

the power of higher plexing

Thermo Scientific TMT10plex Reagents

Amine-reactive, 10-plex isobaric tag reagents. The Thermo Scientific™ Tandem Mass Tag™ Reagents are specially designed to enable identification and quantitation of proteins in different samples using tandem mass spectrometry (MS). Thermo Scientific™ TMT10plex™ Label Reagents share an identical structure with Thermo Scientific™ TMTzero™, TMTduplex™ and TMTsixplex™ Reagents but contain different numbers and combinations of ^{13}C and ^{15}N isotopes in the mass reporter. The different isotopes result in a 10-plex set of tags that have mass differences in the reporter that can be detected using high-resolution Thermo Scientific™ Orbitrap™ Mass Spectrometers.



Highlights:

- **Powerful** – concurrent MS analysis of multiple samples increases sample throughput and enables relative quantitation of up to 10 different samples derived from cells, tissues or biological fluids
- **Consistent** – identical reagent structure and performance among TMTzero, TMTduplex, TMTsixplex and TMT10plex Reagents allow efficient transition from method development to multiplex quantitation
- **Robust** – increased multiplex capability results in fewer missing quantitative values
- **Efficient** – amine-reactive, NHS-ester-activated reagents ensure efficient labeling of all peptides regardless of protein sequence or proteolytic enzyme specificity
- **Compatible** – optimized for use with high-resolution MS/MS platforms, such as Thermo Scientific™ Orbitrap™ Fusion™ Tribrid™, Orbitrap Velos Pro™, Orbitrap Elite and Q Exactive™ Instruments with data analysis fully supported by Thermo Scientific™ Proteome Discoverer™ 1.4 Software

Increased multiplex relative quantitation

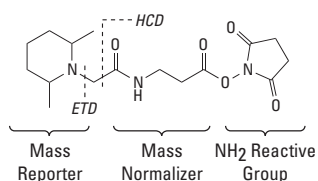
Advantages of the TMT10plex Reagents include increased multiplex relative quantitation, increased sample throughput and fewer missing quantitative values among samples. TMT10plex Reagents are ideal for the analysis of multiple protein samples from inhibitor dose response experiments, time course experiments or biological replicates.

The TMT10plex Reagent Set contains 10 different isobaric compounds with the same mass and chemical structure (i.e., isotopomeric) composed of an amine-reactive NHS-ester group, a spacer arm and a mass reporter. The reagent set enables up to 10 different peptide samples prepared from cells or tissues to be labeled in parallel and then combined for analysis. For each sample, a unique reporter mass (i.e., TMT¹⁰ Reagent that is 126-131Da) in the low-mass region of the high-resolution MS/MS spectrum is used to measure relative protein expression levels during peptide fragmentation and tandem mass spectrometry.

Applications:

- Protein identification and quantitation from multiple samples of cells, tissue or biological fluids
- Protein expression profiling of normal vs. disease states or control vs. treated
- Multiplex up to 10 different samples concurrently in a single experiment
- Quantitative analysis of proteins for which no antibodies are available
- Identification and quantitation of membrane and post-translationally modified proteins
- Identification and quantitation of hundreds to thousands of proteins in a single experiment

A. TMT Reagent Generic Chemical Structure



B. TMT10plex Reagents (TMT¹⁰)

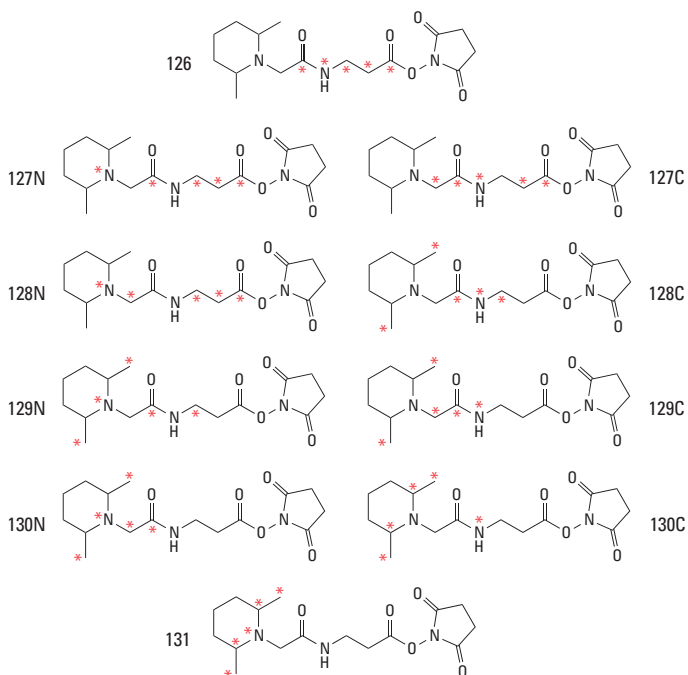


Figure 1. Structural design of the amine-reactive Thermo Scientific TMT10plex Reagents. **A.** Functional regions of the reagent structure including MS/MS fragmentation sites by higher energy collision dissociation (HCD) and electron transfer dissociation (ETD). **B.** TMT10plex Reagent structures with ¹³C and ¹⁵N heavy isotope positions (red asterisks).

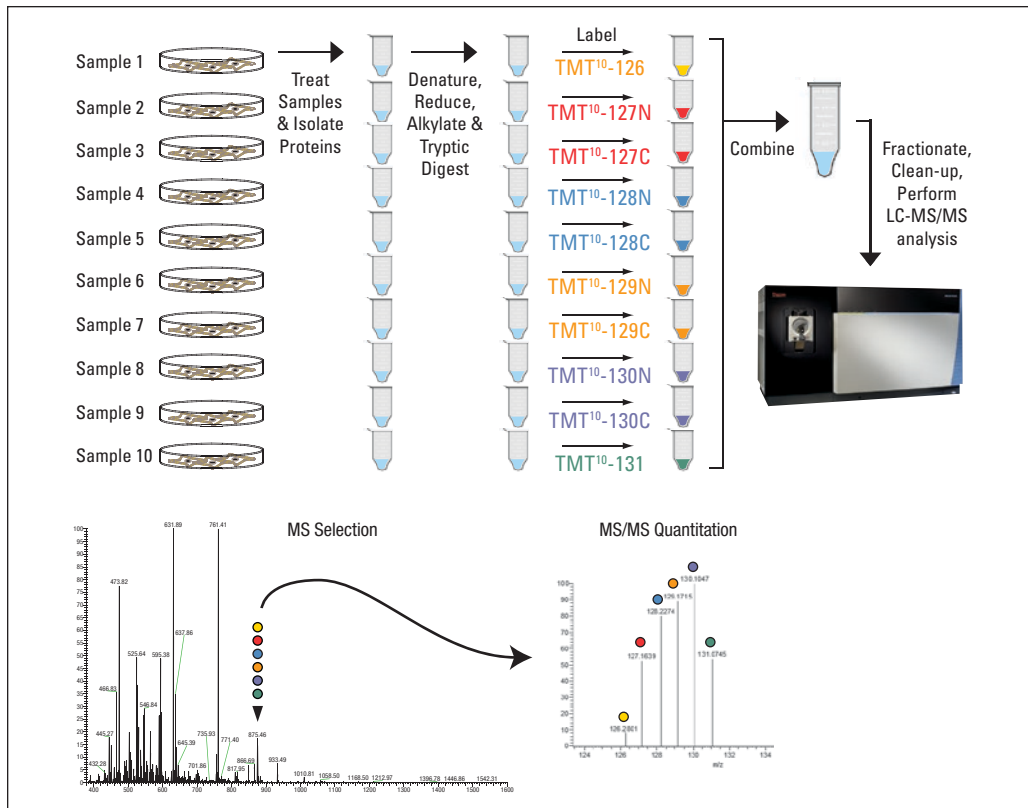


Figure 2. Procedure summary for MS experiments with Thermo Scientific TMT10plex Isobaric Mass Tagging Reagents. Protein extracts isolated from cells or tissues are reduced, alkylated and digested overnight. Samples are labeled with the TMT Reagents and then mixed before sample fractionation and clean up. Labeled samples are analyzed by high-resolution Orbitrap LC-MS/MS before data analysis to identify peptides and quantify reporter ion relative abundance.

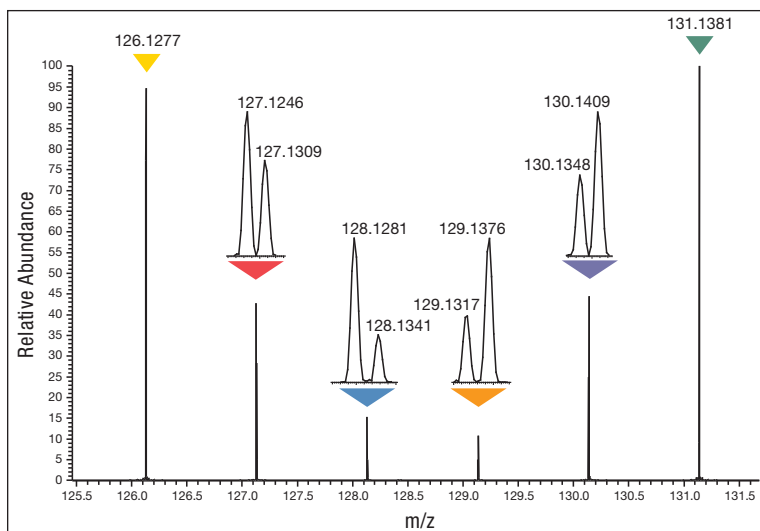


Figure 3. Example of 10-plex relative quantitation using Thermo Scientific TMT10plex Reagents. BSA tryptic digests labeled with TMT10plex Reagents (TMT¹⁰ Reagent that is 126-131Da) were mixed 16:8:4:2:1:1:2:4:8:16 and analyzed by high-resolution (Orbitrap LC-MS). The relative abundance of the target protein or peptide fragment in 10 different samples is easily measured by comparing the reporter ions generated by MS/MS fragmentation of the different mass tags.

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