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.
THE BENCHMARK IN VALIDATION

Proteintech take complete responsibility for every product they manufacture and ensure that it will work in your hands with an extensive validation process.

Here’s what you can expect:

- Every antibody has been extensively validated by the in-house team in a wide range of applications.
- Antibodies now tested in siRNA knockdown to demonstrate specificity.
- Original validation data available to researcher on request.
- Multi-lingual technical support available online and by email.

www.ptglab.com
**Most Popular Endoplasmic Reticulum Markers**

<table>
<thead>
<tr>
<th>Antibody Name</th>
<th>Catalog Number</th>
<th>Type</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERp57/ERp60</td>
<td>15967-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, FC, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>ERp72</td>
<td>14712-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>GRP94</td>
<td>14700-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, FC, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>PDI</td>
<td>11245-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, FC, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>TAP1</td>
<td>11114-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
</tbody>
</table>

This number shows the amount of times our antibody has been cited in a publication.

**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**

<table>
<thead>
<tr>
<th>Antibody Name</th>
<th>Catalog Number</th>
<th>Type</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKT1</td>
<td>10176-2-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, FC, IHC, IP, WB</td>
</tr>
<tr>
<td>alpha-synuclein</td>
<td>10842-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, WB</td>
</tr>
<tr>
<td>Amyloid beta</td>
<td>60342-1-lg</td>
<td>Mouse Mono</td>
<td>ELISA, IHC, WB</td>
</tr>
<tr>
<td>PARK7, DJ-1</td>
<td>11681-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
</tbody>
</table>

This number shows the amount of times our antibody has been cited in a publication.
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.
ER Stress Pathway

Legend
- Directly Activates
- Indirectly Activates
- Inhibits
- Phosphorylates

ATF6
GADD34
Bcl-2
JNK
Caspase 12
XBP1

Gene expression
Endoplasmic Reticulum
DNA replication
Mitochondria
Nucleus

GADD34
3MC
Bcl-2
Caspase 12
KIB1
PRODUCT FOCUS

CHOP
Catalog Number 15204-1-AP
Type Rabbit Polyclonal
Applications ELISA, FC, IHC, WB

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.

GRP78
Catalog Number 11587-1-AP
Type Rabbit Polyclonal
Applications ELISA, FC, IF, IHC, IP, WB

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.

PERK
Catalog Number 24390-1-AP
Type Rabbit Polyclonal
Applications ELISA, IF, IHC, WB

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.
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’-CCAT-N(9)-CCAC[GA]-3’) and of ERSE II (5’-ATTGG-N-CCACG-3’). During unfolded protein response an approximate 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).

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.

<table>
<thead>
<tr>
<th>Antibody Name</th>
<th>Catalog Number</th>
<th>Type</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>APP</td>
<td>60342-1-lg</td>
<td>Mouse Mono</td>
<td>ELISA, IHC, WB</td>
</tr>
<tr>
<td>BCHE</td>
<td>23854-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, WB</td>
</tr>
<tr>
<td>CALR</td>
<td>10292-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, WB</td>
</tr>
<tr>
<td>DLG4</td>
<td>20665-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IHC, IP, WB</td>
</tr>
<tr>
<td>HMOX1</td>
<td>10701-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>HMOX2</td>
<td>14817-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>HSPA1A</td>
<td>10995-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, FC, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>IFNG</td>
<td>15365-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, WB</td>
</tr>
<tr>
<td>P4HB</td>
<td>11245-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, FC, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>PDIA4</td>
<td>14712-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>SERCA2</td>
<td>13985-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, WB</td>
</tr>
<tr>
<td>TAP1</td>
<td>11114-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
<tr>
<td>UGGT1</td>
<td>14170-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IHC, IP, WB</td>
</tr>
<tr>
<td>VCP</td>
<td>10736-1-AP</td>
<td>Rabbit Poly</td>
<td>ELISA, IF, IHC, IP, WB</td>
</tr>
</tbody>
</table>

This number shows the amount of times our antibody has been cited in a publication.
CONTACT US

Proteintech Group
US Head Office

PHONE 1 (888) 4PTGLAB
(1-888-478-4522)
(toll free in USA),
or 1 (312) 455-8498
(outside USA)

FAX 1 (312) 455-8408

ADDRESS Proteintech Group, Inc.
5400 Pearl Street, Suite 300,
Rosemont, IL 60018, USA

EMAIL proteintech@ptglab.com

Proteintech Europe
United Kingdom

PHONE +44 (161) 8393007

FAX +44 (161) 2321272

ADDRESS Proteintech Europe, Ltd.
4th Floor,
196 Deansgate,
Manchester, M3 3WF

EMAIL europe@ptglab.com

Proteintech Europe
Germany

EMAIL germany@ptglab.com
Sales and technical support only.

Proteintech China Office

PHONE 027-87531629
or 4006-900-926

FAX 027-87531627

ADDRESS Wuhan Sanying Biotechnologies
D3-3, No.666 Gaoxin Avenue,
Wuhan East Lake Hi-tech Development Zone
Wuhan, Hubei, P.R.C

EMAIL service@ptglab.com

Support
Available 24 hours via Live Chat and 9-5
(CDT) via phone.
Email support also available.

LIVE CHAT www.ptglab.com
TWITTER @proteintech
BLOG blog.ptglab.com
YOUTUBE www.youtube.com/Proteintech

We are ISO 9001 and
ISO 13485 accredited.