

THREE-DIMENSIONAL STRUCTURE OF A TYPE III GLUTAMINE SYNTHETASE BY SINGLE PARTICLE RECONSTRUCTION

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This study represents the first structural investigation of any type III glutamine synthetase (GS). GlnA, from the medically important opportunistic human pathogen *Bacteroides fragilis* was studied with a view to better understanding allosteric regulation of the enzyme. Images (160) of negatively stained rGlnA, were recorded at 50K magnification using a Leo 912 operating at 120kV with energy filtering coupled to a 4 megapixel CCD camera. The reconstruction was determined at a resolution of 2.1nm from 12587 particles using a multi-reference alignment and angular refinement strategy. In contrast to preliminary EM observations, which identified GlnA as a hexamer, this work has revealed a dodecameric structure, with subunits (82.8KDa) arranged in two opposing hexagonal rings with distinct handedness. This is similar to the quaternary structure of GSIs and GlnTs except that the complex is 50