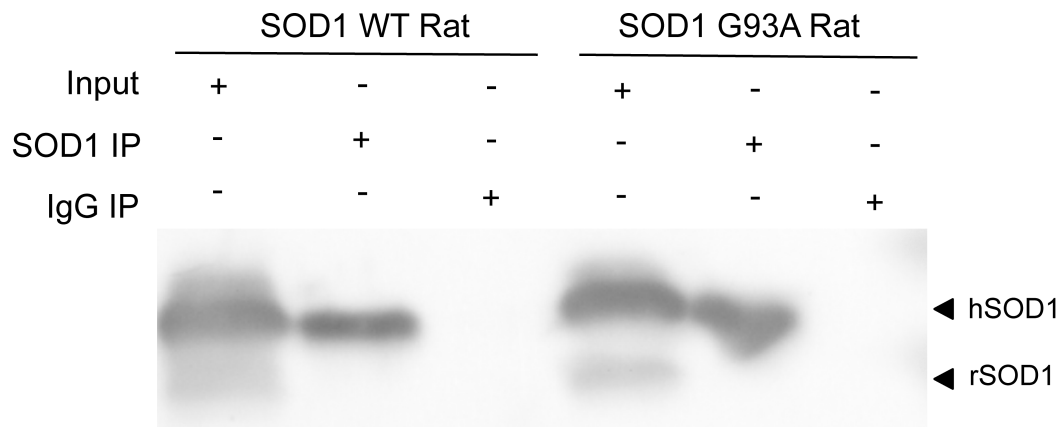


## Supplemental Figure Legends

**Supplemental Figure 1. Immunoprecipitation of human SOD1 transgenic rats.** Western blot showing the successful immunoprecipitation of SOD1 from SOD1 WT and G93A transgenic rat spinal cord using magnetic beads covalently coupled to anti-SOD1 antibodies. hSOD1 signifies human SOD1 and rSOD1 signifies rat SOD1.

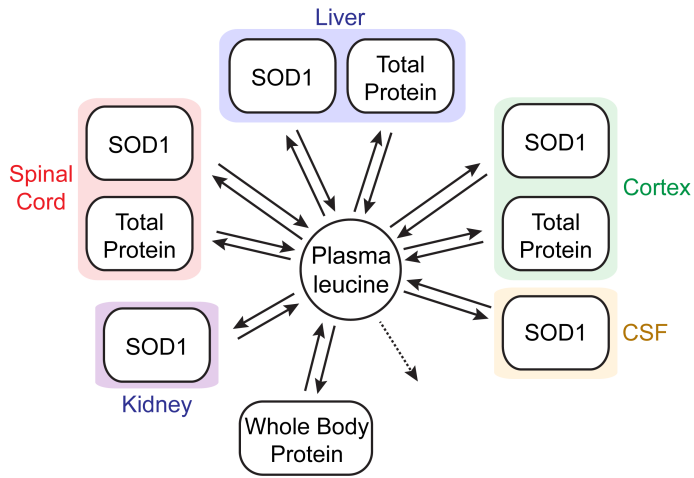
**Supplemental Figure 2. Kinetic models developed for this study.** In each model, plasma leucine represents a central compartment where tracer freely exchanges with all other measured compartments and whole body protein or is irreversibly lost from the system. From this central compartment, forward arrows indicate the forward exchange of tracer into each tissue compartment. The reverse arrows indicate tracer return and represent the FTR, expressed as pools per day, for each compartment. Dotted lines represent irreversible loss of tracer from the system. A) Diagram of the compartmental model accounting for plasma  $^{13}\text{C}_6$ -leucine, tissue-specific soluble SOD1, and total protein over the full time course in SOD1 WT rats. B) Diagram of the compartmental model accounting for plasma  $^{13}\text{C}_6$ -leucine, tissue specific soluble SOD1, misfolded SOD1, and total protein over the full time course in SOD1 G93A rats. C) Diagram of the compartmental model accounting for plasma free  $^{13}\text{C}_6$ -leucine, CSF total protein, and CSF SOD1 over the full time course for human participants receiving a 10-day course of  $^{13}\text{C}_6$ -leucine followed by a normal diet.

**Supplemental Figure 3. Correlations between the three leucine-containing SOD1 peptides used in this study.** High correlations confirm the accuracy of mass spectrometric quantification of tracer:tracee measurements for tissue-specific SOD1.  $R^2 > 0.9199$  and  $p < 0.0001$  for all groups.

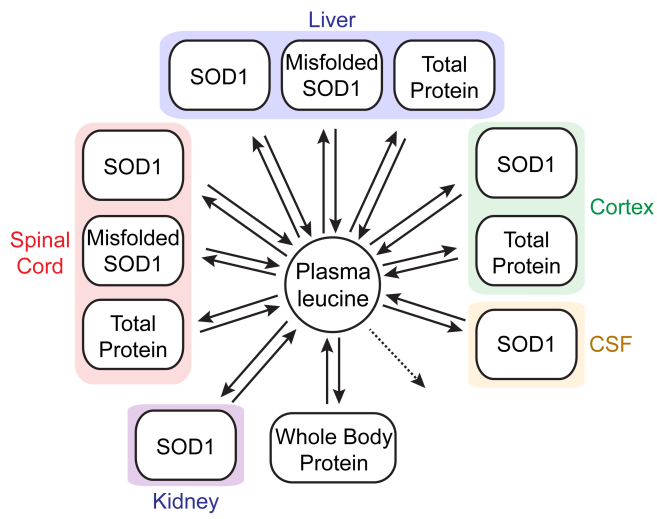
**Supplemental Figure 1**

**Supplemental Figure 2**

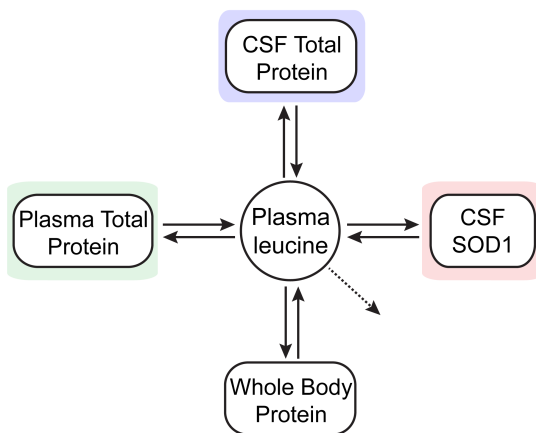
**A**



**B**



**C**



### Supplemental Figure 3

