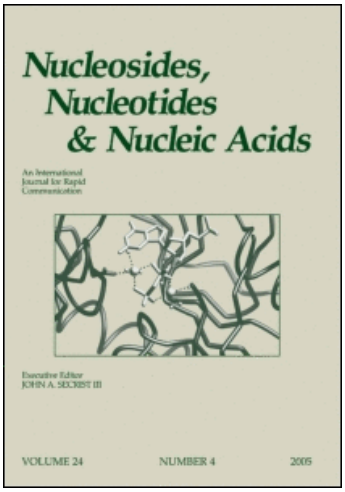

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Effect of length and netropsin binding on base-pair lifetimes of oligonucleotides with the center core GCGAATTCGC

M. Leijon[a]; A. Gräslund[a]
[a] Dept. of Medical Biochemistry and Biophysics, University of Umeå, Umeå, Sweden

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Effect of length and netropsin binding on base-pair lifetimes of oligonucleotides with the center core GCGAATTCGC

M. Leijon and A. Gräslund
Dept. of Medical Biochemistry and Biophysics,
University of Umeå, S-901 87 Umeå, Sweden.

The imino proton solvent exchange of three self-complementary oligonucleotides with different lengths 5'-d([G[C[GCGAATTCGCG]C]G])-3' has been studied by ^{1}H NMR selective saturation recovery. From measurements of the solvent exchange rates at different catalysing ammonia base concentrations it is possible to obtain the base pair lifetimes (1,2). The results at 15°C shows that the base pair lifetime is an individual property dependent on the nature of the base pair and its neighbouring sequence and varies from about 10 to 80 ms for the different base pairs in the core of the oligonucleotides. End effects ("fraying at the ends") with considerably shorter lifetimes are visible at least two or three base pairs from the ends of the oligonucleotide (see table below).

We have also been able to evaluate the base pair lifetimes when netropsin is bound to the 10-mer. Netropsin is known to be a DNA minor groove binding drug with preference for AT-rich DNA sequences (3,4). The new imino proton resonances in the DNA-netropsin complex are split into doublets, showing that the overall symmetry of the oligonucleotide is lost upon netropsin binding. The new resonances were assigned using one dimensional nuclear Overhauser effect

TABLE

The base pair lifetimes (ms) in oligonucleotides of different length at 15° C and in a 1:1 complex with netropsin.

```
 0  1  2 3 4 5 6
 ↓  ↓  ↓ ↓ ↓ ↓ ↓
[G-[C-[G-C-G-A-A-T-T-C-G-C]-G]-C]
```

base-pair	oligonucleotide			10mer-netropsin complex
	10mer	12mer	14mer	
AT6	39	39	39	118
AT5	11	11	12	102
GC4	74	80	76	95
GC3	10	22	55	-
GC2	≤10	≤10	39	-

experiments. Particularly the base pair lifetimes of the AT base pairs were considerably increased.

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