

THE SPECTRAL
PROPERTIES AND PHOTOSTABILITY
OF DNA, RNA, AND OLIGONUCLEOTIDES

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S u m m a r y

The present work discusses the results of comparative investigations of the optical absorption, luminescence, and photostability of the biomacromolecules (DNA, RNA), as well as synthetic poly- and oligonucleotides. The separate nucleotides in DNA and RNA are examined as almost independent absorbing centers. It is confirmed that the main triplet excitons traps responsible for the DNA phosphorescence emission are AT-complexes in DNA. In contrast to DNA, the main triplet excitons traps in RNA are adenosine bases. These bases are the most photostable against UV-irradiation as compared with all other nucleotides in both DNA and RNA. The fact of the photostability of adenosine bases and the AT-complex provides the existence of the DNA/RNA self-protection mechanisms against a damage caused by UV-irradiation. It is found the deoxyribonucleotides are more photostable than the corresponding ribonucleotides. So, the results presented here show that DNA is more photostable than RNA.