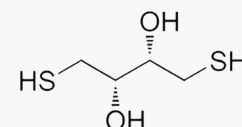




## DTT Applications

Dithiothreitol (DTT) is a key reagent in bioconjugation workflows, particularly for the preparation of Antibody–Drug Conjugates (ADCs) and Peptide–Drug Conjugates (PDCs). It efficiently generates thiols for cysteine–based conjugation and should be fully removed prior to coupling to avoid competitive quenching.



CAS No.: 3483-12-3

Application Area	Purpose / Role of DTT	Key References
Protein chemistry	Breaks disulfide bonds, unfolds proteins, assists in refolding	Cleland, W.W. Biochemistry (1964) – original DTT paper
Enzymology	Maintains cysteine residues in reduced state, preserves enzyme activity	Gilbert, H.F. Methods Enzymol. (1995)
Electrophoresis (SDS–PAGE)	Reduces disulfide bonds so proteins migrate as monomers	Laemmli, U.K. Nature (1970)
Western blotting	Ensures proteins remain in reduced, analyzable form	Towbin et al. PNAS (1979)
RNA/DNA work	Inhibits RNases, supports polymerase activity in PCR	Sambrook & Russell, Molecular Cloning (Cold Spring Harbor Manual, 2001)
Crystallography / NMR	Keeps proteins reduced for accurate structural studies	Otwinowski & Minor, Methods Enzymol. (1997)
Protein folding studies	Controls thiol–disulfide exchange in folding pathways	Anfinsen, C.B. Science (1973, Nobel lecture)
Cell biology	Protects against oxidative stress, used in redox signalling studies	Jones, D.P. FASEB J. (2008)
Thiol labelling	Reduces thiol groups prior to fluorescent/affinity tagging	Hermanson, G.T. Bioconjugate Techniques (3rd Ed., 2013)
Drug discovery assays	Maintains targets in active reduced state during screening	Inglese et al. Nature Chem. Biol. (2007)
Neurodegenerative research	Model compound for oxidative stress in Parkinson's/Alzheimer's studies	Kim et al. J. Biol. Chem. (2003)



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