2-Thio-deoxythymidine (2-Thio-dT) is a thiol-modified deoxyribonucleoside, and is typically used to modify oligos slated for DNA, or DNA-protein, structural studies. 2-thio-dT is often used (in conjunction with 2-amino-dA) to generate "selectively binding complementary (SBC) oligonucleotides". SBC oligos have a unique property: they can bind simultaneously to both the sense and anti-sense strands of a DNA or RNA duplex with high affinity, but show little or no affinity for other SBC oligos of any kind. SBC oligos can be used as probes to investigate secondary structures involving various branching moieties, and can be used as antisense oligos against mRNA targets having a lot of secondary structure. In such oligos, 2-thio-dT replaces T (and 2-amino-dA replaces A). 2-thio-dT base pairs well with dA, but has little affinity for 2-amino-dA. This property is reflected in Tm experiments. SBC 20 mers hybridized against a 20 mer DNA target (SBC-DNA duplex) had Tm values 10 degC higher than that of the corresponding DNA-DNA duplex. The corresponding SBC-SBC duplex had a Tm value 30 degC lower than the DNA-DNA duplex (1).

References