A new Lanthanide Complex for solving Protein Structures using Anomalous Scattering

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A complex of europium, Na_3.[Eu(pyridine-2,6 dicarboxylate)$_3$], was used to solve macromolecular structures by anomalous diffraction methods (MAD and SAD).

Crystals of thaumatin I from *Thaumatoccus daniellii* were soaked in 100 mM of the Eu complex. The structure was solved by the MAD method using data from synchrotron radiation measured to a resolution of 1.46 Å, at the L_{III} absorption edge of Eu.

Hen egg-white lyzosyme derivative crystals were obtained by cocrystallization in 100 mM of the Eu complex leading to a new crystal form belonging to space group C2. This new structure was solved by the SAD method using data collected with a rotating anode generator. Phases were extended to 1.3 Å resolution using data collected with synchrotron radiation at $\lambda = 0.931$ Å.

The symmetry of the free Eu complex is 23. In both structures, the complex is fixed on several sites, one of which is located on a crystallographic 2-fold axis. In the complex, the coordination of Eu is complete. Thus the complex is bound to the protein through the ligand only. In the experimental electron density maps of the two structures the electron density of the complex is well defined around the highly occupied Eu sites.

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