Reagents for Bioreversible Protein Esterification

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WARF: P150262US03

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a potentially best-in-class diazo compound for esterification of biological molecules.

Overview

Chemoselective transformations are of key importance in modern chemical biology. Protein esterification can, for example, be employed for labeling, enhanced cellular uptake and other useful protein modifications. For this reason methods and reagents for selective esterification of carboxyl groups in proteins/polypeptides are of particular interest, especially if the reactions can be carried out in buffered aqueous solution and do not require a catalyst.

While there has been some success in this space, there remains a need for more efficient chemoselective esterification reagents for proteins and other biological molecules (e.g., nucleic acids) that result in high-yield, bioreversible ester formation. Such reagents should be synthetically amenable to modification with biologically useful entities.

The Invention

UW–Madison researchers have developed an optimized diazo compound, derived from phenylglycine amide, for converting carboxylate groups into an ester in high yield in buffered water. The ensuing esters are labile to esterase enzymes such as reside in all human cells, making the modification bioreversible. The novel compound is small, avoids deleterious side reactions and has a modularity that enables broad utility.

Applications

- Reagent market
- Potential biomedical utility; promoting cellular uptake of cargo molecules

Key Benefits

- Provides high esterification rates and yields
- Bioreversible
- Compound is novel, small and modular.
- Broad utility

Stage of Development

The novel compound ($R^1(R^2)C=N=N$) is markedly superior to other reagents in esterifying a model protein in a bioreversible manner. The R' group may be virtually any moiety, including ones that promote cellular uptake, cancer-cell targeting and enhanced pharmacokinetics (e.g., PEG). All of these moieties would be removed from the protein by cellular esterases.

Additional Information

Related Technologies

- For information about the researcher's ideal method for synthesizing diazo compounds, see WARF reference number P08318US02.

Related Intellectual Property

- View Divisional Patent in PDF format.

Tech Fields

- Drug Delivery : Other drug delivery technologies
- Research Tools : Protein interactions & function

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