC	This study
JS623RTAkMOR	GACGACCCACTCTTCCCATA	This study
JS623WEtnEF	TAGCCTGGCAGCTGGACTAT	This study
JS623WEtnER	CAGTCGCGACATCACAGATT	This study
JS623PMDF	GGCGTTCAAAGAGGACTTCA	This study
JS623PMDR	TTCGGTGATCGTTGATTTGA	This study
Oligonucleotides (5′⟶3′) used for primer walking on fosmid clones		
JS623EtnAF	TTTGGGAACCAATCGAAGAT	This study
JS623EtnBR	AACTGGCATGACTGGAGAGC	This study
JS623EtnDF	CGGATTTAGCGGTGGATGTA	This study
JS6231F	CGTGGACGAAGGAACTGATA	This study
JS6232F	CGTGAACTGGAAAACGAACA	This study
JS6233R	TCGCTGAGTTCGTTCATGTC	This study
JS6234F	ACAGTCTGGCGACACTCAAC	This study
pCC1FOS5F	GGATGTGCTGCAAGGCGATTAAGTTGG	Epicentre
pCC1FOS5R	CTCGTATGTTGTGTGGAATTGTGAGC	Epicentre

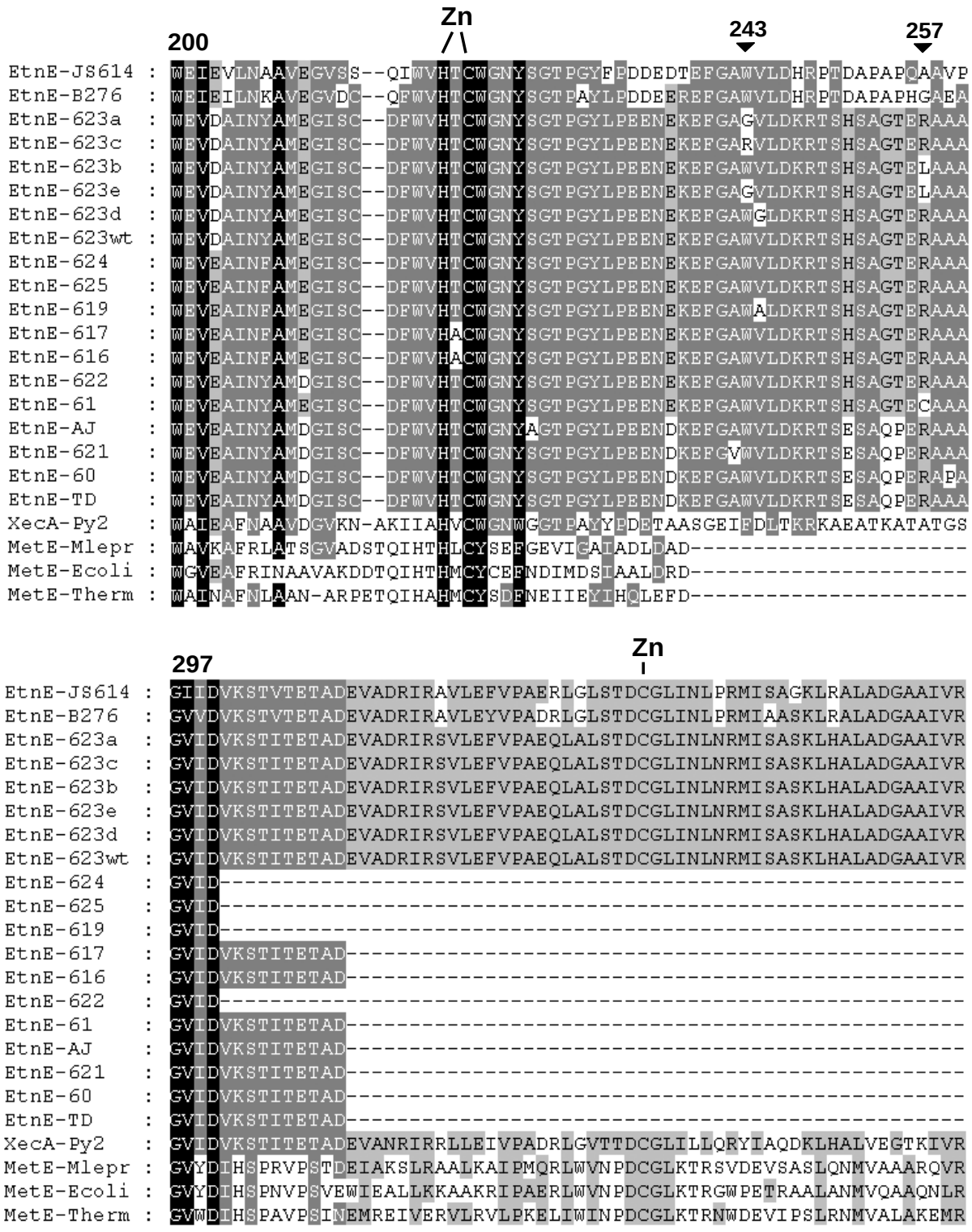

Figure S1. Regions from an alignment of zinc-containing transferases EtnE, XecA, and MetE, numbered according to the JS623 EtnE enzyme. The His-Cys-Cys motif involved in zinc binding corresponds to H219-C221-C337 in JS623. Also indicated are the W243 and R257 residues predicted to be important for VC adaptation in JS623. EtnE, XecA, and MetE sequences are identified according to their source strain (*Nocardioides* JS614, *Gordonia* B-276,

Mycobacterium JS623, JS624, JS625, JS619, JS617, JS616, JS622, JS61, JS621, and JS60, *Pseudomonas* AJ, *Ochrobactrum* TD, *Xanthobacter* Py2, *Mycobacterium leprae* (Mlepr), *E.coli*, and *Thermotoga*). Other abbreviations: wt: wild-type, a-e identify JS623 EtnE variants.

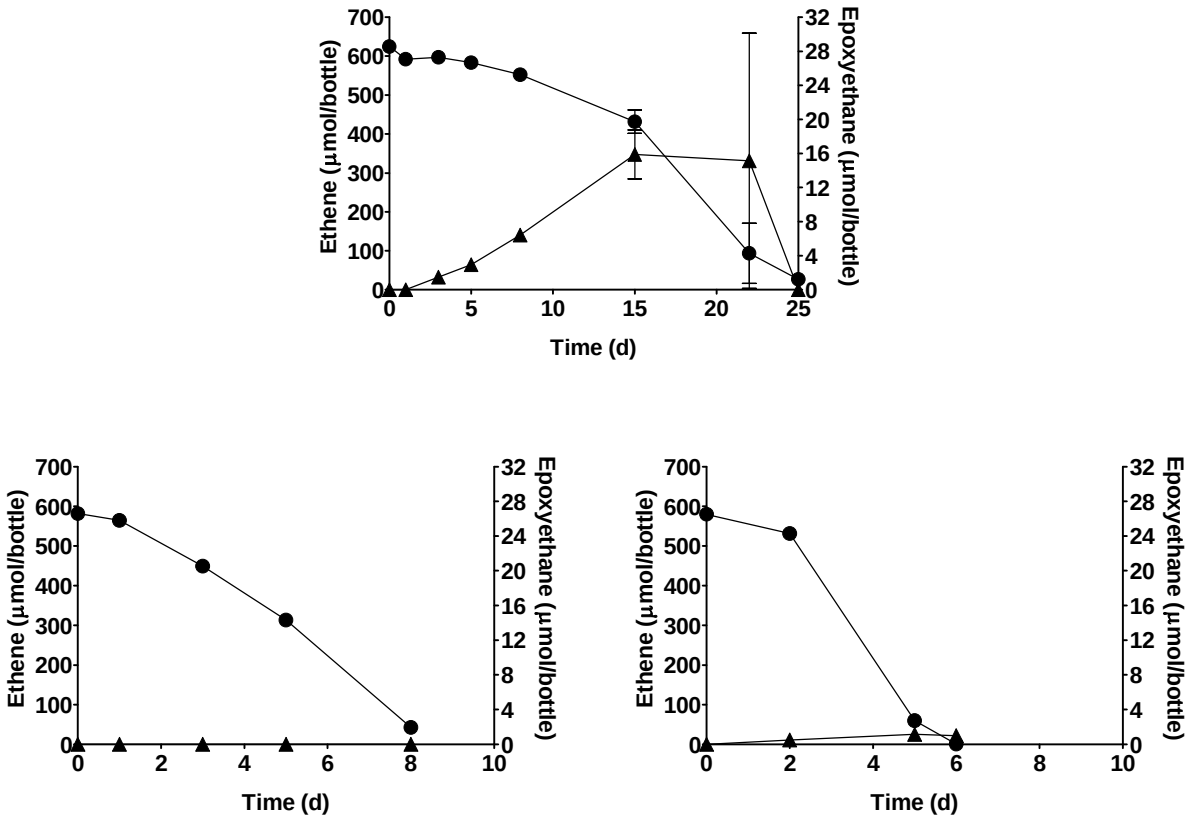

Figure S2: Ethene (●) biodegradation and epoxyethane (▲) accumulation in recombinant JS623 strains A) JS623(pMV*etnE*), B) JS623(pMV*etnE1*), and C) JS623(pMV*etnE2*). The data points are the averages from analysis of three replicate bottles and the error bars are the standard deviation. In some cases, the error bars are smaller than the symbols. The behavior of JS623(pMV*etnE1*) JS623(pMV*etnE2*) cultures was confirmed in at least two independent experiments.

References

1. **Coleman, N. V., and J. C. Spain.** 2003. Distribution of the coenzyme M pathway of epoxide metabolism among ethene- and vinyl chloride-degrading *Mycobacterium* strains. Appl. Environ. Microbiol. **69:**6041-6046.
2. **Mattes, T. E., N. V. Coleman, J. C. Spain, and J. M. Gossett.** 2005. Physiological and molecular genetic analyses of vinyl chloride and ethene biodegradation in *Nocardioides* sp. strain JS614. Arch. Microbiol. **183:**95-106.