

**Table S2. Kinetic parameters obtained using the ATP- $^{32}\text{P}$ PP<sub>i</sub> exchange assay with CmaA**

Substrate	$K_m$ (mM)	$k_{\text{cat}}$ (min <sup>-1</sup> )	$k_{\text{cat}}/K_m$ (mM <sup>-1</sup> ·min <sup>-1</sup> )
L- <i>allo</i> -Ile	0.26 (0.07)	398 (27)	1,550 (360)
L-Ile	0.25 (0.06)	31.3 (1.4)	124 (28)
L-Val	1.2 (0.2)	130 (6)	106 (15)

Values in parenthesis represent standard errors. Rates of 2.13 min<sup>-1</sup> and 0.4 min<sup>-1</sup> were obtained with 5 mM  $\gamma$ -Cl-L-*allo*-Ile and  $\gamma$ -Cl-L-Val, respectively.