Abstract

This paper deals with influence of fructose, glucuronic acid, glucose and mannose on the fluorescence characteristics of probe Click fluor using stationary and time resolved fluorescence spectroscopy. The spectra were measured for a wide range of concentrations (up to 3M), and the change in fluorescence intensity after the addition of carbohydrate was used to calculate the binding constants of the Click fluor/saccharide complex. Also time resolved fluorescence was measured for glucose and fructose, The last topic was the linking of Click-fluor to poly(ethylene glycol), PEG, with glucose at the end of the chain, glc-PEG-glc.

The measurements show that the affinity of the Click-fluor for fructose is the greatest, on the other hand formation of the ester with glucose is very weak. Three strips were observed in the emission spectrum. One corresponds to the unbound probe, the second unstable ester form with sugar, and the third stable cyclic form of the sugar ester. In the time-resolved fluorescence of Click-fluor, changes in the wavelengths corresponding to the carbohydrate ester were seen, but not too pronounced. From the emission spectra of complex Click-fluor/glc-PEG-glc polymer and even lifetime fluorescence values, suggests that there is relatively strong binding of the probe to the glucose-modified polymer.

The main finding is that this probe is not suitable for detection of free glucose, but the binding to other studied carbohydrates was detected by stationary fluorescence spectroscopy.

Key words: phenylboronic acid, fluorescence, carbohydrates