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Transglutaminase Kits

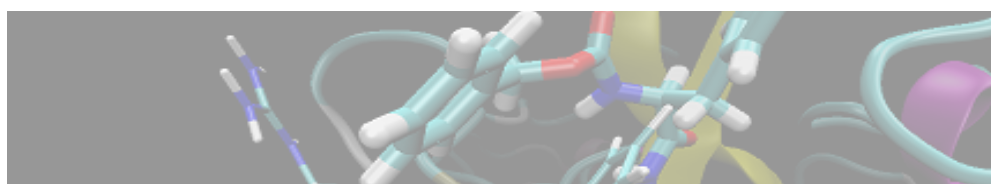
Reliable kits for
Transglutaminase
Research



14

Transglutaminases

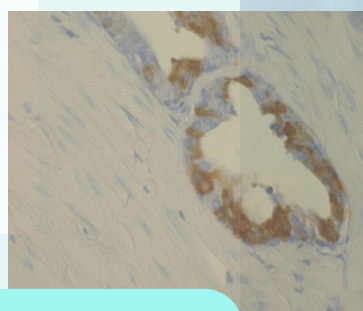
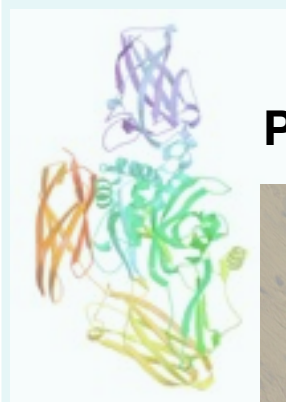
Antibodies, Proteins, Substrates, Inhibitors & Kits



Antibodies



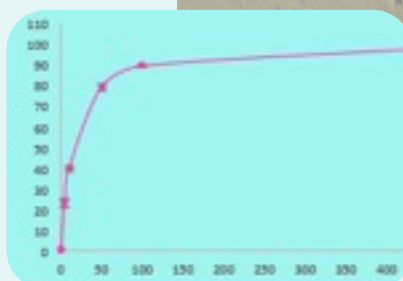
Proteins



Kits



Substrates



Inhibitors

Transglutaminases products (except kits p14)

| | Product Type | Catalog N° | Description |
|--------------|---------------|----------------|---|
| TG1 | Antibody | mab0139-P | Transglutaminase-1 antibody (8A7) |
| | | pab0060 | Transglutaminase-1 antibody |
| | | pab0060-P | Transglutaminase-1 antibody |
| | | pab0060-IP | Transglutaminase-1 antibody |
| | | pab0983-P | Transglutaminase-1 antibody |
| | Protein | opr0028 | human keratinocyte Transglutaminase (His6-rhTG1) recombinant (E.coli) |
| | TG substrates | opr0043-FITC | Peptide K5-[FITC] |
| | | opr0043-Biotin | Peptide K5-[Biotin] |
| TG2 | Antibody | mab0024-P | Transglutaminase-2 antibody (7D2) |
| | | pab0062 | Transglutaminase-2 antibody |
| | | pab0062-Biotin | Transglutaminase-2 antibody [Biotin] |
| | | pab0062-P | Transglutaminase-2 antibody |
| | | pab0062-IP | Transglutaminase-2 antibody |
| | | pab0024-P | Transglutaminase-2 antibody |
| | Protein | pab0024 | Transglutaminase-2 antibody |
| | | opr0027 | Recombinant human tissue Transglutaminase (His6-rhTG2) |
| | | opr0036 | Recombinant human TG2 |
| | TG inhibitors | opr0035 | Tissue Transglutaminase Inhibitor (Boc-DON-Gln-Ile-Val-OMe) |
| | | opr0041 | Tissue Transglutaminase Inhibitor (Z-DON-Val-Pro-Leu-OMe) |
| | TG substrates | opr0044-FITC | Peptide T26-[FITC] |
| | | opr0044-Biotin | Peptide T26-[Biotin] |
| TG3 | Antibody | mab0058-P | Transglutaminase-3 antibody (clone B5D) |
| | | mab0057-P | Transglutaminase-3 antibody (clone C2D) |
| | | mab0046-P | Transglutaminase-3 antibody (clone H3) |
| | | pab0064-IP | Transglutaminase-3 antibody |
| | | pab0064-P | Transglutaminase-3 antibody |
| | Protein | opr0029 | Recombinant human epidermal Transglutaminase (His6-rhTG3) |
| | TG substrates | opr0055-FITC | Peptide E51-[FITC] |
| | | opr0055-Biotin | Peptide E51-[Biotin] |
| TG4 | Antibody | mab0113-P | Transglutaminase-4 antibody (1C6) |
| | | pab0066-IP | Transglutaminase-4 antibody |
| | | pab0066 | Transglutaminase-4 antibody |
| | | pab0066-P | Transglutaminase-4 antibody |
| | Protein | opr0031 | Recombinant human keratinocyte Transglutaminase (His6-rhTG4) |
| TG5 | Antibody | pab0068 | Transglutaminase 5 antibody |
| | | pab0068-IP | Transglutaminase 5 antibody |
| | | pab0068-P | Transglutaminase 5 antibody |
| | Protein | opr0057 | Transglutaminase-5 (TG5) (hu) |
| TG6 | Antibody | pab90001-P | Transglutaminase-6 antibody |
| | | pab90001-FITC | Transglutaminase-6 antibody [FITC] |
| | Protein | opr0058 | Transglutaminase-6 (TG6) (hu) |
| TG7 | Antibody | pab0070 | Transglutaminase 7 antibody |
| | Protein | opr0032 | Transglutaminase 7 (TG7) (hu) |
| FXIII | Antibody | pab0058 | Plasmatic Transglutaminase 13 (FXIII) antibody |
| | | pab0058-IP | Plasmatic Transglutaminase 13 (FXIII) antibody |
| | Protein | opr0034 | Recombinant human Factor XIII (A subunit) (His6-rhFXIII) |
| | TG substrate | opr0056-Biotin | Peptide F11-[Biotin] |
| | TG inhibitors | opr0061 | K9-DON |
| | | opr0062 | Tridegin |
| Bacterial TG | Antibody | mab0031-P | Bacterial Transglutaminase antibody (3C7) |
| | | pab0676 | Bacterial Transglutaminase antibody |
| | Protein | opr0054 | Recombinant bacterial TG (mTG) |
| | TG substrate | opr0063 | Peptide mPep-[Biotin] |

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Transglutaminases

TG/Tgase - Transglutaminase

TG1 - Transglutaminase 1

TG2 - Transglutaminase 2

TG3 - Transglutaminase 3

TG4 - Transglutaminase 4

TG5 - Transglutaminase 5

TG6 - Transglutaminase 6

TG7 - Transglutaminase 7

FXIII - Factor XIII

mTG - Bacterial Transglutaminase

Applications

ELISA - Enzyme-linked

Immunosorbent Assay

IHC - Immunohistochemistry

IF - Immunofluorescence

IP - Immunopurification

FA - Functional assay

Species

Hu - Human

Ms - Mouse

G. Pig - Guinea Pig

E. coli - Escherichia coli

Str. - Streptomyces

Disease

AD - Alzheimer Disease

APP - Amyloid Precursor Protein

Aβ - Amyloid Beta

PD - Parkinson Disease

APSS - Peeling Skin Syndrome

Acral type

PSP - Progressive Supranuclear Palsy

PiD - Pick's disease

SCA35 - Spinocerebellar Ataxia Type 35

Signaling

NFκB - Nuclear Factor Kappa B

I-κB - Inhibitor of Kappa B

PL - Phospholipase

Transglutaminases

Introduced for the first time in 1957 by Clarke (1), the term Transglutaminase (Tgase) now refers to a class of enzymes which cross-link proteins and share in common their transamidating activity. Since this discovery, proteins showing Tgase activity have been found in micro-organisms, plants, invertebrates, amphibians, fish and birds (2).

Protein cross-links

Tgases catalyse a number of reactions leading to post-translational modification of proteins through acyl transfer reactions, involving peptidyl glutamine residues as acyl donors and a variety of primary amines as acyl acceptors with the generation of proteinase resistant isopeptide bonds (fig1.A).

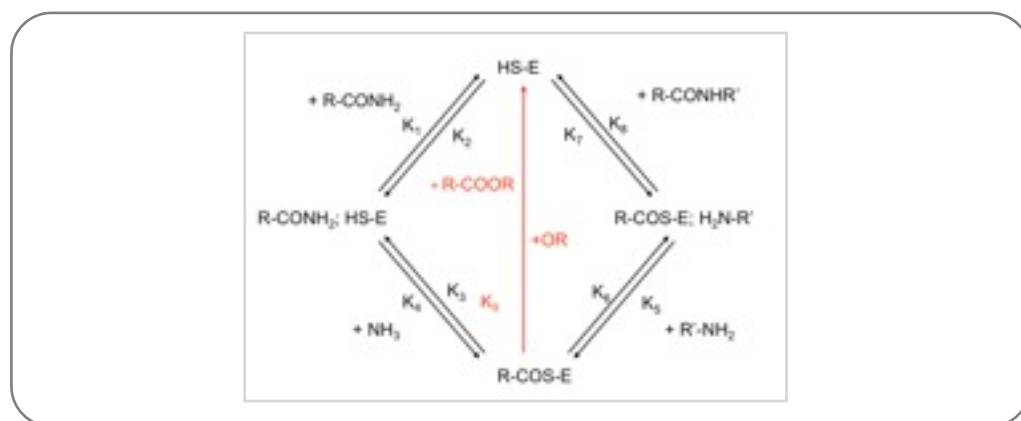


Figure 1a. Mechanism of TG2 activation (3) : transamidation, deamidation, esterification.

Tgases cross-link proteins through an acyl transfer reaction between the γ-carboxamide group of the peptide-bound glutamine and the ε-amino group of peptide-bound lysine, resulting in a ε-(γ-glutamyl) lysine isopeptide bond.

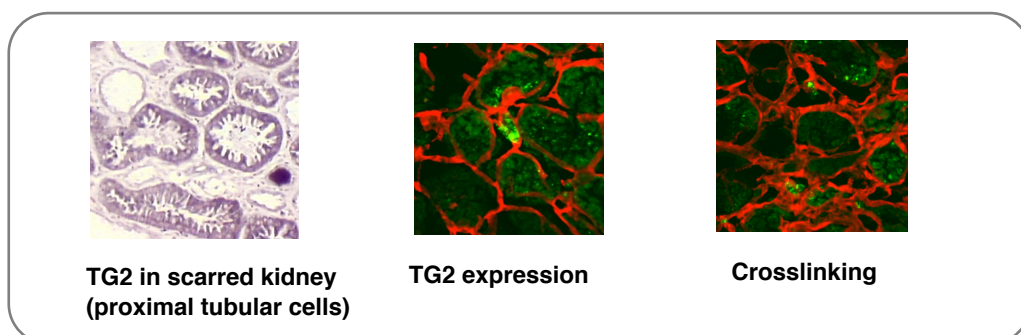


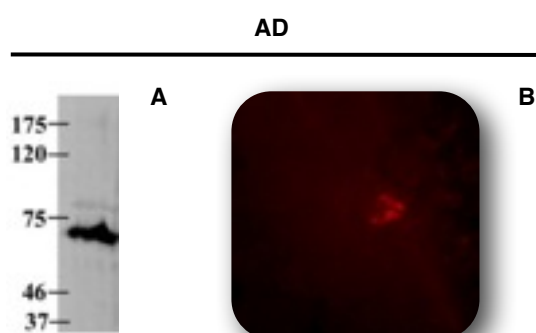
Figure 1b. Reaction catalysed by transglutaminase lead to proteins cross-link. Pictures derived from the publication of Johnson et al (4). ECM : Extracellular Matrix, with the courtesy of Dr T. Johnson & Pr Martin Griffin (4).

Cross-link & Neurodegeneration

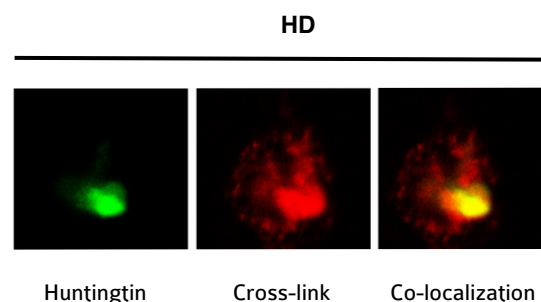
It is well known that Transglutaminase (TG) activity is significantly increased in the affected region of Alzheimer's disease (AD) brain. Tissue Transglutaminase can covalently cross-link neurofilament proteins ($A\beta$ (5), amyloid precursor protein (APP), tau and α -synuclein) into insoluble polymers in vitro by forming γ -glutamyl- ϵ -lysine intermolecular bridges (6) : targeting N(ϵ)(γ -glutamyl) lysine isopeptide is a good strategy to detect aggregates.

Special Highlight : Transglutaminases and neurodegenerative diseases

Transglutaminases (TGs) catalyze a variety of modifications of the carboxamide moiety of glutamine residues, including transamidation, deamidation and esterification (7). The activity of these enzymes are increased in a variety of neurodegenerative disorders such as Alzheimer's disease (AD), Parkinson's disease (PD) and Huntington's disease (HD). The brain expresses at least four of the eight active TGs produced by mammals. Even so, the only reaction attributed to cerebral TGs is transamidation. Of the possible reaction products, the γ -glutamyl- ϵ -lysine isopeptide linkage is the most commonly studied. This bond can be formed both within and between polypeptide chains (cross-links, see below) and may result in protein aggregation. Since the deposition of multimeric structures is a common feature of neurodegenerative disorders, the formation of γ -glutamyl- ϵ -lysine bonds has attracted much interest.



A. Western blot after immunoprecipitation of phosphorylated tau with anti-cross-link antibody (Covalab mAb0012, clone 81D4) (8). B. Fluorescence microscopy of cross-linked Tau protein detected with 81D4 antibody with the courtesy of Nancy A Muma.



Confocal Co-localization of Transglutaminase-catalyzed cross link and huntingtin protein in Huntington disease with the courtesy of Nancy A Muma.

Antibodies to N(ϵ -(γ -L-glutamyl)-L-lysine isopeptide

| Product | Raised in | Application | Catalog N° |
|---|-----------|-------------|------------|
| N(ϵ -(γ -L-glutamyl)-L-lysine isopeptide antibody (81D4) | Mouse | ELISA, IHC | mab0012-P |
| N(ϵ -(γ -L-glutamyl)-L-lysine isopeptide antibody (81D4)/ Agarose conjugate | Mouse | IP | opr0003 |
| N(ϵ -(γ -L-glutamyl)-L-lysine isopeptide antibody (81D4)/ Biotin conjugate | Mouse | ELISA | opr0046 |
| N(ϵ -(γ -L-glutamyl)-L-lysine isopeptide antibody (81D1C2) | Mouse | ELISA, IHC | mab0011-P |
| N(ϵ -(γ -L-glutamyl)-L-lysine isopeptide antibody (clone 71A3G4) | Mouse | ELISA, IHC | mab0009-P |

Transglutaminase family

In mammals, nine distinct Tgase isoenzymes have been identified but only six have been isolated and characterized at the protein level (2). As summarized in Table 1, the fully characterized enzymes include (a) the circulating zymogen Factor XIII, which is converted, by a thrombin-dependent proteolysis, into the active Tgase Factor XIIIa (plasma Tgase), involved in stabilization of fibrin clots and in wound healing; (b) the keratinocyte Tgase (type 1 Tgase) which exists in membrane-bound and soluble form, is activated several fold by proteolysis and is involved in the terminal differentiation of keratinocytes; (c) the ubiquitous tissue Tgase (tTgase; type 2 Tgase), whose role is still debated; (d) the epidermal/hair follicle Tgase (type 3 Tgase), which also requires proteolysis to become active and, like type 1, is involved in the terminal differentiation of the keratinocyte; (e) the prostatic secretory Tgase (type 4 Tgase), essential for fertility in rodents and (f) the recently characterized type 5 Tgase.

Table 1. The transglutaminase (Tgase family) (9).

| Tgase | Synonyms | Gene | Size aa (kDa) | Localisation | Function |
|-------------|------------------------------|-------|---------------|---|---|
| Factor XIII | Coagulation Factor XIII | F13A1 | 732 (83) | Cytosol, extracellular | Blood clotting and wound healing |
| Tgase-1 | Keratinocyte Tgase | TGM1 | 814 (90) | Cytosol, membrane | Cell envelope formation in the differentiation of keratinocytes |
| Tgase-2 | Tissue Tgase | TGM2 | 686 (80) | Cytosol, nucleus, membrane, cell surface, extracellular | Cell death and cell differentiation, matrix stabilization, adhesion protein |
| Tgase-3 | Epidermal Tgase | TGM3 | 692 (77) | Cytosol | Cell envelope formation during terminal differentiation of keratinocytes |
| Tgase-4 | Prostate Tgase | TGM4 | 683 (77) | Unknown | Reproductive function involving semen coagulation particularly in rodents |
| Tgase-5 | Tgase X | TGM5 | 719 (81) | Nuclear Matrix, cytoskeleton | Epidermal differentiation |
| Tgase-6 | Tgase Y | TGM6 | Unknown | Unknown | Not characterized |
| Tgase-7 | Tgase Z | TGM7 | 710 (80) | Unknown | Not characterized |
| Band 4.2 | Erythrocyte membrane protein | EPB42 | 690 (72) | Membrane | Structural protein in erythrocytes-no activity |

Transglutaminase 1

Transglutaminase 1 (TG1) is an enzyme that cross-links structural proteins in differentiating keratinocytes such as involucrin and loricrin to form a highly specialized protein structure, called a cornified envelop which contributes as a mechanical barrier to protect against water loss and infectious agents (10,11,12).

TG1 is normally expressed in the suprabasal cells of stratifying epithelia such as epidermis, the upper digestive tract, the female lower genital tract and in the endometrial epithelium late in pregnancy (13). It is also expressed as a result of squamous metaplasia in the trachea induced by vitamin A deprivation (14) and in a number of epithelial cell types, including those from bladder and endometrium (15).

Appropriate expression of the TGM1 gene is crucial for proper keratinocyte function as inactivating mutations lead to the debilitating skin disease, lamellar ichthyosis. An understanding of the regulation of this gene in normal and abnormal differentiation states may contribute to better disease diagnosis and treatment.

More recently Wilhelmus and coworkers (16) found that TG1-catalysed cross-linking might play an important role in the formation of neuronal tau inclusions in commonly known tauopathies such as progressive supranuclear palsy (PSP), frontotemporal dementia and parkinsonism linked to chromosome 17 (FTDP-17T) and Pick's disease (PiD) brain but not in NFTs (Neurofibrillary Tangles) of Alzheimer disease cases. This result open new insights in the role of TGase 1 in neurodegeneration.

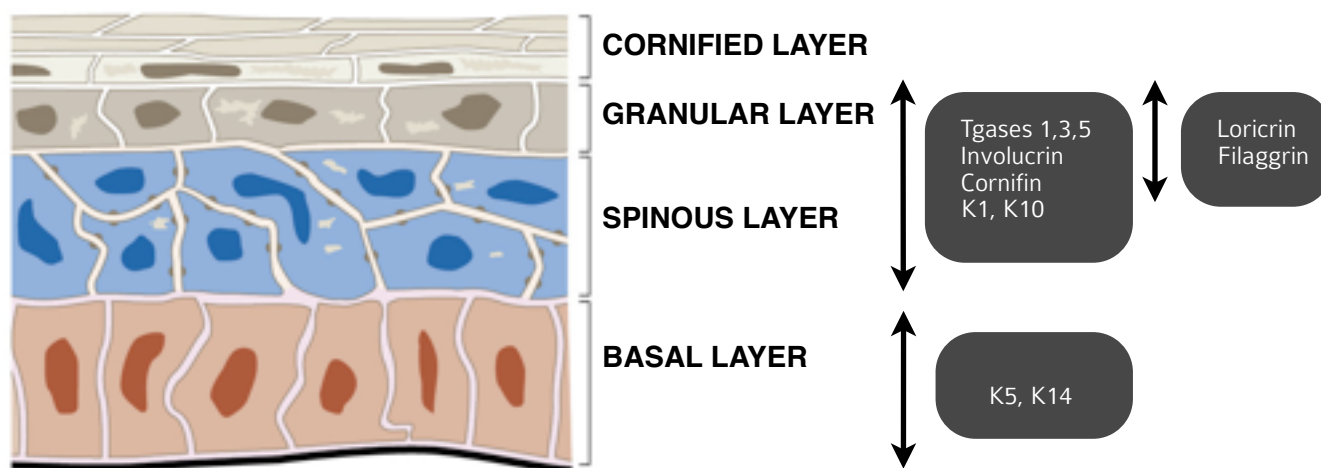
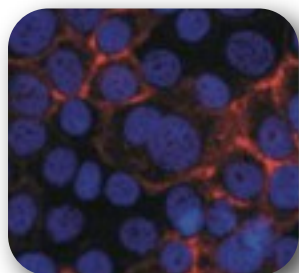


Figure 2. Keratinocyte differentiation (9). Keratinocytes begin in the basal layer as undifferentiated cells that have proliferative potential and express keratins 5 and 14. As they exit the basal layer, the daughter cells lose proliferative ability and give rise to differentiated cells comprising the spinous, granular, and cornified layers. Cornified envelope assembly begins in the late spinous layer and continues as the cells progress into the granular layer. The approximate range of expression of each protein is shown by the arrows. Transglutaminase (Tgase) 1, Tgase 3, and Tgase 5 are expressed in the spinous and granular layers along with the indicated envelope precursors (e.g., involucrin, cornifin), and keratins K1 and K10. The cornified envelope precursors, loricrin and filaggrin, are expressed later in differentiation. The rate of incorporation of envelope precursors and the deposition of covalent cross-links accelerates in the transition zone as the available level of free calcium increases and activates Tgase. Cross-linking in the transition zone finishes production of the cornified layer that comprises the dead protective epidermal surface.

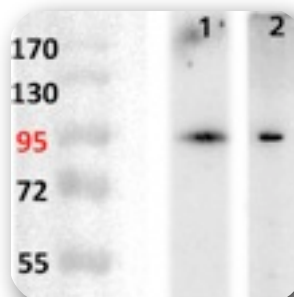
Antibodies

pab0060-P



IF analysis of Tgase 1 of human epidermal keratinocytes from neonatal foreskin using pab0060-P

mab0139-P



Anti-Tgase-1 antibody WB staining of (1) human saliva and (2) human recombinant Tgase-1.

| Product | Raised in | Species | Applications | Catalog N° |
|-----------------------------------|-----------|---------|----------------|------------|
| Transglutaminase-1 antibody (8A7) | Mouse | Hu | WB, IHC, ELISA | mab0139-P |
| Transglutaminase-1 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0060 |
| Transglutaminase-1 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0060-P |
| Transglutaminase-1 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0060-IP |
| Transglutaminase-1 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0983-P |

Proteins

| Product | Raised in | Species | Application | Catalog N° |
|--|-----------|---------|-------------|------------|
| Recombinant human keratinocyte Transglutaminase (His6-rhTG1) | E.coli | Hu | FA, IP | opr0028 |

Kits*

| Product | Content | Catalog N° |
|--|---|------------|
| Specific Keratinocyte Transglutaminase (TG1) Colorimetric Microassay Kit : TG1-CovTest | Measurement of Tgase-1 activity in biological samples | opr0038 |

TG substrates

| Product | Application | Catalog N° |
|---------------------|-------------------|----------------|
| Peptide K5-[FITC] | Tgase-1 substrate | opr0043-FITC |
| Peptide K5-[Biotin] | Tgase-1 substrate | opr0043-Biotin |

* : for supporting literature & more information see references 21 to 26 p15

Transglutaminase 2

Transglutaminase 2 (TG2) or tissue Transglutaminase (tTgase) is a highly versatile enzyme with multiple domain. In addition to being a transamidating enzyme, it has activities as a GTPase, a protein disulfide isomerase, a protein kinase, and an isopeptidase. Interestingly there is a switch between GTP and cross linking activity (17). That switch is under the control of calcium concentration : in the presence of adequate concentrations of calcium, TG2 cross-links substrate proteins, whereas when less calcium is available it acts as a G-protein. These multiple functions and regulations are important to its physiological role and may contribute to disease states.

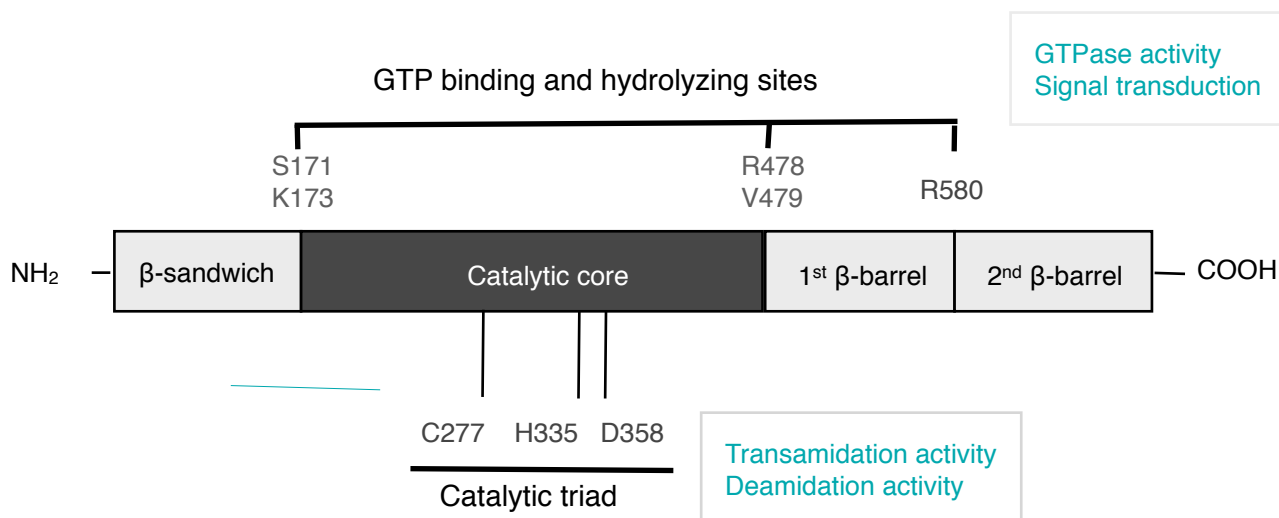


Figure 3a. Domains of human TG2 (17). Human TG2 comprise 4 domains : an N-Terminal β-sandwich domain, a catalytic core, and 2 C-terminal β-barrels. The catalytic triad necessary for transamidating activity is indicated, and consists of a Cys, His, and Asp. The regions of the protein necessary for GTP/GDP binding and GTP hydrolysis are located at the N-terminal of the catalytic core and at either end of the first β-barrel; amino acids believed to be important in these functions are indicated. the exact residues necessary for calcium binding are not fully known, but important regions within the catalytic core have been suggested based on sequence similarity with Factor XIII.

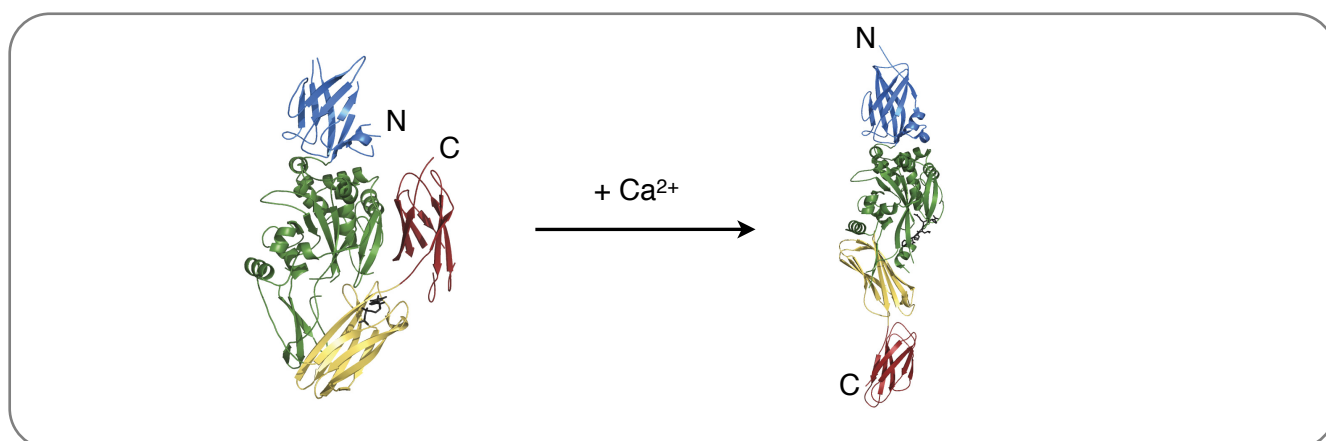


Figure 3b. Transglutaminase tertiary structure. Left : closed state of TG2. Right : open state of TG2.

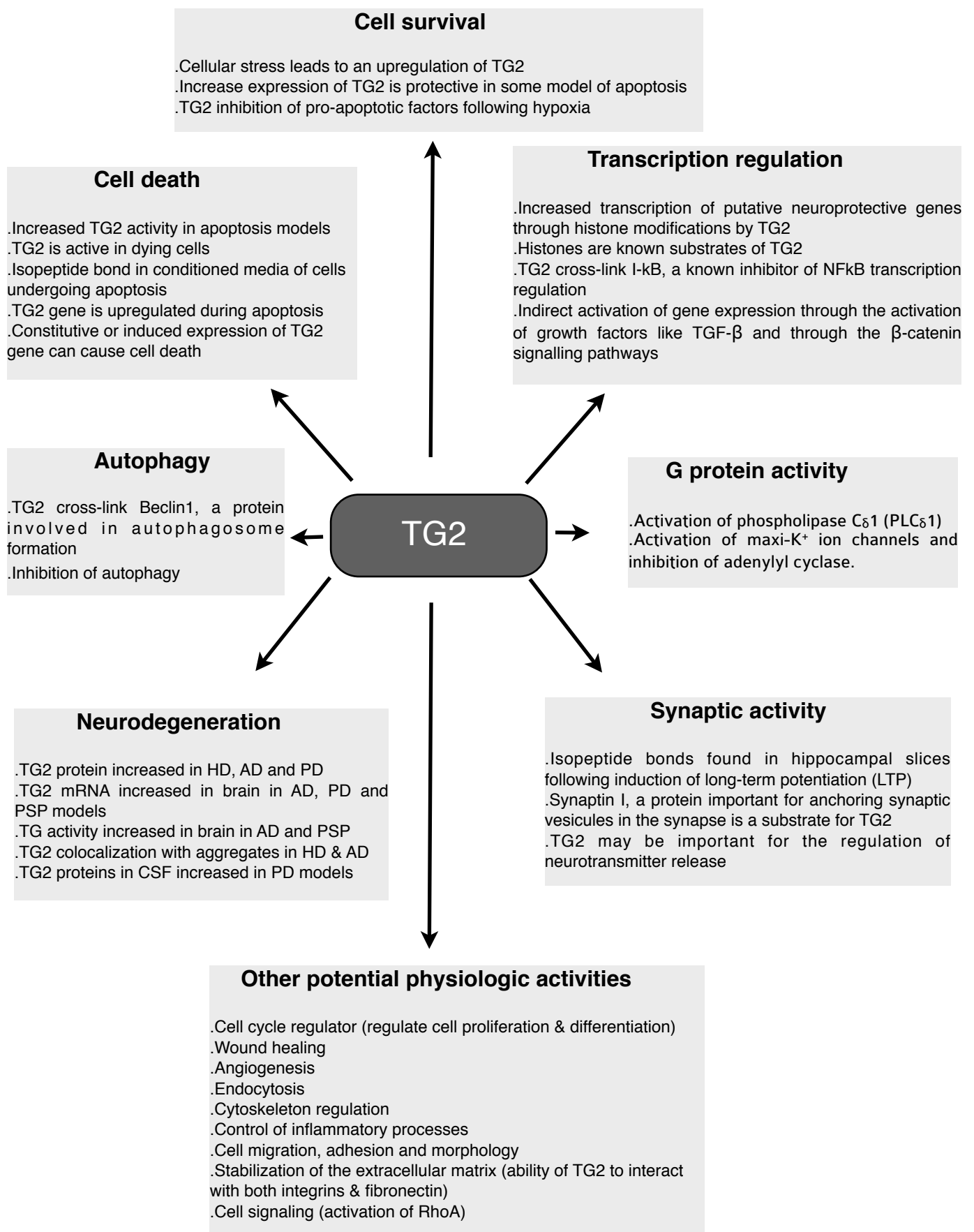
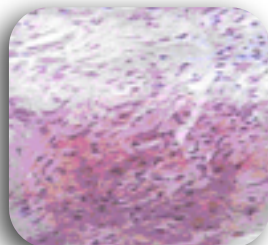


Figure 4. The various role and functions of TG2 (17). Schematic representation of physiologic roles of TG2. TG : Transglutaminase, HD : Huntington disease, AD ; Alzheimer disease, PD : Parkinson disease, PSP : Progressive Supranuclear Palsy.

Antibodies

pab0024



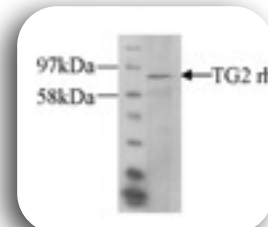
IHC analysis of human liver using pab0024

mab0024-P



Western blot analysis of human erythrocytes using mab0024-P

pab0062-P



Western blot analysis of human recombinant TG2 using pab0062-P

| Product | Raised in | Species | Applications | Catalog N° |
|--------------------------------------|-----------|--------------------|----------------|----------------|
| Transglutaminase-2 antibody (7D2) | Mouse | Hu, G pig | ELISA, IHC, WB | mab0024-P |
| Transglutaminase-2 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0062 |
| Transglutaminase-2 antibody [Biotin] | Rabbit | Hu | ELISA, WB | pab0062-Biotin |
| Transglutaminase-2 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0062-P |
| Transglutaminase-2 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0062-IP |
| Transglutaminase-2 antibody | Rabbit | Hu, Ms, Rat, G pig | ELISA, IHC, WB | pab0024-P |
| Transglutaminase-2 antibody | Rabbit | Hu, Ms, Rat, G pig | ELISA, IHC, WB | pab0024 |

Proteins

| Product | Raised in | Species | Application | Catalog N° |
|--|-----------|---------|-------------|------------|
| Recombinant human tissue Transglutaminase (His6-rhTG2) | E.coli | Hu | FA, IP | opr0027 |
| Recombinant human TG2 | E.coli | Hu | FA, IP | opr0036 |

Kits*

| Product | Content | Catalog N° |
|--|--|------------|
| Specific Tissue Transglutaminase (tTG/TGase2) Colorimetric Microassay Kit : TG2 Cov Test | Measurement of Tgase-2 activity in biological samples | opr0030 |
| Transglutaminase-2 ELISA Kit | Immunodetection of Tgase-2 protein in biological samples | kit0001 |

TG inhibitors and substrates

| Product | Application | Catalog N° |
|---|---|----------------|
| Tissue Transglutaminase Inhibitor (Boc-DON-Gln-Ile-Val-OMe) | Irreversible inhibitor of Tgase-2 ; IC ~ 0,3µM | opr0035 |
| Tissue Transglutaminase Inhibitor (Z-DON-Val-Pro-Leu-OMe) | Irreversible inhibitor of Tgase-2 ; IC ~ 0,02µM. Cell permeable at 40µM | opr0041 |
| Peptide T26-[FITC] | Tgase-2 substrate | opr0044-FITC |
| Peptide T26-[Biotin] | Tgase-2 substrate | opr0044-Biotin |

* : for supporting literature & more information see references 21 to 26 p15

Transglutaminase 3

Transglutaminase 3 (TG3), also known as epidermal Transglutaminase (Tgase E) is involved in the formation of the cornified envelope (CE) in skin keratinocytes (18). It functions to cross-link structural proteins during epidermal terminal differentiation : in that process, TG3 catalyzes crosslinking of small proline-rich proteins (SPRR1 and SPRR2) and LOR (Loricrin) proteins to form small interchain oligomers, which are further cross-linked by TG1 onto the growing CE scaffold. In hair follicles, TG3 is involved in cross-linking structural proteins to hardening the inner root sheath.

TG3 activation requires proteolysis of the 77 kDa zymogen into two fragments of approximately 50 and 27 kDa to form the active enzyme. TG3 has been implicated as the dominant autoantigen in dermatitis herpetiformis.

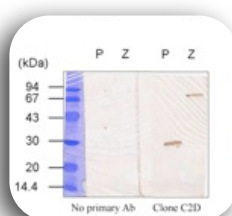
Antibodies

mab0058-P (B5D)



Western blot analysis of TG3 (proteolyzed forms 47 and 30 kDa (lane 1)) and 77 kDa zymogen form (lane 2)) using mab0058-P with the courtesy of Pr Hitomi(19-20)

mab0057-P (C2D)



Western blot analysis of TG3 (P : proteolyzed forms 47 and 30 kDa (lane 1)) and 77 kDa zymogen form (Z, lane 2)) using mab0057-P with the courtesy of Pr Hitomi



IHC analysis of TG3 in human foreskin using mab0057-P with the courtesy of Pr Hitomi

| Product | Raised in | Species | Application | Catalog N° |
|---|-----------|---------|----------------|------------|
| Transglutaminase-3 antibody (clone B5D) | Mouse | Hu | ELISA, WB, IHC | mab0058-P |
| Transglutaminase-3 antibody (clone C2D) | Mouse | Hu | ELISA, WB, IHC | mab0057-P |
| Transglutaminase-3 antibody (clone H3) | Mouse | Hu | ELISA, WB, IHC | mab0046-P |
| Transglutaminase-3 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0064-IP |
| Transglutaminase-3 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0064-P |

Proteins

| Product | Raised in | Species | Application | Catalog N° |
|---------------------------------------|-----------|---------|-------------|------------|
| Epidermal Transglutaminase (TG3) (hu) | E.coli | Hu | FA, IP | opr0029 |

Kits * and TG substrates

| Product | Application | Catalog N° |
|---|---|----------------|
| Specific Epidermal Transglutaminase (TGase3) Colorimetric Microassay Kit : TG3 Cov Test | Measurement of Tgase-3 activity in biological samples | opr0051 |
| Peptide E51-[FITC] | Tgase-3 substrate | opr0055-FITC |
| Peptide E51-[Biotin] | Tgase-3 substrate | opr0055-Biotin |

* : for supporting literature & more information see references 21 to 26 p15

Transglutaminase 4

Transglutaminase 4 (TG4) belongs to the papain-like family of transglutaminases. TG4 is a unique member of the family due basically to its distribution pattern in the body in that it is mainly found in the prostate gland and exists only at low levels in other tissues types.

TG4 is associated with the mammalian reproductive process and catalyzes the cross-linking of proteins and the conjugation of polyamines to specific proteins in the seminal tract.

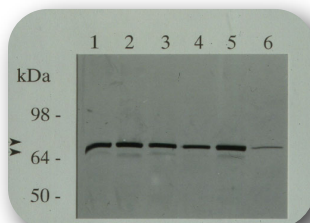
Antibodies

mab0113-P



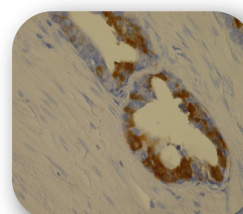
Western blot analysis of yeast extracts expressing (1)TG4, (2)TG1, (3)TG2, (4)TG3, (5) FXIII using mab0113-P

pab0066-P



Western blot analysis of prostatic fluids using pab0066-P

pab0066-IP



IHC analysis of prostatic tissue using pab0066-IP

| Product | Raised in | Species | Application | Catalog N° |
|-----------------------------------|-----------|---------|----------------|------------|
| Transglutaminase-4 antibody (1C6) | Mouse | Hu | ELISA, IHC, WB | mab0113-P |
| Transglutaminase-4 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0066-IP |
| Transglutaminase-4 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0066 |
| Transglutaminase-4 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0066-P |

Proteins

| Product | Raised in | Species | Application | Catalog N° |
|--------------------------------------|-----------|---------|-------------|------------|
| Prostate Transglutaminase (TG4) (hu) | E.coli | Hu | FA, IP | opr0031 |

Transglutaminase 5

Transglutaminase 5 (TG5) contributes to the formation of the cornified cell envelope of keratinocytes. Defects in TG5 are a cause of peeling skin syndrome acral type (APSS).

Antibodies & Proteins

| Product | Raised in | Species | Application | Catalog N° |
|-------------------------------|-----------|---------|----------------|------------|
| Transglutaminase-5 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0068-P |
| Transglutaminase-5 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0068-IP |
| Transglutaminase-5 antibody | Rabbit | Hu | ELISA, IHC, WB | pab0068 |
| Transglutaminase-5 (TG5) (hu) | E.Coli | Hu | FA | opr0057 |

Transglutaminase 6

Defects in TG6 are the cause of spinocerebellar ataxia type 35 (SCA35), a kind of cerebellar disorder. Patients show progressive incoordination of gait and often poor coordination of hands, speech and eye movements, due to degeneration of the cerebellum with variable involvement of the brainstem and spinal cord. SCA35 patients commonly show upper limb involvement and torticollis. There is no cognitive impairment.

Antibodies and Proteins

| Product | Raised in | Species | Application | Catalog N° |
|------------------------------------|-----------|---------|-------------|---------------|
| Transglutaminase-6 antibody | Rabbit | Hu | WB | pab90001-P |
| Transglutaminase-6 antibody [FITC] | Rabbit | Hu | WB | pab90001-FITC |
| Transglutaminase-6 (TG6) (hu) | Insect | Hu | FA | opr0058 |

Kits*

| Product | Content | Catalog N° |
|---|---|------------|
| Specific Transglutaminase-6 (Tgase-6) Colorimetric Microassay Kit : TG6-CovTest | Measurement of Tgase-6 activity in biological samples | opr0060 |

Transglutaminase 7

Transglutaminase 7 (TG7), encoded by the TGM7 gene, is also known as protein-glutamine-glutamyltransferase Z (Tgase Z). It belongs to the family of transglutaminases that catalyze the posttranslational modification of proteins via calcium dependent cross-linking reactions. TG7 is ubiquitously expressed in humans. Members of the TGM family have been implicated in a variety of human diseases including neurodegenerative diseases, celiac disease, lamellar ichthyosis, bleeding disorders, cataract formation, atherosclerosis, and others.

Antibodies & Proteins

| Product | Raised in | Species | Application | Catalog N° |
|-------------------------------|-----------|---------|-------------|------------|
| Transglutaminase-7 antibody | Rabbit | Hu | ELISA, WB | pab0070 |
| Transglutaminase-7 (TG7) (hu) | E.coli | Hu | FA, IP | opr0032 |

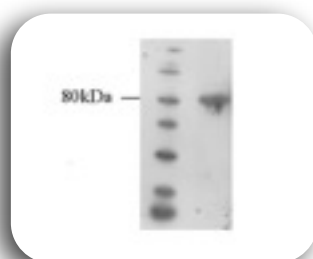
* : for supporting literature & more information see references 21 to 26 p15

Factor XIII

Transglutaminase Factor XIII is a transglutaminase that circulates in the plasma as a heterotetramer of two catalytic A subunits and two carrier B subunits. When thrombin has converted fibrinogen to fibrin, the latter forms a proteinaceous network in which every E-unit is crosslinked to only one D-unit. Factor XIII is activated by thrombin into factor XIIIa; its activation into Factor XIIIa requires calcium as a cofactor. A cleavage by thrombin between residue Arg37 and Gly38 on the N-terminus of the A subunit, leads to the release of the activation peptide (MW 4000 da). In the presence of calcium the carrier subunits dissociate from the catalytic subunits, leading to a 3D change in conformation of factor XIII and hence the exposure of catalytic cysteine residue. Upon activation by thrombin, factor XIIIa acts on fibrin to form γ -glutamyl- ϵ -lysyl amide cross links between fibrin molecules to form an insoluble clot.

Antibodies

pab0058



Western blot analysis of human plasma using pab0058 antibody

| Product | Raised in | Species | Application | Catalog N° |
|--|-----------|---------|----------------|------------|
| Plasmatic Transglutaminase 13 (FXIII) antibody | Rabbit | Hu | ELISA, IHC, WB | pab0058 |
| Plasmatic Transglutaminase 13 (FXIII) antibody | Rabbit | Hu | ELISA, IHC, WB | pab0058-IP |

Proteins

| Product | Raised in | Species | Application | Catalog N° |
|--|--------------|---------|-------------|------------|
| Recombinant human Factor XIII (A subunit) (His6-rhFXIII) | Insect cells | Hu | FA | opr0034 |

Kits*

| Product | Content | Catalog N° |
|--|---------------------------------------|------------|
| Specific Plasmatic Transglutaminase (Factor XIII/ FXIII) Colorimetric Microassay Kit : FXIII-CovTest | Measurement of FXIII in blood samples | opr0037 |

TG inhibitors and substrate

| Product | Application | Catalog N° |
|----------------------|-----------------------|----------------|
| Peptide F11-[Biotin] | Factor XII substrate | opr0056-Biotin |
| K9-DON | Factor XIII Inhibitor | opr0061 |
| Tridegin | Factor XIII Inhibitor | opr0062 |

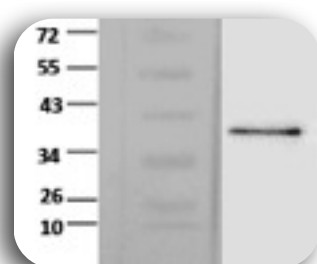
* : for supporting litterature & more information see references 21 to 26 p15

Bacterial Transglutaminase

Microbial/Bacterial transglutaminase (mTG) has been isolated from the culture medium of *Streptovercillium mobaraense*. It is produced as prepro-enzyme consisting of 406 amino acid residues and converted to active form consisting of 331 amino acids with a molecular mass of 37.9 kDa by an extracellular protease. In contrast to other transglutaminases, only a single cysteine was determined, located at the active site. No activity regulation mechanism for the Ca^{2+} -independent microbial/bacterial Tgase has been described until now. The enzyme has been applied in the treatment of food of different origins like whey proteins, soya proteins, wheat proteins, beef myosin, casein and crude actomysin refined from mechanically deboned poultry meat. Food treated with microbial transglutaminase appeared to have an improved flavour, appearance and texture. In addition, this enzyme can increase shelf-life and reduce allergenicity of certain foods.

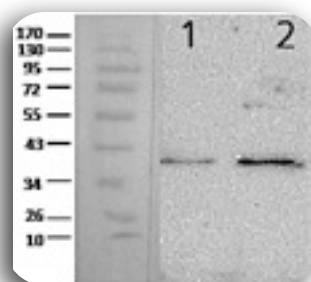
Antibodies

mab0031



Western blot analysis of 50 ng of recombinant mTG (opr0054) using mab0031-P antibody

pab0676



Western blot analysis of (1) 50 ng or (2) 100 ng of recombinant mTG (opr0054) using pab0676 antibody

| Product | Raised in | Species | Application | Catalog N° |
|---|-----------|---------|----------------|------------|
| Bacterial Transglutaminase antibody (3C7) | Mouse | Str. | ELISA, WB | mab0031-P |
| Bacterial Transglutaminase antibody | Rabbit | Str. | ELISA, IHC, WB | pab0676 |

Proteins

| Product | Produced in | Applications | Catalog N° |
|----------------------------------|-------------|--------------|------------|
| Bacterial Transglutaminase (mTG) | E. Coli | FA | opr0054 |

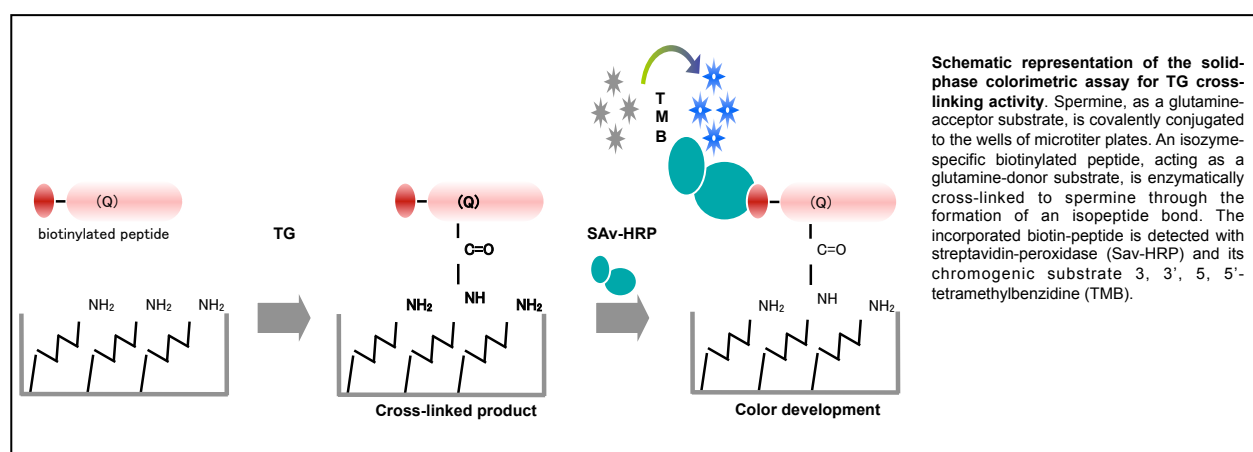
Kits* and substrate

| Product | Content | Catalog N° |
|--|---|------------|
| Specific Microbial /Bacterial Transglutaminase (mTG) Colorimetric Microassay Kit : mTG-CovTest | Measurement of mTG activity in biological samples | opr0053 |
| Peptide mPep-[Biotin] | mTG substrate | opr0063 |

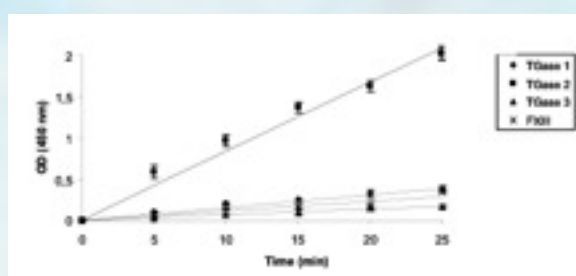
* : for supporting literature & more information see references 21 to 26 p15

Transglutaminase Kits

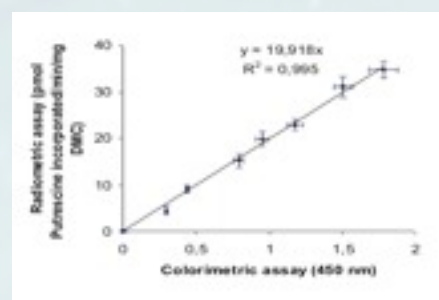
Covalab provides kits with **high sensitivity and specificity** for the screening of Transglutaminases activities. Achieve quality data with the power of ELISA testing : repeatable results, sensitivity, flexibility and high throughput screening.



| | Catalog N° | Name |
|------------------------|------------|--|
| TGs | opr0001 | Transglutaminase Colorimetric MicroAssay Kit (quantification of transglutaminase activity) |
| TG1 ⁽²¹⁻²⁷⁾ | opr0038 | Specific Keratinocyte Transglutaminase (TG1) Colorimetric Microassay Kit : TG1-CovTest |
| TG2 | opr0030 | Specific Tissue Transglutaminase (tTG/Tgase2) Colorimetric Microassay Kit : TG2 Cov Test |
| | kit0001 | Transglutaminase-2 ELISA kit |
| TG3 | opr0051 | Specific Epidermal Transglutaminase (Tgase-3) Colorimetric Microassay Kit : TG3-CovTest |
| TG6 | opr0060 | Specific Transglutaminase-6 (Tgase-6) Colorimetric Microassay Kit : TG6-CovTest |
| FXIII | opr0037 | Specific Plasmatic Transglutaminase (Factor XIII/ FXIII) Colorimetric Microassay Kit : FXIII-CovTest |
| mTG | opr0053 | Specific Microbial/Bacterial Transglutaminase (mTG) Colorimetric Microassay Kit : mTG-CovTest |



Assay specificity for TG2 (TG2-CovTest : opr0030)



Assay specificity Correlation of the colorimetric TG2-CovTest with Standard Radiometric TG Assays opr0030)

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Recent publications related to Transglutaminases with Covalab's products

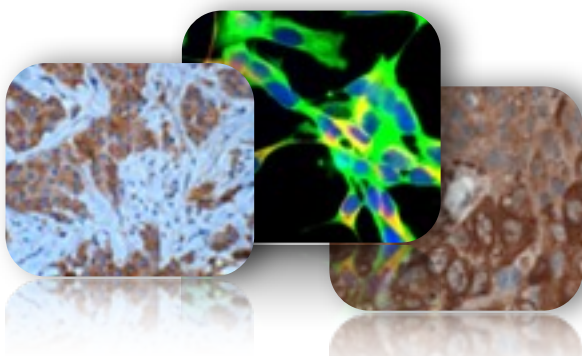
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Notes

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