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Crystal Structure of the Escherichia Coli Thioesterase II, a Homolog of the Human Nef Binding Enzyme

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ABSTRACT: Here we report the solution and refinement at 1.9 A resolution of the crystal structure of the Escherichia coli medium chain length acyl-CoA thioesterase II. This enzyme is a close homolog of the human protein that interacts with the product of the HIV-1 Nef gene, sharing 45% amino acid sequence identity with it. The structure of the E. coli thioesterase II reveals a new tertiary fold, a 'double hot dog', showing an internal repeat with a basic unit that is structurally similar to the recently described beta-hydroxydecanoyl thiol ester dehydrase. The catalytic site, inferred from the crystal structure and verified by site directed mutagenesis, involves novel chemistry and includes Asp 204, Gln 278 and Thr 228, which synergistically activate a nucleophilic water molecule.