

# Non-Perturbing, Targetable & Cleavable Protein Labeling Reagents

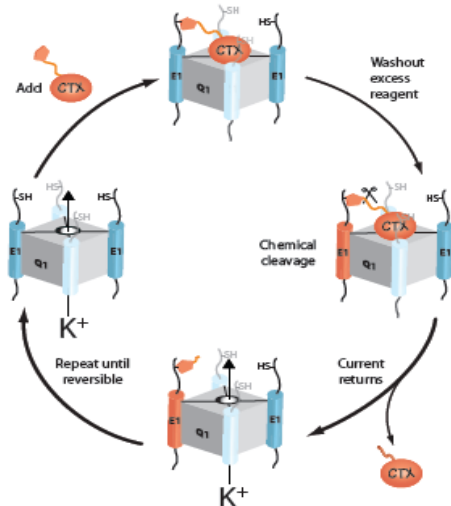
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US Patent pending

## Background

Cell surface labeling is a powerful tool used to localize, track, isolate, identify & analyze the structure, function & dynamics of membrane proteins. Labeling reagents find use in numerous research & diagnostics applications. None of the currently available reagents possess all the desired qualities. *Selective* and *specific* labeling *without* affecting protein *function* remains the most sought after property for a protein labeling reagent.

## Technology

UMass Medical School investigator Dr. William Kobertz & colleagues have developed novel labeling reagents that *selectively* & *specifically* transfer a chemical label to a cell surface protein *without affecting* the *function* of the protein. When fully assembled the targetable, cleavable protein labeling molecule consists of a *targeting* unit, a *linker* & a *chemical* tag. The targeting unit, that imparts selectivity to the tagging event, can be a protein, peptide or other molecules. The chemical tag can be a fluorophore, biotin or other molecular probes. Central to this technology is a **bifunctional** linker, **bis(N-phenylcarbamoyl)disulphane**, which can be rapidly **cleaved** with cell compatible reductants at **biological pH**. The power & utility of this technology was recently demonstrated in an elegant study (*Morin & Kobertz (2008) PNAS 105,1478*), wherein, the inventors used *Charybdotoxin (CTX)*, to target & transfer a tag selectively to the voltage gated K<sup>+</sup> ion channel without affecting the function of the protein. This facilitated structural & functional analysis of the Ion channel in its native state.



## Applications

Protein labeling reagents

## Salient Features and Competitive Advantages

- **Cleavable, Bifunctional Linker & Reductant:** This combination imparts **tag & release** capability to the targeting unit.
- **No Loss of Function:** The tag does not affect the function of the protein.
- **Biological pH Reaction:** The reactions for labeling the targeting unit & the transfer of the functional moiety, takes place at physiological pH, thereby, capturing & analyzing protein in its native state
- **Fast & Efficient Conjugation & Cleavage Reactions:** The transfer of the tag from CTX to the ion channel was complete in 3 minutes. The linear linker was rapidly cleaved (<2 min) with a cell compatible reagent.
- **Broad Applicability:** Because of the flexibility to use a fluorescent, biotin or other tags, the targetable, cleavable protein labeling molecules can be used in multiple applications including live cell imaging, protein isolation & identification by chromatography or mass spectrometry, sorting cells by FACS, HTS screening reagents etc.

## Business Opportunity

UMass OTM is seeking statements of interest from parties interested in licensing and/ or sponsoring collaborative research to commercialize this technology.

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