Studies on the interaction between ferritin and ceruloplasmin

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摘要

Abstract

We showed previously that ceruloplasmin associates with the H chain of rat liver ferritin during iron loading into ferritin such that the iron oxidized by ceruloplasmin was deposited into ferritin S.-H. Juan et al. (1997) Arch. Biochem. Biophys. 341, 280-286. Three synthetic decapeptides derived from domains 2, 4, and 6 of ceruloplasmin, referred to CP-2, CP-4, and CP-6, were utilized to identify a possible binding site on ceruloplasmin for ferritin. Two of the peptides, CP-4 and CP-6, were found to inhibit iron loading into the recombinant ferritin H chain homopolymer (rH-Ft) by ceruloplasmin. The extent of inhibition of iron loading into ferritin by ceruloplasmin by CP-6, but not CP-4, varied with pH, whereas the inhibitory effect remained constant in increasing concentrations of NaCl. The addition of rH-Ft quenched the fluorescence emission of CP-4 and CP-6, but not CP-2. The quenching of fluorescence was used to estimate dissociation constants for the peptides. Iron loading into ferritin in Hepes buffer was not affected in the presence of these peptides. In addition, synthetic peptides corresponding to the BC loop of ferritin H and L chains were utilized to localize an interaction site on ferritin for ceruloplasmin. The BC loop of H chain but not L chain of ferritin stimulated the ferroxidase activity of ceruloplasmin. Only the BC loop of ferritin H chain decreased the amount of iron loading into ferritin by ceruloplasmin.