



drug discovery. It helps researchers understand the impact of drug candidates on cellular proteomes, identify potential drug targets, and assess the efficacy of therapeutic interventions.

While isotope labeling has transformed quantitative proteomics, there are challenges that researchers continue to address. These

challenges include the need for improved data analysis tools, the development of more sensitive and specific labeling methods, and the integration of proteomics data with other omics data. Additionally, the high cost of isotope labeling and the complexity of the resulting data remain significant challenges. Despite these challenges, the continued development and application of isotope labeling in proteomics will undoubtedly lead to further breakthroughs in drug discovery and our understanding of cellular processes.