

Additional file 2

High yield 1,3-propanediol production by rational engineering of the 3-hydroxypropionaldehyde bottleneck in *Citrobacter werkmanii*

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Sequence data confirming different knock-out strains. Green = sequence of P1 primer; blue = sequence of P2 primer; red = FRT scar; purple = chloramphenicol resistance gene

dhaD: 5'-

GCATAGCCATGACATTAGCTGCCACGCGG**GTGTAGGCTGGAGCTGCTTGAAGTTCCTATACTTTCTAGAGAA**
TAGGAACCTTCGGAATAGGAACT**AAGGAGGATATTCATAT**GGCGGAAATGGGCGTAAAAGATGACATTGATGG
CAAGATCATGGCCGTG-3'

ldhA: 5'-

TCTGCAGCAGGTAAACGAGGCTTTTGG**GTGTAGGCTGGAGCTGCTTGAAGTTCCTATACTTTCTAGAGAATA**
GGAACCTTCGGAATAGGAACT**AAGGAGGATATTCATAT**GCGCCGAAGCGTTGACCAGCATTCTGAAACG-3'

adhE::ChIFRT: 5'-

GGTGTAGGCTGGAGCTGCTTGAAGTTCCTATACTTTCTAGAGAATAGGAACCTTCGGAATAGGAACTTCATTTA
AATGGCGCGCCTTACGCCCCGCCCTGCCACTCATCGCAGTACTGTTGTAATTCATTAAGCATTCTGCCGACATG
GAAGCCATCACAAACGGCATGATGAACCTGAATCGCCAGCGGCATCAGCACCTTGTCGCCTTGCGTATAATAT
TTGCCATGGTGAAAACGGGGCGAAGAAGTTGTCCATATTGGCCACGTTTAAATCAAACTGGTGAACTCA
CCCAGGGATTGGCTGAGACGAAAAACATATTCTCAATAAACCCTTTAGGGAAATAGGCCAGGTTTTACCGTA
ACACGCCACATCTTGCGAATATATGTGTAGAACTGCCGAAATCGTCGTGGTATTCACTCCAGAGCGATGAA
AACGTTTCAGTTTGCTCATGGAAAACGGTGTAACAAGGGTGAACACTATCCCATATCACCAGCTCACCCTTT
CATTGCCATACGTAATTCGGATGAGCATTATCAGGCGGGCAAGAATGTGAATAAAGGCCGGATAAACTTG
TGCTTATTTTCTTTACGGTCTTTAAAAAGGCCGTAATATCCAGCTGAACGGTCTGGTTATAGGTACATTGAGCA
ACTGACTGAAATGCCTCAAAATGTTCTTTACGATGCCATTGGGATATATCAACGGTGGTATATCCAGTGATTTTT
TTCTCCATTTTAGCTTCCTTAGCTCCTGAAAATCTCGACAACTCAAAAAATACGCCCGGTAGTGATCTTATTTAT
TATGGTGAAAGTTGGAACCTCTTACGTGCCGATCAACGTCTCATTTTCGCCAAAAGTTGGCCCAGGCTTCCCGG
TATCAACAGGGACACCAGGATTTATTTATTCTGCGAAGTGATCTTCCGTCACAGGTAGGCGCGCC**GAAGTTCCT**
ATACTTTCTAGAGAATAGGAACCTTCGGAATAGGAACT**AAGGAGGATATTCATA**-3'

arcA: 5'-

TTGGTAACACGCAACACGTTGAAAAGCATTTTCG**GTGTAGGCTGGAGCTGCTTGAAGTTCCTATACTTTCTAG**
AGAATAGGAACCTTCGGAATAGGAACT**AAGGAGGATATTCATAT**GCCGATTGTAACATTTGGAATCAACGC
CGGATACGCCAGAAATCATCGA-3'