# Atomic Model of Microsomal Glutathione Transferase 1 from Electron Crystallography

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The integral membrane protein microsomal glutathione transferase 1 (MGST1) possesses glutathione and peroxidase activity thus protecting the organism from toxic substances. We have determined the atomic model of MGST1 at 3.5Å resolution by electron crystallography of 2-dimensional crystals from two different two-sided plane groups making it the first membrane enzyme solved to atomic resolution by this technique. The MGST1 homotrimer is constructed by 12 trans-membrane helices forming three all alpha-up-down 4-helix bundles with a fold strikingly similar to the cytochrome c oxidase subunit I suggesting divergent evolution from a common structural ancestor. The MGST1 model reveals inter-subunit interaction and strengthens previous suggestions of global conformational changes upon glutathione (GSH) binding. Furthermore a possible location of the putative hydrophobic binding site is suggested.

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