Aptamer Based Disruption of the CD47-SIRPα Interface for Anticancer Applications

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Cancer is a leading cause of death and healthcare expenditures globally. In order to grow, cancers circumvent control systems, including the organism's immune system. Certain cancers achieve this through the over-expression of CD47, a cell surface protein that acts as a "don't eat me" signal. CD47 interacts with SIRPα, a protein on macrophages that inhibits cell engulfment. Disruption of this interaction by monoclonal antibodies (mAbs) has been shown to aid the antitumor immune response in vivo. However, mAbs have significant disadvantages, including high cost and instability. Aptamers are small sequences of nucleic acids that can be selected to bind to a wide variety of targets with extraordinary affinity and specificity, rivaling that of mAbs, but without many of the associated issues. This project seeks to develop aptamers that target the CD47-SIRPα interaction. Several aptamers targeting CD47 and SIRPα were generated, and some characterized through surface plasmon resonance and pulldown assays. The results indicate that certain sequences displayed significant affinity towards the targets; studies are ongoing to further characterize the aptamers and measure their ability to disrupt the CD47-SIRPα interaction.

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