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# Phenylalanine hydroxylase: A biomarker of disease susceptibility in Parkinson's disease and Amyotrophic lateral sclerosis

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### Abstract

The S-oxidation of S-carboxymethyl-L-cysteine has been reported previously to be a biomarker of disease susceptibility in Parkinson's disease and [Amyotrophic lateral sclerosis](#). In this investigation, the original observations have been confirmed with the incidence of the [poor metaboliser](#) phenotype (no urinary recovery of S-oxide metabolites) being found to be 3.9% within healthy control population. However, 38.3% of the Parkinson's disease subjects and 39.0% of the Amyotrophic lateral sclerosis group were phenotyped as poor metabolisers. The consequent odds risk ratio of developing Parkinson's disease was calculated to be 15.5 (95% CI 9.5–25.3) and for Amyotrophic lateral sclerosis was 15.2 (95% CI 8.8–26.5). Thus, the possible role of the enzyme responsible for the S-oxidation biotransformation reaction, [phenylalanine](#) hydroxylase, must be further investigated to elucidate the mechanism(s) of toxicity in susceptible individuals displaying these diseases. A dual role potentially explaining of the role of phenylalanine hydroxylase as a biomarker of disease susceptibility is presented together with the observation that [metabolomics](#) is a possible way forward in the identification of potential pro-toxins/toxins in those individuals phenotyped as poor metabolisers (Controls, Parkinson's disease and Amyotrophic lateral sclerosis subjects).

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