

NBD derived diphenyl(aminomethyl)phosphane : a new fluorescent dye for imaging of low pH regions and lipid membranes in living cells.

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Streszczenie

This work presents the comparative characterization (X-ray crystallography, NMR, solvatochromism and pH dependence of electronic absorption, steady-state and time resolved fluorescence properties) of a novel NBD based phosphane: 7-nitro-4-(4-(diphenylphosphinomethyl-piperazin-1-yl)-2,1,3-benzoxadiazole (**1**) and an analogous compound: 7-nitro-4-(4-methyl-piperazin-1-yl)-2,1,3-benzoxadiazole (**2**). Protonated forms of the compounds are highly luminescent, while the neutral ones are not. The pK_a values in water solutions are in the range 6.8–7.0 for **1** and 6.4–6.6 for **2**. However, we showed that these values do not reflect the luminescence properties in more complex environments, where other equilibria may occur. Performance of **1** and **2** as potential molecular probes for biological imaging of living cells was evaluated towards mammalian (HEK 293T) and fungal cells (two *Candida albicans* strains: CAF2-1 - parental strain, and DSY1050 - mutant with no functional *CDR1*, *CDR2* or *MDR1* genes). For the HEK 293T cells, both compounds showed an intracellular punctuated bright staining typical of acidic compartments (late endosomes/lysosomes), as confirmed by co-localization with LysoView 633. In *C. albicans* the fungal cells, **1** labeled both organelle and plasma membranes, with similar behavior in both strains. For **2** the results indicated a different intracellular localization and an export of **2** by the cells through MDR transporters. In conclusion, our studies show that **1** and **2** can be the efficient cellular stains. Moreover, we expect that **1** can be also successfully used as a transition metal complexes fluorescent label, being a substitute for PPh_3 or related phosphane ligands.

Słowa kluczowe

NBD fluorophore, Fluorescence imaging, Phosphine, Fluorescent label, *Candida albicans*, HEK 293T

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