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Evidence for a Hybrid Ping Pong-Semirandom Mechanism for Human Jejunal Glutathione Disulfide Reductase

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Abstract: Initial rate versus substrate concentration, [S], profiles (at pH 7.4, 37°C) for human jejunal glutathione disulfide reductase indicated partial substrate inhibition by GSSG at fixed [NADPH] $\leq 40 \mu$ M. Saturation by NADPH assumed an increasingly sigmoidal character at fixed [GSSG] $\geq 20 \mu$ M. The results were interpreted in terms of a hybrid ping pong-semirandom mechanism proceeding through both E.NADPH (ping pong pathway) and E.GSSG (ordered pathway) complexes. When $V(\text{apparent})$ versus [GSSG] and [NADPH] were plotted, hyperbolic curves were obtained. Plotting $1/V(\text{apparent})$ versus $1/[NADPH]$ and $1/[GSSG]$ yielded two lines with different slopes but intersecting at the same point on the y axis. A value of 26.3 U/ml was calculated for V_m , and K_m values of 25 and 71 μ M were determined for NADPH and GSSG, respectively.

Key Words: Glutathione disulfide reductase, ping pong-semirandom mechanism, human jejunum.

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