Flavin-containing opine dehydrogenase from *Bradyrhizobium japonicum* forms a heterooligomeric $\alpha_4\beta_4\gamma_4$ enzyme complex. An electron paramagnetic resonance spectroscopy analysis using wild-type and site-directed mutants revealed that [4Fe-4S] and [2Fe-2S] clusters bind to two different types of [Fe-S] binding sites in the γ - and α -subunits, respectively. The latter was found to be important for structural folding and enzyme catalysis.