

Supplementary Material for : Cysteine-Mediated Redox Signalling in the Mitochondria

D.W. Bak,^a and E. Weerapana^a

^a Department of Chemistry, Merkert Chemistry Center, Boston College, Chestnut Hill, Massachusetts 02467, United States.

Table S1

Table 1 : Mitochondrial protein targets of oxidation, nitrosation, and glutathionylation.

Protein	Type of Modification	Site of Modification	Cysteine Function	Effect of Modification	References
Aconitase	Nitrosation	unknown	N.A.	enzyme inhibition	1, 2, 3, 4
	Glutathionylation	unknown	N.A.	reversible enzyme inhibition	3
	Oxidation (sulfonic acid)	Cys ₁₂₆ and Cys ₃₈₅	unknown (Cys ₁₂₆) and metal binding (Cys ₃₈₅).	decreases enzyme activity	5
ANT	Glutathionylation	unknown	N.A.	inhibits formation of MPTP	6
	Oxidation (sulfenic acid)	Cys ₁₆₀ N.A.	disulfide bond	mediates disulfide bond formation with Cys ₂₅₇	7
	Oxidation (disulfide)	Cys ₁₆₀ and Cys ₂₅₇	disulfide bond	required for MPTP formation	7
Aspartate Aminotransferase	Nitrosation	unknown	N.A.	unknown	1
Bcl-2	Oxidation (sulfenic acid)	Cys ₁₅₈ and Cys ₂₂₉	regulatory	disruption of Bcl-2/ERK complex, ERK activation and apoptosis	8
Carnitine Palmitoyltransferase	Nitrosation	unknown	N.A.	unknown	4
	Glutathionylation	Cys ₁₃₆ and Cys ₁₅₅	disulfide bond	increased transport activity	9
Citrate Synthase	Nitrosation	unknown	N.A.	unknown	1
Cofilin	Oxidation (disulfide)	Cys ₃₉ , Cys ₈₀ , Cys ₁₃₉ , and Cys ₁₄₇	disulfide bond	disulfide bond formation results in mitochondrial localization and MPTP opening	10
Complex I	Nitrosation	Cys ₃₉ of ND3 subunit	regulatory	prevents reactivation of Complex I	11
	Glutathionylation	Cys ₅₃₁ and Cys ₇₀₄	regulatory	lowers electron transfer activity /decreases ROS production	12, 13
Complex II (SDH)	Nitrosation	unknown	N.A.	unknown	1, 4
	Glutathionylation	Cys ₉₀ of the 70 kDa subunit	regulatory	enhances electron transfer activity and decreases ROS production	14
Complex III	Nitrosation	unknown	N.A.	unknown	1, 4

Complex IV	Glutathionylation	unknown	N.A.	unknown	15, 16
Complex V	Glutathionylation	Cys ₂₉₄ of the α -subunit	disulfide bond with Cys ₁₀₃	decreases enzyme activity	17
	Oxidation (sulfenic acid)	Cys ₂₉₄ of the α -subunit	disulfide bond with Cys ₁₀₃	decreases enzyme activity	17
CpD	Glutathionylation	Cys ₂₀₃	regulatory	prevents MPTP opening	18
Drp1	Nitrosation	Cys ₆₄₄	regulatory	activates mitochondrial fission	19
Enoyl-CoA Hydratase	Nitrosation	unknown	N.A.	unknown	1, 4
ETF:QO	Nitrosation	unknown	N.A.	unknown	1, 4
HMG-CoA Synthase	Nitrosation	unknown	N.A.	unknown	20
IDH2	Glutathionylation	Cys ₂₆₉	regulatory	reversibly inhibits activity / protective against ROS	21
IDH3	Nitrosation	unknown	N.A.	unknown	1, 4
ME	Nitrosation	unknown	N.A.	unknown	1, 8, 20
Mfn1/2	Glutathionylation	unknown	N.A.	increases GTPase activity and mitochondrial fusion	22
MnSOD	Glutathionylation	unknown	N.A.	loss of SOD activity	23
ODH	Nitrosation	unknown	N.A.	unknown	2, 8
	Glutathionylation	lipoate	catalytic cofactor	protective against ROS	24
PARK2 (Parkin)	Nitrosation	Cys ₃₂₃	regulatory	increase enzyme activity and subsequent mitophagy	25
PARK7 (DJ-1)	Oxidation (sulfinic acid)	Cys ₁₀₆	Unknown	mitochondrial localization	26, 27, 28
PDH	Nitrosation	unknown	N.A.	unknown	20
Prx3	Oxidation (sulfenic and sulfinic acid)	Cys ₁₀₈	peroxidatic cysteine	catalytic intermediate (sulfenic) /inhibitory (sulfinic)	29, 30
Sarcosine Dehydrogenase	Nitrosation	unknown	N.A.	unknown	20
SCAD	Nitrosation	unknown	N.A.	unknown	4
SOD2	Glutathionylation	unknown	N.A.	decreases enzyme activity	23
Succinyl-CoA Ligase	Nitrosation	unknown	N.A.	unknown	1
Succinyl-CoA Transferase	Glutathionylation	unknown	N.A.	decreases enzyme activity	17
UCP2	Glutathionylation	unknown	N.A.	inhibits proton leak	31, 32

UCP3	Glutathionylation	Cys ₂₅ and Cys ₂₅₉	regulatory	inhibits proton leak	31
VDAC2	Nitrosation	unknown	N.A.	unknown	1
VLCAD	Nitrosation	unknown	N.A.	unknown	1, 4

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