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(57) Abstract: Oligonucleotides with a novel sugar-phosphate backbone containing at least one internucleoside 3'-NHP(O)(S')O-5' linkage, and methods of synthesizing and using the inventive oligonucleotides are provided. The inventive thiophosphoramidate oligonucleotides were found to retain the high RNA binding affinity of the parent oligonucleotide N3'→P5' phosphoramidates and to exhibit a much higher acid stability.

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