ATN-161

ATN 161 is a Alpha-5 beta-1 integrin receptor antagonist.

ATN-161, is beneficial in a mouse model of ischemic stroke through reduction of infarct volume, edema, stabilization of the BBB, and reduced inflammation and immune cell infiltration into the brain. In continuation with our previous findings, we have further evaluated the mechanistic role of ATN-161 in vitro and found that oxygen and glucose deprivation and reperfusion (OGD/R)-induced inflammation, oxidative stress, apoptosis, mitochondrial depolarization, and fibrosis attenuate tight junction integrity via induction of α5, NLRP3, p-FAK, and p-AKT signaling in mouse brain endothelial cells. ATN-161 treatment (10 μM) effectively inhibited OGD/R-induced extracellular matrix (ECM) deposition by reducing integrin α5, MMP-9, and fibronectin expression, as well as reducing oxidative stress by reducing mitochondrial superoxide radicals, intracellular ROS, inflammation by reducing NLRP3 inflammasome, tight junction loss by reducing claudin-5 and ZO-1 expression levels, mitochondrial damage by inhibiting mitochondrial depolarization, and apoptosis via regulation of p-FAK and p-AKT levels. Taken together, our results further support therapeutically targeting α5 integrin with ATN-161, a safe, well-tolerated, and clinically validated peptide, in ischemic stroke [1)].

Many efforts to design and screen therapeutics for the current severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) pandemic have focused on inhibiting viral host cell entry by disrupting angiotensin-converting enzyme-2 (ACE2) binding with the SARS-CoV-2 spike protein. This work focuses on the potential to inhibit SARS-CoV-2 entry through a hypothesized α5β1 integrin-based mechanism and indicates that inhibiting the spike protein interaction with α5β1 integrin (+/- ACE2) and the interaction between α5β1 integrin and ACE2 using a novel molecule (ATN-161) represents a promising approach to treat coronavirus disease-19 [2)].

1)
Amruta N, Bix G. ATN-161 Ameliorates Ischemia/Reperfusion-induced Oxidative Stress, Fibro-inflammation, Mitochondrial damage, and Apoptosis-mediated Tight Junction Disruption in bEnd.3 Cells. Inflammation. 2021 Aug 22. doi: 10.1007/s10753-021-01509-9. Epub ahead of print. PMID: 34420157.
2)
Beddingfield BJ, Iwanaga N, Chapagain PP, Zheng W, Roy CJ, Hu TY, Kolls JK, Bix GJ. The Integrin Binding Peptide, ATN-161, as a Novel Therapy for SARS-CoV-2 Infection. JACC Basic Transl Sci. 2021 Jan;6(1):1-8. doi: 10.1016/j.jacbts.2020.10.003. Epub 2020 Oct 16. PMID: 33102950; PMCID: PMC7566794.