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MEETING ABSTRACTS

DETECTION OF ALZHEIMER'S DRUG CANDIDATE BY SURFACE-ENHANCED RAMAN SPECTROSCOPY

Jan Proska [1], Lucie Maresova [2], Marek Prochazka [3], Eugenie Nepovimova [1], Kamil Kuca [1]

[1] Department of Chemistry, Faculty of Science, University of Hradec Kralove, Rokitanského 62, 500 03 Hradec Kralove, Czech Republic
[2] Faculty of Nuclear Sciences and Physical Engineering, Technical University in Prague, Břehová 7, Prague 1 115 19, Czech Republic
[3] Charles University, Faculty of Mathematics and Physics, Institute of Physics, Ke Karlovu 5, Prague 2 121 16, Czech Republic

Drug candidate 1-EN-142 was designed and synthesized as a multipotent therapeutic agent to treat Alzheimer´s disease. In its molecule it combines tacrine moiety with naphthoquinone scaffold. For the study of centrally-active molecules in biological samples it is necessary to develop appropriate detection methodology that would determine such compounds in low concentration. Spectroscopy based on Surface-Enhanced Raman Scattering (SERS) was chosen as a comparative method for the electronic detection of compound 1-EN-142 by interdigitated impedance sensor decorated with gold nanoparticles. Since spectroscopic data were not available for this new drug candidate, it was necessary, as well, to acquire its classical Raman spectra in the solution and the solid state. SERS-active substrates were prepared by straightforward procedure so that 20 nm thick layer of gold was deposited by fast magnetron sputtering on silicon wafer. The substrates with roughened gold surface were immersed in solution of 1-EN-142 in methanol for 30 min and dried in the stream of nitrogen. SERS spectra of 1-EN-142 were obtained as an average of 100 spectra measured from an array of 20 x 5 points with 2 ≒m spacing. Subsequently, the reference spectrum, obtained by the same procedure from a SERS substrate unexposed to 1-EN-142, was subtracted, and the spectrum baseline was corrected using cubic splines. SERS spectra were recorded with a Raman microspectrometer using excitation wavelengths of 633 nm and 785 nm, respectively. Raman spectrum of 1-EN-142 solution in methanol in the range of 390 – 1741 cm^{-1} was collected with laser excitation of 532 nm. *SERS has* proved to be a suitable method of detecting compound 1-EN-142.

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