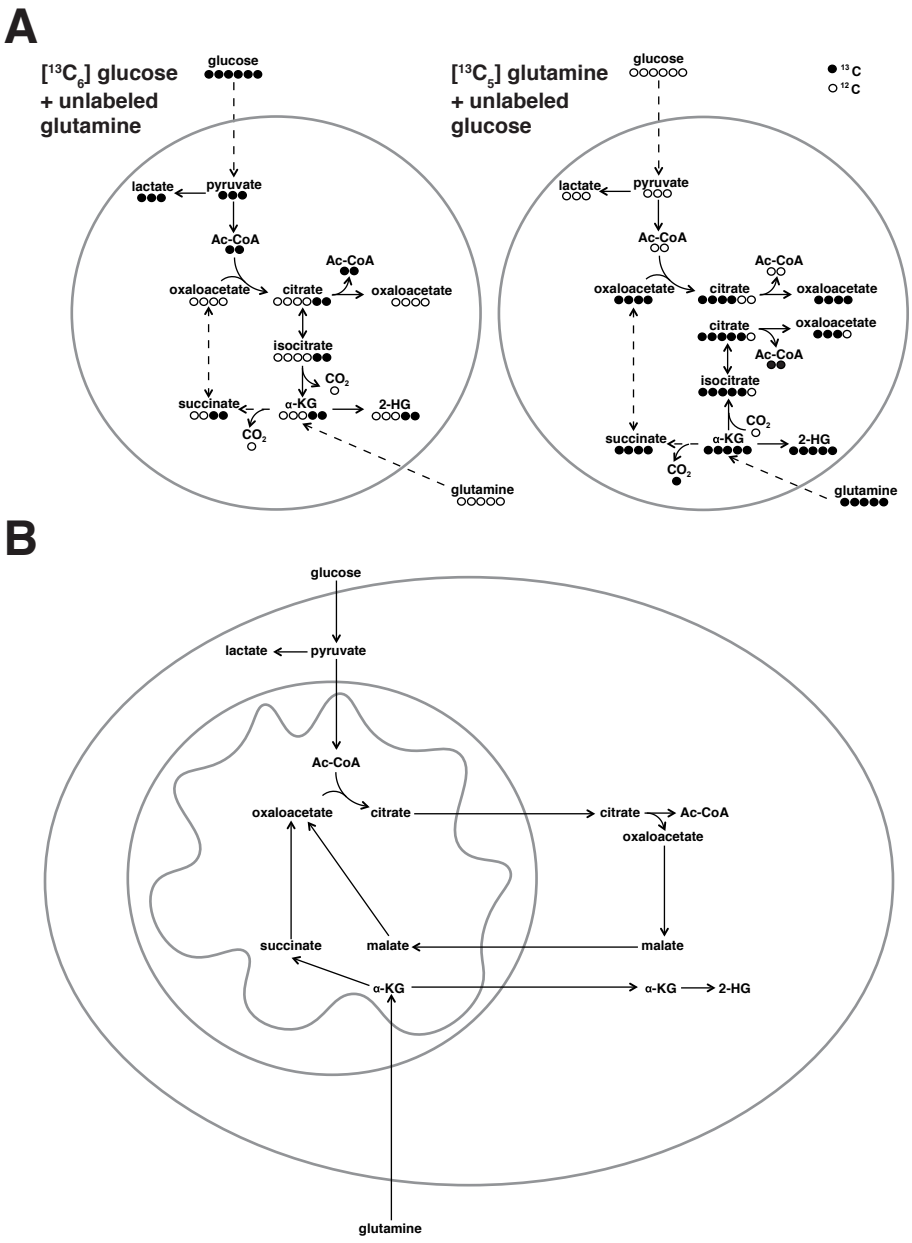

Supplemental Figure 1: **Labeling diagrams for stable isotope tracing experiments. A** Schematics of predicted labeling from one turn of the traditional TCA cycle when cells are grown in culture media either (left) with glucose uniformly labeled with ^{13}C ($[^{13}C_6]$ glucose) and unlabeled glutamine or (right) with glutamine uniformly labeled with ^{13}C ($[^{13}C_5]$ glutamine) and unlabeled glucose. $[^{13}C_6]$ glucose is converted to doubly labeled citrate, α-KG, succinate, and 2-HG. $[^{13}C_5]$ glutamine is converted to fully labeled α-KG, succinate, and 2-HG and to 4- or 5-carbon labeled citrate. Citrate can also be converted to acetyl-CoA and oxaloacetate by ATP citrate lyase. Dashed arrows indicate that one or more intermediate reactions have been omitted from the diagram for clarity. **B** Model to explain the observed labeling data, in which citrate generated from intramitochondrial oxaloacetate and acetyl-coA is exported to the cytosol, where it can be cleaved to regenerate acetyl-CoA and oxaloacetate. The oxaloacetate can be re-imported into the mitochondria as malate in exchange for an α-KG generated from glutaminolysis. This cytosolic α-KG can be used directly by mutant IDH1 to generate 2-HG in the cytosol.