Crystal Structure of DNA aptamer Human Cystatin B (CSTB) Protein Complex by X-ray.

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Hepatocellular carcinoma(HCC) is the fourth most common cancer. It is not any noticeable signs or symptoms in the early stages. When HCC is diagnosed in the later stage, there is very poor with a 5-year survival rate than 10-15%. In general, HCC detection is measured by identification of Alpha-fetoprotein(AFP) expression level in serum. However, it has reported that AFP is poor sensitivity and specificity for HCC detection. For this reason, new tumor marker is required for improvement of HCC diagnosis. Cystatin B(CSTB) is a member of the cysteine protease inhibitor superfamily and intracellular thiol protease inhibitor. CSTB mRNA is overexpressed in most HCC and is elevated in the serum of a large proportion of patients with HCC. In this study, we set up CSTB crystallization for structure analysis of CSTB with and without aptamer. The CSTB gene was cloned in pGEX-4T-1 and expressed by E.coli. The protein was purified by two step purification and set up for crystallization as sitting drop vapor diffusion at 291K temperature. The developments of CSTB aptamer-based biosensor can be applied to diagnosis of HCC and recurrence cancer advance.