GLUTATHIONYLATION AT CYS 111 INDUCES DISSOCIATION OF WILD TYPE AND FALS MUTANT SOD1 DIMERS

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SUPPLEMENTAL DATA

Table S1. Average values for the rate and contribution of the artificial fast decay obtained by double exponential fit to Guggenheim data. The derivative of raw SPR data was fit to a double exponential (as described in Materials and Methods):

$$\frac{dRU}{dt} = A_0 e^{\frac{-t}{A_1}} + A_2 e^{\frac{-t}{A_3}} \quad (1)$$

Average rates are listed ± S. D. The contribution of each rate is calculated using:

$$\frac{A_0 A_1 e^{-\frac{t_0}{A_1}}}{A_0 A_1 e^{-\frac{t_0}{A_1}} + A_2 A_3 e^{-\frac{t_0}{A_3}}} \times 100 \quad (2)$$

where t_0 is the initial time value of the data set fit using Eq. 1.

	Average fast rate (s^{-1}, n = 3)	Average contribution of fast rate (%, n = 3)
WT	$1.60 \times 10^{-3} \pm 3.7 \times 10^{-4}$	3.8 ± 0.7
GS-WT	$2.23 \times 10^{-3} \pm 9.3 \times 10^{-4}$	4.6 ± 2.9
I112T	$1.27 \times 10^{-3} \pm 2.2 \times 10^{-4}$	9.2 ± 2.9
GS-I112T	$1.03 \times 10^{-3} \pm 0.7 \times 10^{-4}$	16.4 ± 1.3
A4V	$1.10 \times 10^{-2} \pm 2.1 \times 10^{-3}$	31.2 ± 3.7
GS-A4V	$1.20 \times 10^{-2} \pm 1.7 \times 10^{-3}$	15.8 ± 10.0

Figure S1. Effects of glutathionylation on the SOD1 dimer interface. Residues for each monomer are shown on the x- and y-axes. Contact maps show the differences in frequency of residue-residue contacts in the glutathionylated species as compared to the unmodified species. A contact is defined as C_α-C_α distance of 10 Å or less. At each simulation snapshot (5 picoseconds of simulation time), all contacts present between the two monomers are counted. Contact frequencies are the normalized count of interactions between every pair of residues over the entire simulation.

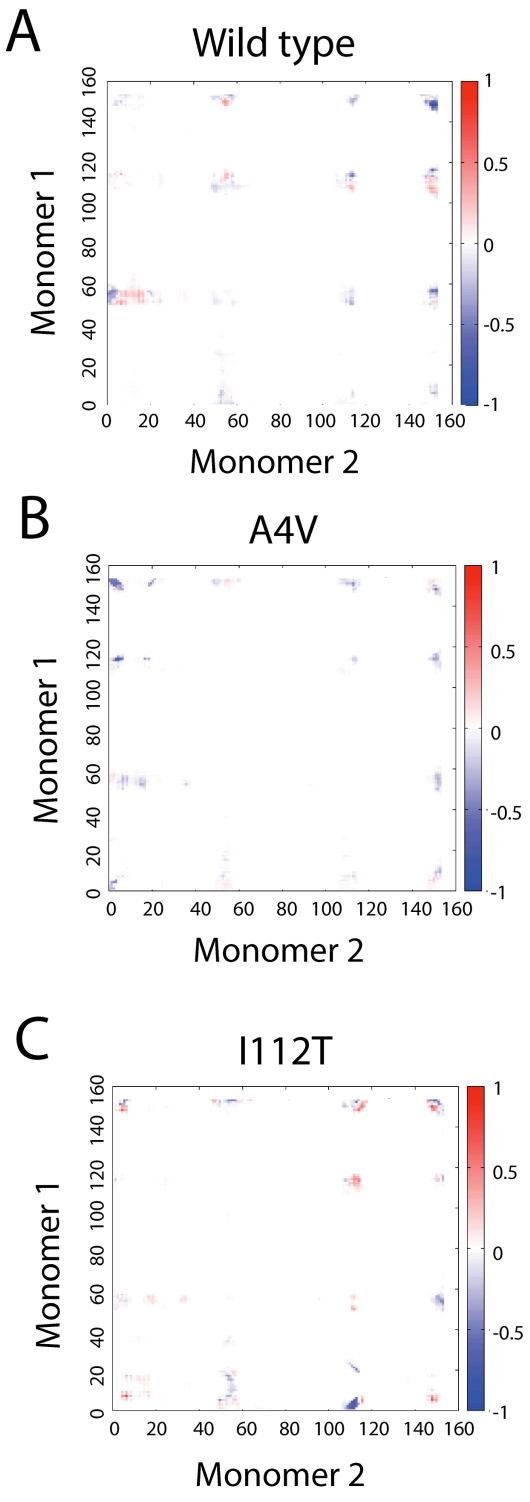

Figure S2. Comparison of C_α and C_β dimer interface contacts. Distributions of changes in frequency of both C_α-C_α (backbone) and C_β-C_β (side-chain) dimer interface contacts upon Cys-111 glutathionylation for (a) wild type, (b) A4V, and (c) I112T SOD1. Wild type SOD1 shows a reversal of behavior in the two types of contacts; the interface undergoes an overall loss of backbone contacts, but gains side-chain contacts, indicating the ability of the side-chains to rearrange upon separation of the monomer backbones. This behavior is not observed in A4V or I112T SOD1, whose distributions have similar qualitative behavior between backbone and side-chain contacts.