



**Additional file 7.** Quantitative RT-PCR analysis of gene *araR*, *araD* and gene *ptk* to assess the effect of L-arabinose on the transcription of gene cluster *araR-araD-araA1-ptk*. Total RNA was isolated from *C. acetobutylicum* ATCC 824 wild-type (824WT) and its *ccpA*-inactivated strain (824ccpA). The cells were harvested from P2 medium [without pH controlling and using L-arabinose or L-arabinose-D-glucose mixture (D-glucose, 20 g/L; L-arabinose, 10 g/L ) as the carbon sources] at the middle exponential phase ( $A_{600} \approx 1.5$ ). The expression levels of each gene were normalized to the gene expression in the wild-type strain grown on L-arabinose.