Supplementary Information for

Kinetic Evidence for Inter-Domain Communication in the Allosteric Regulation of α -Isopropylmalate Synthase from *M. tuberculosis*.

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Protein	$S_{20,w}$
Dimer (HydroPro)	$7.9 S^{a}$
Monomer (HydroPro)	$4.3 S^{a}$
Wild type	8.5 <i>S</i>
Wild type + Leucine	8.2 S
E218A IPMS	7.5 S
E218A + Leucine	7.7 <i>S</i>
H379A IPMS	8.6 S
H379A + Leucine	8.1 S
Y410F IPMS	8.7 S
Y410F + Leucine	9.2 S

Table S1. Ultracentrifugation Results for Wild-Type and Mutant IPMS

^avalues were calculated in Hydropro (Garcia De La Torre, J., Huertas, M. L., and Carrasco, B. (2000) Calculation of hydrodynamic properties of globular proteins from their atomic-level structure, *Biophys J* 78, 719-730.) using the coordinates of PDB file 1SR9

Supplemental Figure Legends

Figure S1. ClustalW was used to align the amino acid sequence of α-IPMS enzymes from eubacteria (*E. coli*, *S. aureus*, *S. enteric* serovar *typhimurium*, *M. tuberculosis*, *C. glutamicum*, *H. influenza*, and *R. eutropha*), archea (*S. solfataricus* and *A. fulgidus*), plants (*A. thaliana*), and fungi (*S. cerevisae* and *N. crassa*). Residues colored red are strictly conserved and residues colored blue are strongly similar in at least 90% of the sequences (*i.e.* only one outlier)

Figure S2. Eadie-Hofstee plot of wild-type, E218A, and H379A IPMS. The Eadie-Hofstee plot $(v/[\alpha-KIV] \text{ vs. } v)$ is superior to the Lineweaver-Burk plot for ensuring that curvature in initial velocity replots is real (and not due to a one or two bad points) because the data are evenly weighted relative to the Lineweaver-Burk plot.

Figure S3. ¹H-NMR analysis of the reaction of Y410F IPMS. The initial spectrum (upper) was taken prior to addition of enzyme. A second spectrum was taken after the reaction had reached completion (lower spectrum).

Figure S1.

Styphimurium Ecoli Hinfluenzae Reutropha Athaliana Saureus Ssolfataricus Afulgidus Cglutamicum Mtuberculosis Scorevisiae Ncrassa	Styphimurium Ecoli Hinfluenzae Reutropha Athaliana Saureus Ssolfataricus Statugidus Cglutamicum Mutberculosis Scerevisiae Ncrassa	Styphimurium Ecoli Hinfluenzae Reutropha Athaliana Saureus Ssolfataricus Afulgidus Cglutamicum Muberculosis Scerevisiae Ncrassa	Styphimurium Ecoli Hinfluenzae Reutropha Athaliana Saureus Ssolfataricus Stolfataricus Cglutamicum Muberculosis Scerevisiae Ncrassa	Styphimurium Ecoli Hinfluenzae Reutropha Athaliana Saureus Solfataricus Afulgidus Afulgidus Cglutamicum Mtuberculosis Scerevisiae Ncrassa
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Figure S3.

