TGM2/Transglutaminase 2 Protein, Human (sf9, His)

Cat. No.:	HY-P76114
Synonyms:	Protein-glutamine gamma-glutamyltransferase 2; Transglutaminase C; TGase-2
Species:	Human
Source:	Sf9 insect cells
Accession:	P21980-1 (M1-A687)
Gene ID:	7052
Molecular Weight:	Approximately 80 kDa

PROPERTIES

Biological Activity	The enzyme activity of this recombinant protein is testing in progress, we cannot offer a guarantee yet.
Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 μm filtered solution of 50 mM Tris, 100 mM NaCl, 2 mM DTT, 10% Glycerol, pH 8.0. Normally 5 % - 8 % trehalose, mannitol and 0.01% Tween 80 are added as protectants before lyophilization.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconsititution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH_2O.
Storage & Stability	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

DESCRIPTION

Background	Transglutaminase 2 (TGM2) is a calcium-dependent acyltransferase that facilitates the formation of covalent bonds between peptide-bound glutamine and various primary amines, leading to the cross-linking or amination of proteins. It plays a crucial role in diverse biological processes, including bone development, angiogenesis, wound healing, cellular differentiation, chromatin modification, and apoptosis. TGM2 acts as a protein-glutamine gamma-glutamyltransferase by mediating the cross-linking of various proteins involved in essential cellular functions. Under physiological conditions, its protein cross-linking activity is inhibited by GTP, with relief of inhibition in response to Ca(2+) during stress. When secreted, TGM2 catalyzes the cross-linking of extracellular matrix proteins, forming stable scaffolds. In apoptosis, TGM2 contributes to the condensation of the cytoplasm by promoting the cross-linking of cytoskeletal proteins and mediates the irreversible formation of scaffolds that stabilize dying cells before clearance by phagocytosis, preventing the leakage of harmful intracellular components. Additionally, TGM2 performs diverse protein post-translational modifications, including aminylation of serotonin, dopamine, noradrenaline, or histamine into glutamine residues, generating protein serotonylation, dopaminylation, noradrenalinylation, or histaminylation, respectively. It plays a key role in chromatin organization by mediating serotonylation and dopaminylation of histone H3. Moreover, TGM2 acts as a mediator of

neurotransmission-independent roles of nuclear dopamine in ventral tegmental area (VTA) neurons, regulating relapse-related transcriptional plasticity in the reward system. It also regulates vein remodeling by mediating serotonylation and subsequent inactivation of ATP2A2/SERCA2. Furthermore, TGM2 acts as a protein deamidase, converting specific glutamine residues to glutamate, and may function as an isopeptidase cleaving previously formed cross-links. It can also participate in signaling pathways independently of its acyltransferase activity, acting as a signal transducer in alpha-1 adrenergic receptor-mediated stimulation of phospholipase C-delta (PLCD) activity, and is required for coupling alpha-1 adrenergic agonists to the stimulation of phosphoinositide lipid metabolism. TGM2 exhibits cytotoxic activity, inducing apoptosis independently of its acyltransferase activity.

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