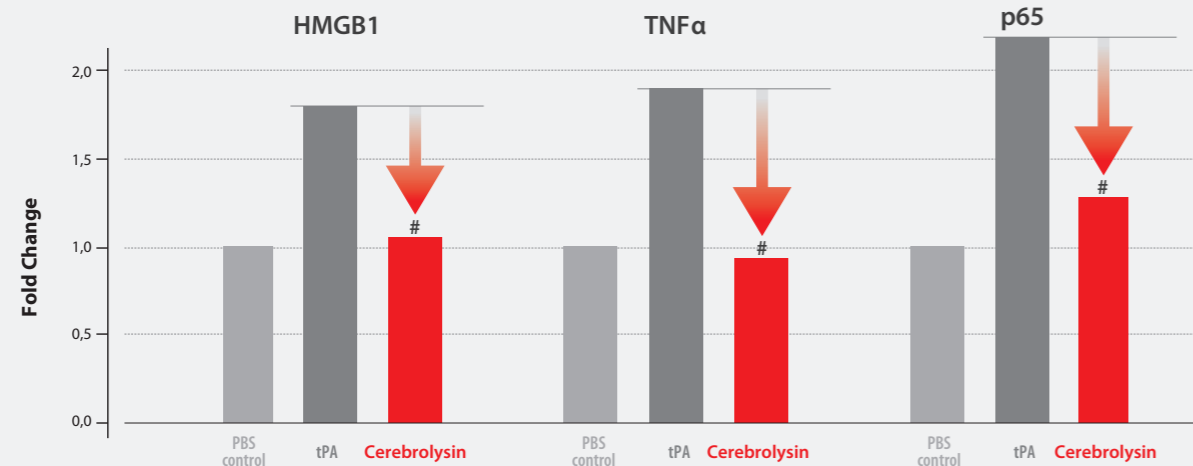


Significant effects with Cerebrolysin®

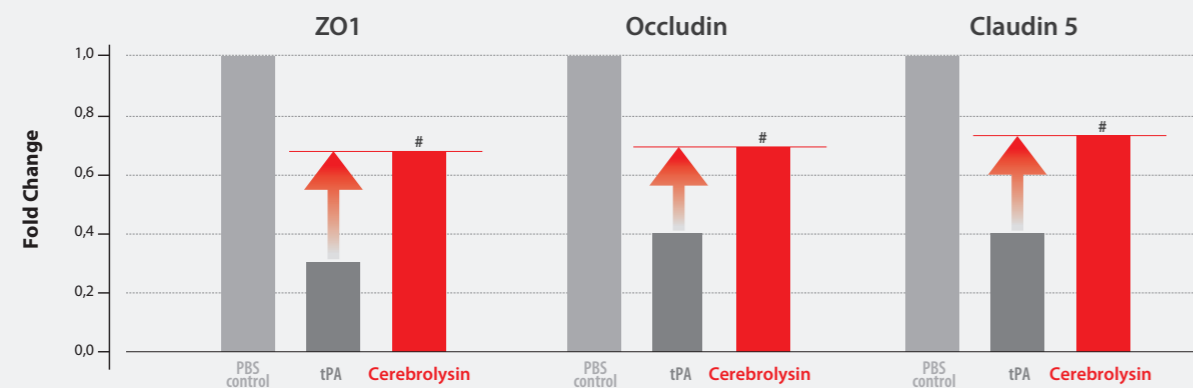
Significantly decrease of tPA/fibrin-increased proinflammatory and procoagulant proteins¹



Western blot showed protein levels in the individual experimental groups treated with Cerebrolysin in combination with tPA, #P<0.001 vs. tPA or fibrin. HMGB1, high mobility group box 1; TNFα, tumor necrosis factor α; p65, phosphorylated nuclear factor kappa B (NFκB)-p65N

Cerebrolysin® reduces inflammation!

Significantly increase of tPA/fibrin-reduced tight junction proteins²



Western blot showed protein levels in the individual experimental groups treated with Cerebrolysin in combination with tPA, #P<0.001 vs. tPA or fibrin. Zo1 = zonular 1

Cerebrolysin® increases tight junctions!



full article

Title: Therapeutic effect of Cerebrolysin on reducing impaired cerebral endothelial cell permeability

Author: Teng, Hua, et al.

Journal: NeuroReport 32.5 (2021): 359-366



Cerebrolysin improves BBB integrity

Reduction of tPA/fibrin-impaired BBB permeability

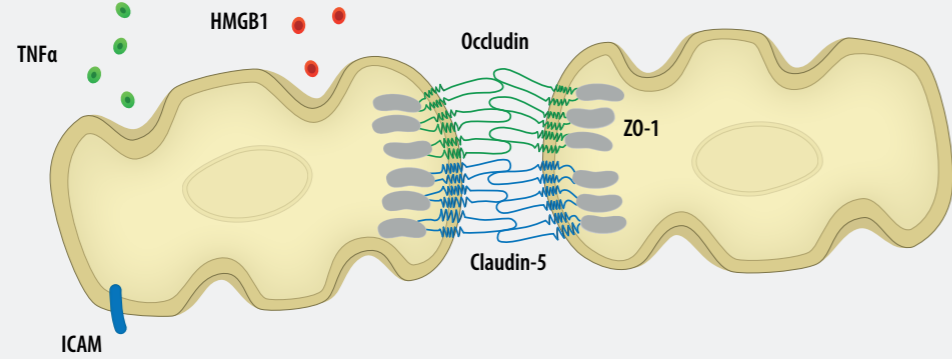
Teng, Hua, et al. „Therapeutic effect of Cerebrolysin on reducing impaired cerebral endothelial cell permeability.“ NeuroReport 32.5 (2021): 359-366.

tPA/fibrin-impaired BBB permeability

Standard cerebral endothelial cells
play an important role in blood brain barrier (BBB) functionality!

Inflammatory and procoagulant proteins
= TNF α , HMGB1, p65

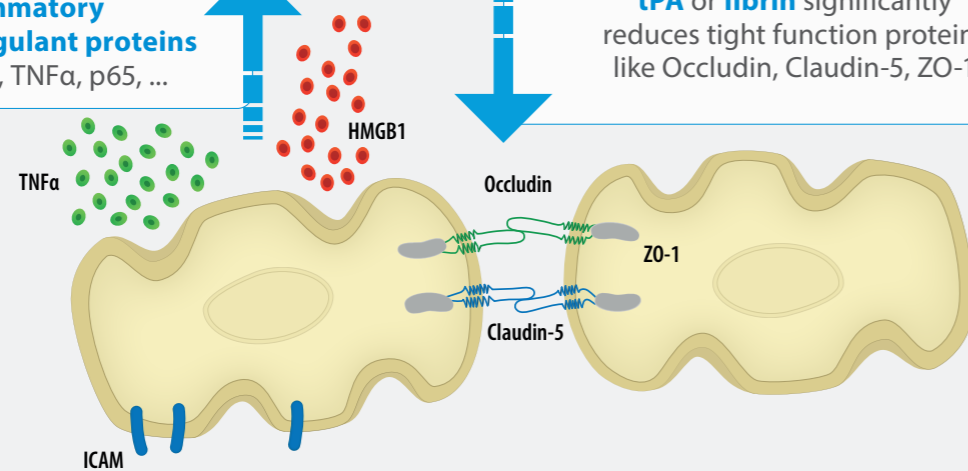
Tight junctions
= Occludin, Claudin-5, ZO-1



tPA/fibrin increases endothelial cell leakage and inflammation
→ increased permeability

tPA or fibrin
significantly increases
inflammatory
and pro-coagulant
proteins
like HMGB1, TNF α , p65, ...

tPA or fibrin significantly
reduces tight junction proteins
like Occludin, Claudin-5, ZO-1

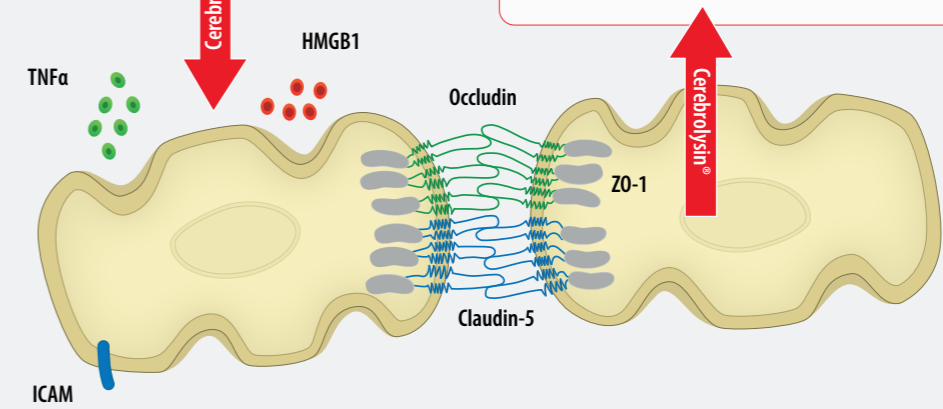


Risk of intracerebral hemorrhage!

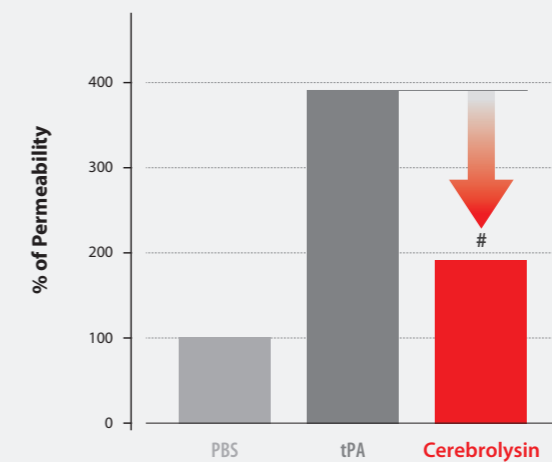
Cerebrolysin® improves cerebral endothelial cell integrity

Cerebrolysin®
significantly **reduces** inflammatory
and pro-coagulant proteins like
HMGB1, TNF α , p65, ...

Cerebrolysin®
significantly **increases**
BBB tight junction proteins like
Occludin, Claudin-5, ZO-1
and decrease permeability!



Cerebrolysin® significantly reduction
of tPA/fibrin augmented permeability **by more than 50%**



BBB gets tighter again with Cerebrolysin®!