Research Tools

Fluorescent Assays with Improved Sensitivity

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of "locking" the fluorescence of a molecule.

Overview

Fluorescent molecules are essential tools for many scientific applications, including basic research, drug development, and disease diagnosis.

The Invention

UW-Madison researchers have developed a method of "locking" the fluorescence of a molecule such as rhodamine by linking its two amino groups to a "trimethyl lock." The lock can then be released through a user-designated interaction with a trigger.

In the trimethyl lock, strain from the steric interaction of three methyl groups forces the formation of a cyclic ester. The fluorescence of the locked rhodamine amide is negligible. But when this compound encounters a trigger molecule, such as an esterase or other enzyme, the bonds of the lock are cleaved to yield rhodamine, increasing the fluorescence 1000-fold. Optionally, the locked fluorescent compound can be conjugated to one or more additional molecules of interest. This invention allows the user to monitor enzymatic reactions and observe the precise movements of molecules.

Applications

- Tracking the movement of molecules in living cells
- Screening baggage

Key Benefits

- No fluorescence present until the substrate is exposed to the trigger
- Extremely sensitive
- Trimethyl lock rapidly activated
- Stable at room temperature for extended periods of time
- Easy to manufacture and use
- Other molecules, such as proteins, can be easily attached to the locked molecule
- Can be adapted to various triggers, including azides, which would be useful in screening baggage for explosives

Tech Fields

Biology and Technology Research

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854