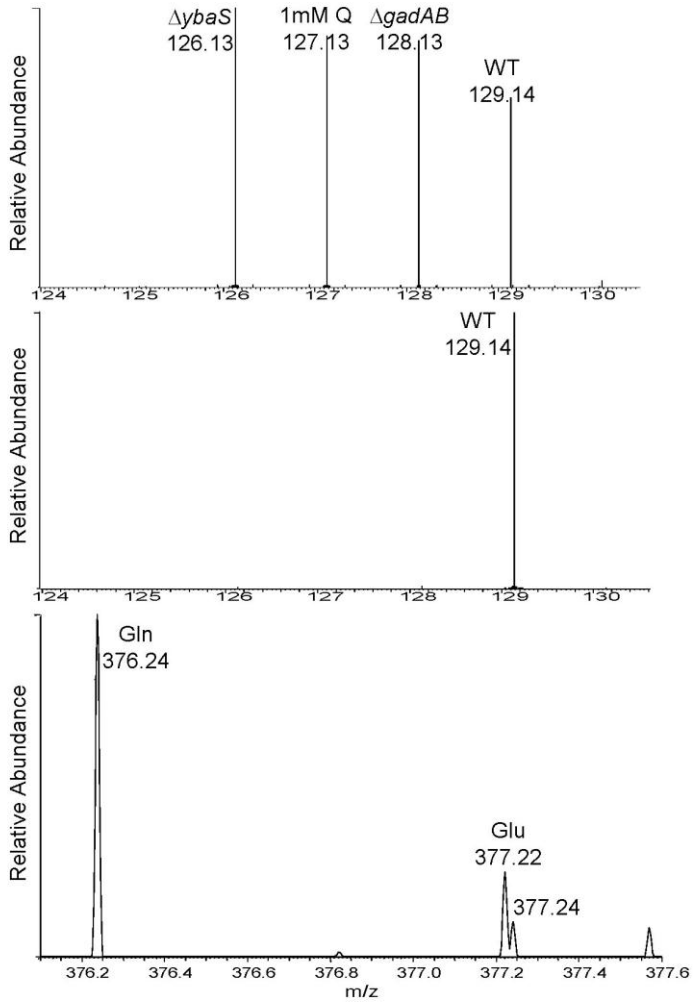


**Supplementary information, Figure S6** Mass spectrometric analysis of Gln and its reaction products at pH 2.5 by WT *E. coli* and its variants.

WT *E. coli* and its variants of different genetic background were incubated for 40 minutes in citrate buffer (pH 2.5) in the presence of 1 mM Gln. Then the supernatant was incubated with distinct TMT reagents. The Δ*ybaS* variant was labeled with TMT-126; Gln alone as a control was labeled with TMT-127; the Δ*gadAB* variant was labeled with TMT-128; and WT *E. coli* was labeled with TMT-129. Then the labeled supernatants were pooled and analyzed by mass spectrometry. The upper panel shows the MS/MS spectrum of the TMT-labeled Gln/Glu at the m/z range of 375.24 to

377.24. The fragments observed at m/z 126.13, 127.13, and 128.13 have similar peak intensity, indicating that the combined concentrations of Gln/Glu in the supernatants from Δ*ybaS* variant, Gln control, and Δ*gadAB* variant are similar. This result is fully consistent with our expectation. However, the intensity of the fragment at m/z 129.14 from the WT sample is smaller than those from the other samples, indicating some Gln/Glu in WT *E. coli* had been converted to other products (presumably GABA). The middle panel shows the MS/MS spectrum of the species at m/z 333.23 which corresponds to TMT-labeled GABA. The fragmentation product was observed at m/z 129.14, indicating that Gln can be converted to GABA only in WT *E. coli*. The bottom panel shows the MS spectrum of the labeled Gln/Glu in the sample from the Δ*gadAB* variant. The peak at m/z 376.24 corresponds to TMT-labeled Gln, and a peak of TMT-labeled Glu at m/z 377.22 was observed that is distinct from the $^{13}C$ isotopic peak of TMT-labeled Gln at m/z 377.24. This analysis confirms that approximately 20 percent of Gln had been converted to Glu in this sample.