## Structure-Function Analysis of a Novel Mitochondrial Antioxidant Protein

Zhenbo Cao<sup>a,b</sup>, Louise Gourlay<sup>a</sup>, Neil Isaacs<sup>b</sup>, Gordon Lindsay<sup>a</sup>, <sup>a</sup>Division of Biochemistry and Molecular Biology, Institute of Biomedical and Life Sciences <sup>b</sup>Department of Chemistry, University of Glasgow, UK. E-mail: 0108962c@student.gla.ac.uk

Bovine mitochondrial SP-22 is a member of the peroxiredoxin family which is a novel antioxidant enzymes. It belongs to the typical 2-Cys Prxs containing three cysteines at positions 47, 66, and 168. Its coelution with E3 of PDC indicate possible interaction between them. SP-22 can be reduced by DTT and oxidized by  $H_2O_2$ . By electronic microscopy study, SP-22 forms a stable decameric toroid consisting of five basic dimeric units. By GFC study, it is found that SP-22 stay as a decamer under different conditions (salt concentration, pH, redox statue). Preliminary crystallography study of SP-22 has been done. 3.3A data of C168S mutation SP-22 were collected.

Oxidized SP-22 needs to be reduced by thioredoxin, thioredoxin reductase system. To finish this pathway and have a better understanding of the function of SP-22, human mitochondrial thioredoxin and thioredoixn reductase were cloned, overexpressed and purified. Due to human mitochondrial thioredoxin reductase is a SeCys protein, fully active protein was under investment.

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