



Fluorescent probe of rhodamide-fluorescein type for pH determination

Introduction:

Fluorescent probes of fluorescein and rhodamine type are often used in the study of various biological processes which are accompanied by change of intracellular pH. These biological processes can include nucleic acids, specific proteins, etc. Fluorescein provides intensive green fluorescence (excitation/emission 495/512 nm) at alkaline and neutral pH. On the other hand, rhodamine then exhibits intensive red fluorescence (excitation/emission 563/572 nm) at acidic pH. Direct connection of both indicators then allowed determination of change in fluorescence of fluorescein and rhodamine at two excitation/emission wavelengths. The ratio of intensities of fluorescent maxima is then linear in certain area of pH.

Technology description:

The rhodamine and fluorescein type indicators are popular especially due to their good biocompatibility and high sensitivity at physiological conditions. The potential of probes containing both fluorescein and rhodamine was shown in a system, where fluorescein and rhodamine were linked through a diethylamine linker. This compound was successfully used for pH determination in mitochondria. The developed indicator, composed of both fluorescein and rhodamine, has two excitation maxima- at 494 nm and 566 nm, exhibiting emission at 515 nm and 585 nm respectively. The ratio of emissions is dependent on change of pH and is linear in range of 6.6–7.8 pH.

Advantages over existing solutions:

- ▶ possibility of pH determination with high accuracy reaching the values 0.1 pH
- ▶ independence of measured values on the amount of indicator
- ▶ chemical stability
- ▶ ability to penetrate living cells

Currently, the main disadvantage of existing compounds is especially their complicated and time-consuming synthesis. The described system eliminates this factor by using solid phase synthesis, allowing the effective evaluation of the most suitable substrates.

Development status:

Prototype

IP protection:

CZ 30104

Ownership:

Institute of Molecular and Translational Medicine, Faculty of Medicine and Dentistry, Palacky University, Olomouc

Contact:

More information is available upon signing a CDA/NDA. Please contact IMTM's director (director@imtm.upol.cz) or the technology transfer office (tto@imtm.upol.cz)

