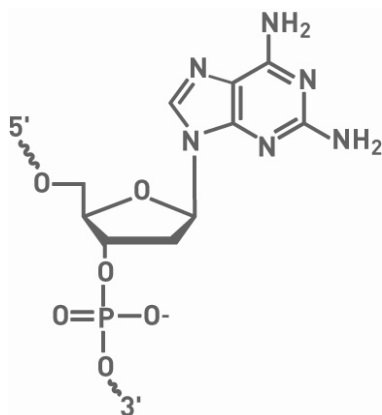


2,6-Diamoinpurine (2-amino-dA)

Structure



Key data

Ab_{max} 278 nm

Extinction Coef (260 nm): 20,960

Extinction Coef (at absorbance max): 10,200

5' MW: 328.2 g/mol

3' MW: 328.2 g/mol

Requires HPLC purification

Properties

This modified base can form three hydrogen bonds when base-paired with dT and can increase the T_m of short oligos by as much as 1-2°C per insertion. This effect, however, is complex and is dependent on sequence context. 2-Amino-dA also destabilizes A-G wobble mismatches, thus increasing specificity.

SBC Oligos

Selectively Binding Complementary (SBC) oligonucleotidesⁱ have the unique property of being able to simultaneously bind to both the sense and antisense strands of a DNA or RNA duplex. This should make them extremely useful for investigating secondary structures such as Holliday junctions and other branching moieties. They may also prove useful as antisense

agents where the mRNA target exhibits significant secondary structure. SBC oligos possess this unique ability because, although they exhibit high affinity for natural oligonucleotides, they show little affinity for other SBC oligos even of a complementary sequence.

Oligos in which A has been replaced with 2-amino-A and T with 2-thio-T represent an excellent example of SBC oligos.ⁱ While 2-amino-A forms a very stable base pair with T containing three hydrogen bonds, the stability of the base pair with 2-thio-T is greatly diminished. Model building suggests that steric interactions between the 2-thio group of thymidine and the 2-amino group of adenine tilt the bases relative to each other yielding a base pair that contains only a single hydrogen bond.ⁱ However, 2-thio-T base pairs perfectly well with A, as shown in Figure 1. But the real proof is not in models: SBC 20mers annealed against a DNA 20mer target exhibited T_m values 10° higher than the corresponding DNA-DNA hybrid, whereas the SBC-SBC hybrid yielded T_m values 30° lower.ⁱ

ⁱ H.K. Nguyen, P. Auffray, U. Asseline, D. Dupret, and N.T. Thuong, *Nucleic Acids Res.*, 1997, 25, 3059-65

