Protein Interface Targeted Aptamers Screened Using Competitive Selection

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Nucleic acid aptamers are single stranded DNA or RNA that bind targets ranging from large biomolecules to small chemicals, with affinities and specificities emulating antibodies, and provide exciting prospects for basic science and therapeutic applications. This project sought to use a site specific aptamer evolution protocol, to tailor aptamers to a less conserved region of furin, a proprotein convertase (PC) in a large protease family implicated in a plethora of biological and pathological processes. Furin immobilization, stringency of aptamer binding and elution, strand separation and purification, and PCR amplification methods were first standardized. After several iterations of selection, the enriched aptamers were cloned and sequenced. Statistical analysis suggests that after four iterations of selection, the aptamer pool is purine enriched ($p=0.006$) with notable site-specific enrichments. Preliminary analyses suggest that selected aptamers display affinity, in the micromolar to nanomolar range, for the targeted interface, and further biochemical analysis continues.

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