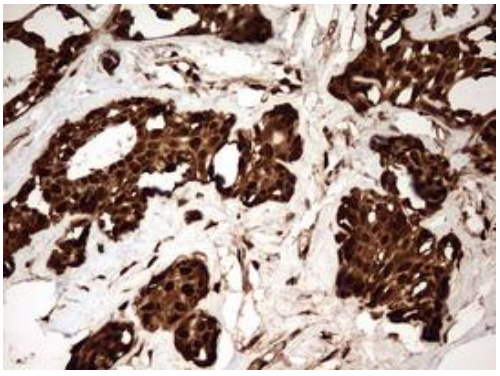
Huntington´s Disease

Huntington's disease (HD) is a fatal neurodegenerative disorder which usually occurs in mid-age.
It is characterized by psychiatric disorders, involuntary movements and dementia, leading to death within 10-20 years.

Huntingtin is a 350 kDa protein that is altered in HD. The expanded trinucleotide CAG repeat of the huntingtin gene encodes an abnormally expanded polyglutamine stretch in the N-terminus of the protein. The abnormal form of huntingtin aggregates in vitro and forms neuronal intranuclear and cytoplasmic inclusions in HD patients. Furthermore, the expanded polyglutamine repeats have been proposed to cause neuronal degeneration in HD through abnormal interactions with other proteins containing short polyglutamine tracts such as the CREB binding protein (CBP). CREB promotes cell survival and is a major mediator of survival signals in mature neurons.

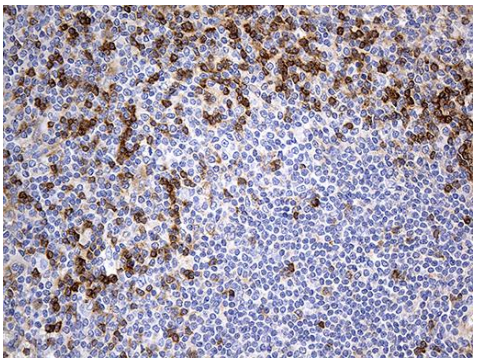
Huntingtin-interacting proteins

HIP1 (Huntingtin-interacting protein 1) was identified as a protein that associates with huntingtin. Binding of HIP1 to huntingtin is dramatically reduced following polyglutamine expansion, strongly implicating this interaction in the disease process. Huntingtin has also been shown to interact with the following proteins: **GAPDH**, HAP1, **HIP7 (Huntingtin-interacting protein 7, Optineurin)** and **HIP2 (Huntingtin-interacting protein 2)**. HIP2 is a ubiquitin conjugating enzyme which binds selectively to a large region at the N-terminus of huntingtin. HIP2-driven ubiquitination of huntingtin marks it for selective degradation via the proteasomal pathway. HIP2 may mediate foam cell formation by the suppression of apoptosis.



GAPDH IHC staining with anti-GAPDH mouse monoclonal antibody, cat# TA802563, of paraffin-embedded Human breast tissue within the normal limits (Heat-induced epitope retrieval by 10mM citric buffer, pH6.0, 120C for 3min).

HIP9 (Huntingtin-interacting protein 9) is the alpha subunit of the adaptor protein complex 2 (AP-2) which participates in membrane traffic pathways. AP-2 plays a key role in clathrin-dependent endocytosis. Cargo proteins are ferried into clathrin-coated vesicles (CCVs) which fuse with the early endosome. HIP9 (AP-2 alpha subunit) is responsible for orienting AP-2 on the membrane (binding accessible polyphosphoinositi-decontaining lipids) and also recognizing and binding to endocytosis signal motif [ED]-X-X-X-L-[LI] of endocytic transmembrane accessory proteins via its C-terminal cytosolic tail.



IHC staining with anti-optineurin mouse monoclonal antibody, cat# TA812132, of paraffin-embedded Human spleen tissue within the normal (Heat-induced epitope retrieval by 1mM EDTA in 10mM Tris buffer (pH8.5) at 120°C for 3 min).

HIP14 is a novel huntingtin-interacting protein. Its interaction with huntingtin is inversely correlated to the polyglutamine length of huntingtin. HIP14 protein, which is enriched in the brain, has been reported to show partial co-localization with huntingtin in the striatum. It is found in a subset of neurons affected in HD. One related protein is HIP14-like (HIP14L), which has 69 % homology to HIP14.

Huntingtin-associated protein-1 (HAP1) is highly expressed in brain and has been demonstrated to mediate the neuropathology of HD. HAP1 interacts with huntingtin, with two cytoskeletal proteins (dynactin and pericentriolar autoantigen protein 1) and with a hepatocyte growth factorregulated tyrosine kinase substrate. The interactions with cytoskeletal proteins and a kinase substrate indicate a role for HAP1 in vesicular trafficking or organelle transport.

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Products for HD research

Gene/Protein	Description	SKU
GAPDH	anti hu GAPDH mouse monocl. antibody; for WB, IHC	TA802563
GAPDH	anti hu GAPDH mouse monocl. antibody; for WB, IHC	TA802524
GAPDH	hu GAPDH CRISPR kit	KN402309
GAPDH	hu GAPDH shRNA as lentiviral particles	TL312841V
Huntingtin	anti hu, ms Huntington mouse monocl. antibody; for WB	TA309937
Huntingtin	Anti hu, ms, rt Huntingtin rabbit polycl. antibody; for IHC	AP33391PU-N
Huntingtin	hu Huntingtin CRISPR kit	KN418435
Huntingtin	hu Huntingtin shRNA as lentiviral particles	TL312497V
HIP1	anti hu HIP1 mouse monocl. antibody; for WB, IHC	TA804377
HIP1	anti hu HIP1 mouse monocl. antibody; for WB, ICH	TA804083
HIP1	hu HIP1 CRISPR kit	KN411418
HIP1	hu HIP1 shRNA as lentiviral particles	TL312457V
HIP2	Anti hu HIP2 goat polycl. antibody; for WB, IHC	AP23819PU-N
HIP2	hu HIP2 CRISPR kit	KN408645
HIP2	hu HIP2 shRNA as lentiviral particles	TL312455V
HIP7/Optineurin	Anti hu Optineurin mouse monocl. antibody; for WB, IHC	TA812132
HIP7/Optineurin	Anti hu, ms, rt Optineurin rabbit polycl. antibody; for WB, IHC	TA332444
HIP7/Optineurin	hu Optineurin CRISPR kit	KN402470
HIP7/Optineurin	hu Optineurin shRNA as lentiviral particles	TL311010V
HIP9	hu HIP9 rabbit polycl. antibody; for WB, IHC, FC	TA325045
HIP9	hu, ms, rt HIP9 rabbit polycl. antibody; for WB	TA332663
HIP9	hu HIP9 CRISPR kit	KN403018
HIP9	hu HIP9 shRNA as lentiviral particles	TL314753V
HIP14	Anti hu, ms HIP14 goat polycl. antibody; for WB, IHC	TA302507
HIP14	hu, bov, ms, rt, dog, pig, horse, rb HIP14 rabbit polycl. antibody; for WB, IHC	TA341967
HIP14	hu HIP14 CRISPR kit	KN407982
HIP14	hu HIP14 shRNA as lentiviral particles	TL300348V
HAP1	anti hu, ms, rt HAP1 mouse monocl. antibody; for WB, IHC	TA309681
HAP1	Anti hu, ms, rt HAP1 rabbit polycl. antibody; for WB, IHC, IF	TA306425
HAP1	hu HAP1 CRISPR kit	KN420251
HAP1	hu HAP1 shRNA as lentiviral particles	TL304153V