The structure of adenylosuccinate lyase, an enzyme with dual activity in the de novo purine biosynthetic pathway.

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Abstract
BACKGROUND: Adenylosuccinate lyase is an enzyme that plays a critical role in both cellular replication and metabolism. Mutations in the human enzyme have been linked to severe clinical consequences, including mental retardation with autistic features.

RESULTS: The 1.8 Å crystal structure of adenylosuccinate lyase from Thermotoga maritima has been determined by X-ray crystallography. The enzyme exists as a tetramer, with each monomer composed of two active and two inactive forms.

CONCLUSIONS: This first structure of an adenylosuccinate lyase reveals that, along with the catalytic base (His141), the enzyme contains tertiary and quaternary structures that contribute to the enzyme's activity and specificity.

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