Abstract

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Real-time PCR is a widely used method in many laboratories for diagnostic purposes. This method combines PCR with the use of fluorescent signaling agents, probes, to monitor the number of amplicons during each PCR cycle. There are several types of probes used for DNA analysis. Short probes do not form sufficiently stable duplexes with the target DNA sequence to be able to detect single base mismatching. This work provides an overview of the oligodeoxynucleotides (ODN) probes in use and in what way is their thermostability is affected. In the practical part, two structurally distinct acridine derivatives were prepared because they may increase duplex thermostability due to their ability to intercalate between DNA bases. By increasing the thermostability, the melting temperature of the duplex between probe and the target sequence is also increased. For this reason, acridine derivatives form promising compounds suitable for short ODN probes that are characterized by low thermal stability. The described reactions for the preparation of acridine derivatives have been optimized. Finally, one acridine derivative was tested before and after binding to the ODN probe to demonstrate the effect on thermostability of the duplex.