# EnhaNcement of sensitivity in separation techniques with fluorescence detection using deuterated water

Josef Kučera1, Ondřej Peš2, Ivona Voráčová3, Petr Táborský1

*1Department of Chemistry, Faculty of Science, Masaryk University, Kotlářská 2, 611 37 Brno, Czech Republic*

*2Department of Biochemistry, Faculty of Medicine, Masaryk University, Kamenice 5, 62500 Brno, Czech Republic*

*3Department of Bioanalytical Instrumentation, Institute of Analytical Chemistry, Czech Academy of Sciences, Veveří 967/97, 60200 Brno, Czech Republic*

*Email of presenting author: 408285mail.muni.cz*

Fluorescent molecules with emission maxima above 500 nm are often dynamically quenched by OH oscillators present in water molecules. We have changed H2O for D2O to obtain higher fluorescence intensity signal. Our experiments carried out on spectrofluorometer have proved that anthracyclines can achieve about 300 % higher response in D2O as a solvent. The affect can be employed in various analytical methods including HPLC and capillary electrophoresis coupled to fluorescence detection. Fluorescence intensity in D2O based mobile phase of doxorubicin had increased about 2.87 times. An advantage of capillary electrophoresis compared to HPLC is the lower consumption of background electrolyte due to small volume of capillary. We achieved the separation of daunorubicin and epirubicin using capillary electrophoresis coupled with laser induced fluorescence detection (Ar+ laser 488 nm). The separation was carried out using borate buffer (105 mM, pH 9.0) prepared in H2O and D2O. We obtained 2.3 times larger peak area in buffer prepared in D2O. Changing normal water for deuterium water is a simple way to increase LODs in separation of anthracyclines, drugs used in cancer chemotherapy, by HPLC or CE coupled with fluorescence detection.