

ER STRESS PRODUCT FOCUS

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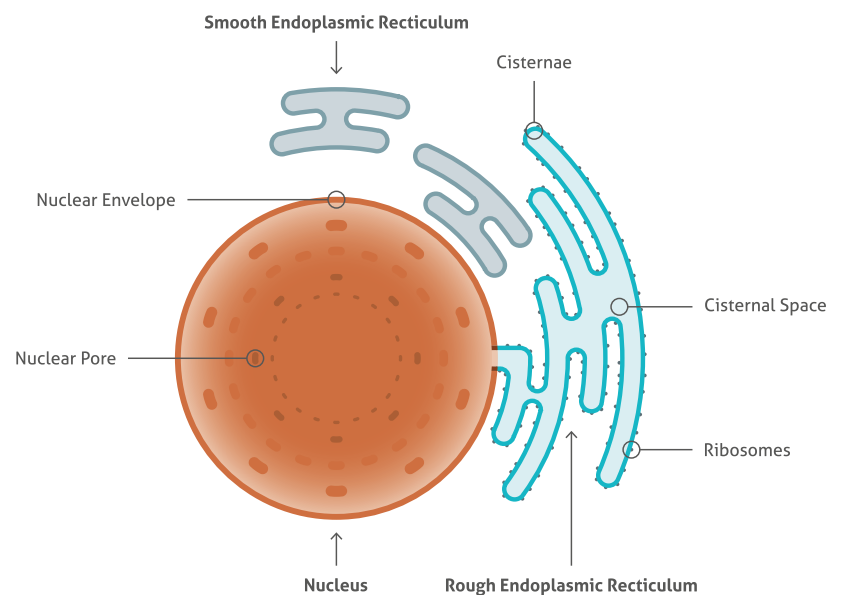
Introduction

The endoplasmic reticulum (ER) is a cellular organelle responsible for lipid or steroid synthesis, folding or maturation of proteins, calcium storage, and detoxification.

The ER consists of a membrane network of cisternae that goes through the cytoplasm and is in continuous connection with the nuclear envelope. The ER consists of two different regions that differ in their structure and function. The rough ER contains ribosomes attached to the cytoplasmic side of the membrane. The rough ER is mainly responsible for protein synthesis, while the smooth ER is lacking in ribosomes and functions as a storage for key enzymes and their products.

Cellular processes that lead to misfolding of proteins in the endoplasmic reticulum lead to ER stress and consequently to the activation of several signaling pathways named the unfolded protein response (UPR). ER stress has been shown to be connected to different neurodegenerative diseases, such as Parkinson's or Alzheimer's disease, inflammation, and cancer.

Endoplasmic Reticulum



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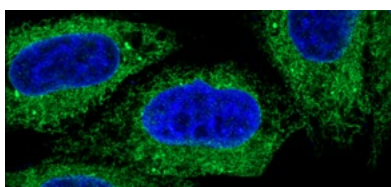
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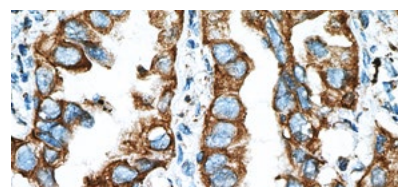
Most Popular Endoplasmic Reticulum Markers

Antibody Name	Catalog Number	Type	Applications
ERp57/Erp60	9 15967-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, IP, WB
ERp72	4 14712-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
GRP94	6 14700-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, IP, WB
PDI	7 11245-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, IP, WB
TAP1	5 11114-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB

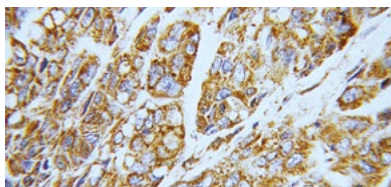
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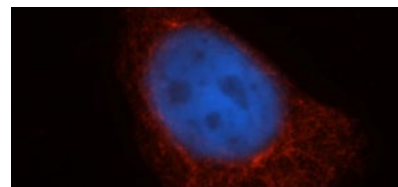
Immunofluorescence staining of fixed HepG2 cells (10% Formaldehyde) using ERp57/Erp60 antibody (15967-1-AP) at a dilution of 1:50 and goat anti-rabbit IgG(H+L) Alexa Fluor 488-conjugated secondary antibody.



Immunohistochemical staining of paraffin-embedded human lung cancer using ERp57/Erp60 antibody (15967-1-AP) at a dilution of 1:100 (40x objective).



Immunohistochemical staining of paraffin-embedded human lung cancer using ERp72 antibody (14712-1-AP) at a dilution of 1:100 (40x objective).



Immunofluorescence staining of HepG2 cells using TAP1 antibody (11114-1-AP) at a dilution of 1:50 and goat anti-rabbit IgG rhodamine-labeled (red). Blue pseudocolor = DAPI (fluorescent DNA dye).

ER Stress In Neurodegenerative Diseases

ER stress is mainly caused by disturbance of the calcium homeostasis and accumulation of misfolded proteins. The ER responds by changing its protein profile, altering its cellular signalling and degradation of misfolded proteins. ER stress has been reported to be involved in different neurodegenerative diseases such as Alzheimer's or Parkinson's. To date, the exact mechanism and contribution of ER stress to these diseases remain unknown. Elucidation of the involvement of ER stress in neurodegeneration might help in the development of new neuroprotective therapies.

Most Popular Neurodegenerative-Related Markers

Antibody Name	Catalog Number	Type	Applications
AKT1	19 10176-2-AP	Rabbit Poly	ELISA, FC, IHC, IP, WB
alpha-synuclein	5 10842-1-AP	Rabbit Poly	ELISA, IF, IHC, WB
Amyloid beta	60342-1-Ig	Mouse Mono	ELISA, IHC, WB
PARK7, DJ-1	3 11681-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB

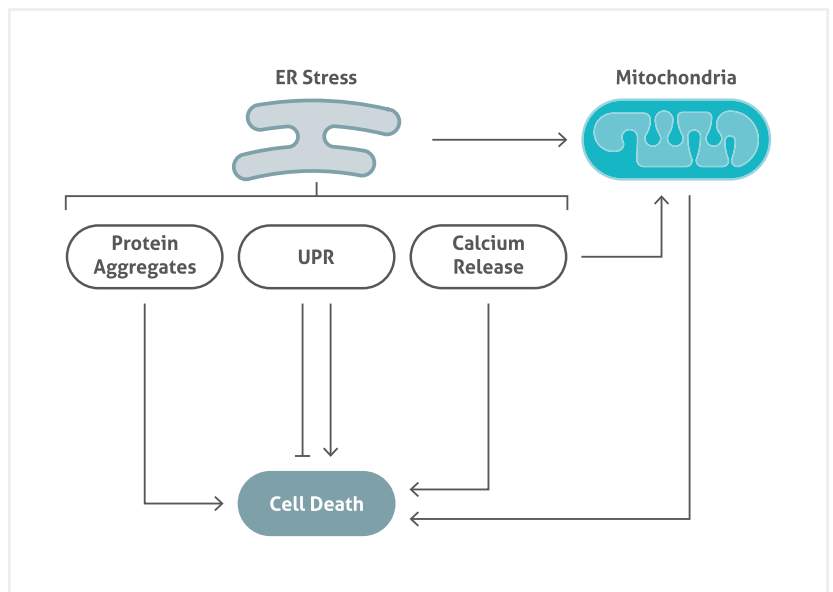
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Most Popular Neurodegenerative-Related Markers *Continued*

Antibody Name	Catalog Number	Type	Applications
Tau	2 10274-1-AP	Rabbit Poly	ELISA, IHC, WB
TDP-43	744 10782-2-AP	Rabbit Poly	CoIP, ChIP, ELISA, FC, IF, IHC, IP, RIP, WB

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ER Stress & Neurodegenerative Diseases



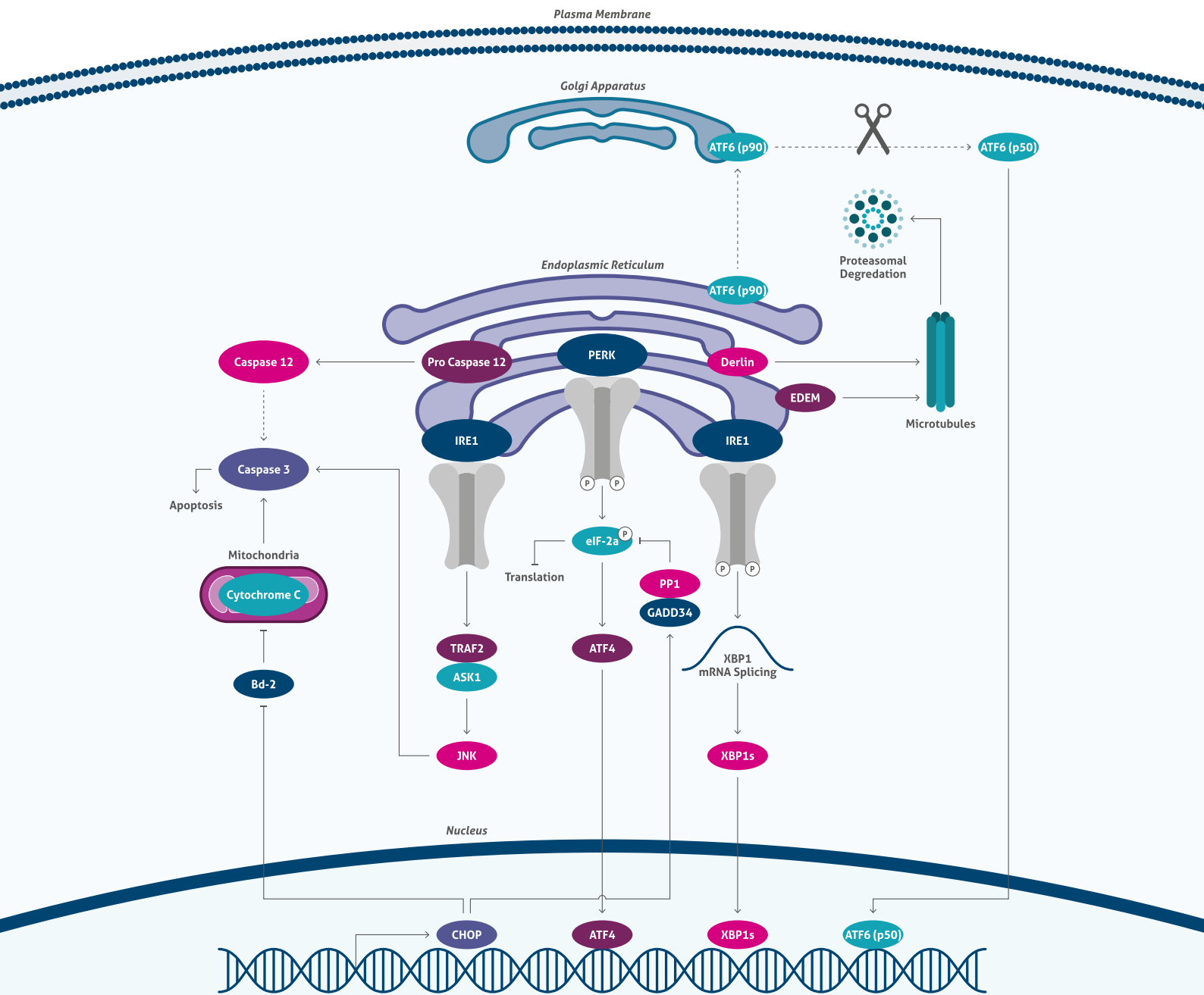
Endoplasmic Reticulum Stress

Disruption of the endoplasmic reticulum homeostasis leads to an accumulation of misfolded or unfolded proteins. This stage is called ER stress. ER stress is responsible for the activation of multiple signaling pathways, named the unfolded protein response (UPR). ER stress mainly induces cell dysfunction and cell death. Better understanding of ER stress and related UPR will help to elucidate new targets for ER stress-related diseases.

Related Antibodies

Antibody Name	Catalog Number	Type	Applications
ASK1	1 14385-1-AP	Rabbit Poly	ELISA, WB
ATF4	37 10835-1-AP	Rabbit Poly	ELISA, FC, IHC, IP, WB
BCL-XL	139 12789-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, IP, WB
Calnexin	11 10427-2-AP	Rabbit Poly	ELISA, FC, IF, IHC, WB
Caspase3	93 19677-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
Caspase12	7 55238-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
Cytochrome C	66264-1-Ig	Mouse Mono	ELISA, IF, IHC, WB
JNK	18 51151-1-AP	Rabbit Poly	ELISA, IF, IP, WB
XBP1	1 25997-1-AP	Rabbit Poly	ELISA, IHC, WB

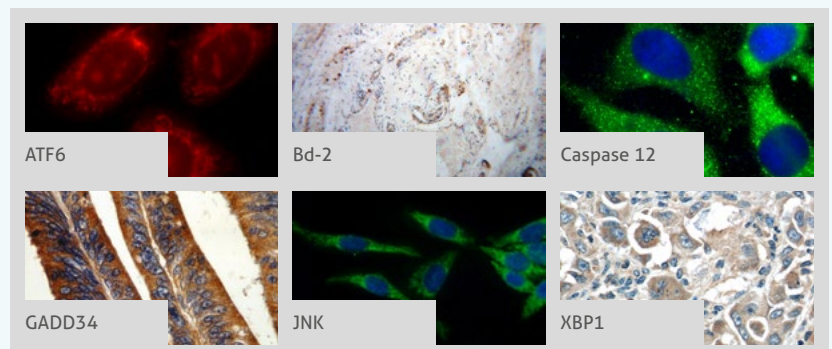
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ER Stress Pathway

Legend

→	Directly Activates
- - - - ->	Indirectly Activates
⊣	Inhibits
(P)	Phosphorylates



PRODUCT FOCUS

CHOP

Catalog Number
15204-1-AP

Type
Rabbit Polyclonal

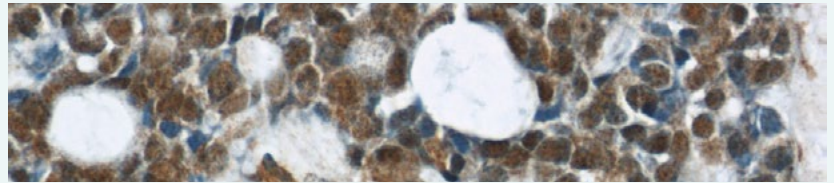
Applications
ELISA, FC, IHC, WB

36 Publications

KD/KO Validated

CHOP, also known as GADD153 or DDIT3, is a highly conserved gene in both the structural and regulatory regions of the hamster gene. Activated in response to unfolded and misfolded proteins, CHOP is significantly induced by ER stress. CHOP deficiency prevents ER stress in cells. CHOP

is considered a pro-apoptotic marker of ER stress-dependent cell death. It acts as a dominant-negative inhibitor of the transcription factor C/EBP and LAP by forming a heterodimer. It may also play an important role in the malignant transformation of nevi to melanoma.



Immunohistochemical staining of paraffin-embedded human cervical cancer using CHOP antibody (15204-1-AP) at a dilution of 1:50 (40x objective).

GRP78

Catalog Number
11587-1-AP

Type
Rabbit Polyclonal

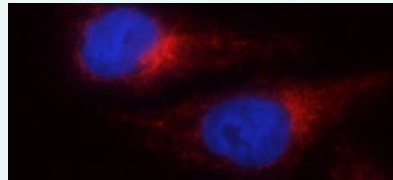
Applications
ELISA, FC, IF, IHC, IP, WB

47 Publications

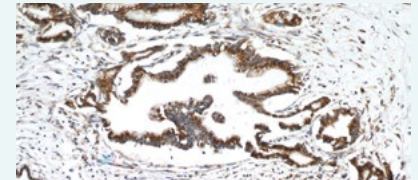
KD/KO Validated

GRP78 (HSPA5), also referred to as 'immunoglobulin heavy chain-binding protein' (BiP), is a member of the heat-shock protein-70 (HSP70) family and is involved in the folding and assembly of proteins in the endoplasmic

reticulum (ER). It is a constitutively expressed resident protein of the ER in all eukaryotic cells. Recently it has been reported that GRP78 is associated with apoptosis or inhibition of cancer cell growth.



Immunofluorescence staining of HepG2 cells using GRP78 antibody (11587-1-AP) at a dilution of 1:25 and goat anti-rabbit IgG rhodamine-labelled secondary antibody.



Immunohistochemical staining of paraffin-embedded human breast cancer using GRP78 antibody (11587-1-AP) at a dilution of 1:50 (10x objective).

PERK

Catalog Number
24390-1-AP

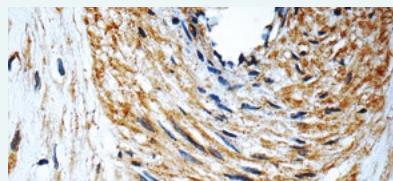
Type
Rabbit Polyclonal

Applications
ELISA, IF, IHC, WB

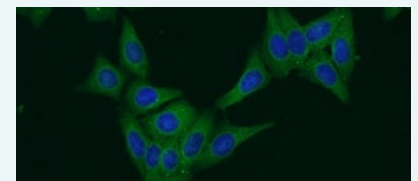
1 Publication

PERK is also known as PEK, EIF2AK3 (Eukaryotic translation initiation factor 2-alpha kinase 3), and belongs to the GCN2 subfamily. It potentially acts as a metabolic sensor in the insulin-secreting beta-cells to modulate the trafficking and quality control of proinsulin

in the ER relative to the physiological demands for circulating insulin. PERK and EIF2AK3 also have a functional role in regulating translation under non-stressed conditions, in addition to their long-established roles as stress kinases.



Immunohistochemical staining of paraffin-embedded human placenta slide using PERK antibody (24390-1-AP) at a dilution of 1:50.



Immunofluorescence staining of HepG2 cells using PERK antibody (24390-1-AP) at a dilution of 1:50 and goat anti-rabbit IgG(H+L) Alexa Fluor 488-conjugated secondary antibody.

PRODUCT FOCUS

ATF6

Catalog Number
24169-1-AP

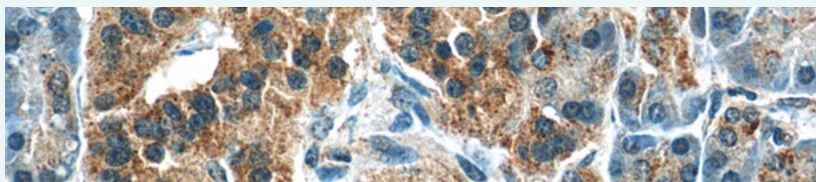
Type
Rabbit Polyclonal

Applications
ELISA, IF, IHC, IP, WB

11 Publications

Activating Transcription Factor 6 (ATF6), as the name suggests, is a transcription factor. It increases the expression of unfolded protein response target genes in response to ER stress. It binds DNA on the 5'-CCAC[GA]-3' half of the ER stress response element (ERSE) (5'-CCAAT-N(9)-CCAC[GA]-3') and of ERSE II (5'-ATTGG-N-CCACG-3'). During unfolded protein response an approximative 50 kDa fragment containing the cytoplasmic transcription factor domain is released by proteolysis. The cleavage seems

to be performed sequentially by site-1 and site-2 proteases. The fully glycosylated form of ATF6, a 670 amino acid protein, exhibits an electrophoretic mobility of ~90 kDa in denaturing SDS-gels, in part because of the glycosylated modifications. ATF6 has 3 consensus sites for N-linked glycosylation and exists constitutively as a glycosylated protein. Differentially glycosylated ATF6 forms may result from mutations or experimental treatment.



Immunohistochemical staining of paraffin-embedded human pancreas tissue slide using ATF6 antibody (24169-1-AP) at a dilution of 1:50 (40x objective).

More Endoplasmic Reticulum-Related Markers

Antibodies specific for proteins of the endoplasmic reticulum serve to provide more detailed understanding of the molecular mechanisms regulating ER stress and to elucidate the roles of proteins related to several diseases.

Antibody Name	Catalog Number	Type	Applications
APP	60342-1-Ig	Mouse Mono	ELISA, IHC, WB
BCHE	23854-1-AP	Rabbit Poly	ELISA, IF, IHC, WB
CALR	7 10292-1-AP	Rabbit Poly	ELISA, IF, IHC, WB
DLG4	1 20665-1-AP	Rabbit Poly	ELISA, IHC, IP, WB
HMOX1	30 10701-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
HMOX2	2 14817-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
HSPA1A	5 10995-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, IP, WB
IFNG	13 15365-1-AP	Rabbit Poly	ELISA, IF, IHC, WB
P4HB	7 11245-1-AP	Rabbit Poly	ELISA, FC, IF, IHC, IP, WB
PDIA4	4 14712-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
SERCA2	1 13985-1-AP	Rabbit Poly	ELISA, WB
TAP1	5 11114-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB
UGGT1	14170-1-AP	Rabbit Poly	ELISA, IHC, IP, WB
VCP	2 10736-1-AP	Rabbit Poly	ELISA, IF, IHC, IP, WB

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