Structural and affinity analyses of ssDNA aptamers specifically Glypican-3 targets HCC

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Glypicans are heparan sulfate proteoglycans linked to the cell surface and play an important role in regulation of cell growth, differentiation, and migration. While six members of the glypican family, Glypican-3 (GPC3) is an efficient diagnostic marker of human hepatocellular carcinomas (HCC). Aptamers are single-strand oligonucleotides able to bind specifically and sensibility to target molecules, offering great potential for applications in diagnosis and therapy. In addition, aptamers generally have higher specificity and stability for their targets than corresponding antibodies, and this has significant advantages when it comes to detection. ssDNA aptamers were selected using the SELEX (Systematic Evolution of Ligands by EXponential enrichment) methodology from an initial library containing a 40 bases long variable region. After in vitro selection, the structural stability as affinity ligands of these aptamers specifically were quantified by strict criteria of equilibrium (Kd) using Surface Plasmon Resonance (SPR) and compared with the corresponding monoclonal antibodies.