

Electrochemistry of interaction of 2-(2-nitrophenyl)-benzimidazole derivatives with DNA

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In this study the interaction between new benzimidazole molecules, 2-(2-nitrophenyl)-1H-benzimidazole (NB) and N-benzoyl-2-(2-nitrophenyl)-benzimidazole (BNB), with dsDNA and ssDNA was assessed at pH 7.4. Using differential pulse voltammetry at glassy carbon electrode, both molecules were electrochemically reduced due to the presence of a nitro group in their structures. When DNA was added to the solution, the electrochemical signal of NB and BNB decreased and shifted to more negative potentials. The interaction mode was electrostatic when ionic strength was low. Under this condition DNA-nitro complexes were characterized and binding constant values of $8.22 \times 10^4 \text{ M}^{-1}$ and $3.08 \times 10^6 \text{ M}^{-1}$ for NB and BNB with dsDNA were determined. On the other hand, only NB was able to interact when a high concentration of NaCl was used. Finally, a glassy carbon electrode modified with carbon nanotubes and DNA was tested in order to determine the nitrocompound in solution. The electrochemical reduction of the n