X-ray study of ceruloplasmin-lactoferrin complex

V.R. Samygina, A.N. Sokolov[1], B.V. Vassilyev[1], H. Bartunik[2].

Institute of crystallography, RAS, Leninski pr. 59, 119333 Moscow, Russia
[1]Institute for Experimental Medicine, Russian Academy of Medical Sciences, ul. Akademika Pavlova 12, 197376 St. Petersburg, Russia
[2]MPG-ASMB c/o DESY, Protein Dynamics Group, Notkestraße 85b, 22607 Hamburg, Germany

Ceruloplasmin is a copper protein with molecular weight ~ 132,000 was found in vertebrate plasma, which belongs to the family of multicopper oxidases. Like transferrin of the blood plasma, lactoferrin (Mr ~78,000), the iron-containing protein of human milk, saliva, tears, seminal plasma and of neutrophilic leukocytes tightly binds two ferric ions. Human lactoferrin and ceruloplasmin have been previously shown to interact both *in vivo* and *in vitro* forming a complex [1]. On account of the selectivity of the interaction between the exogenous Lf and rat Cp that competed with other plasma proteins, we found that the Cp-Lf complex present in biological fluids: breast milk, tears, serum of patients with supportive inflammation. Since Lf increases ferroxidase activity of Cp and possesses bactericidal properties, the Cp-Lf complex very likely takes part in host defense reactions against pathogenic microorganisms. However, the zone of interactions and mechanism of functioning this protein-protein complex are unknown.

The crystals of ceruloplasmin-lactoferrin with size 0.02-0.03 mm were grown at 4° by hanging drop method. The complex formation in crystalline state has been checked by SDS-PAGE of dissolved crystals. The x-ray fluorescence spectrum of crystal also had shown a presence of copper and iron in crystals. Data set was collected on the BW6 beamline (DESY, Hamburg) to 3.4 Å resolution (R_{merge}=14.9, completeness 99.8, I/sig(I)=5.6). Crystals belong to space group $P3_221$ (a=b=211.6 c=82.9) Data were processing using programs DENZO and SCALEPACK [2]. Unfortunately, structure was not solved by molecular replacement; the experiment using SAD is underway.

References

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