

Technical Information

tNRP1

total Neuropilin-1

CE

Cat. No.:	BI-20409
Tests:	96
Method:	ELISA
Range:	0 – 12 nmol/l
LLOQ:	0.09 nmol/l (STD2 0.37 nmol/l)
Incubation time:	4 hours
Sample volume:	10 µl
Sample type:	Serum, plasma
Sample preparation:	Centrifuge freshly collected blood as soon as possible Store centrifuged samples at -20°C for longer storage. Samples are stable up to 5 freeze and thaw cycles. Hemolyzed or lipemic samples may cause erroneous results.

Reference values:	Median serum (n=24) = 2.0 nmol/l Median EDTA plasma (n=24) = 1.7 nmol/l Median heparin plasma (n=24) = 1.9 nmol/l Median citrate plasma (n=24) = 1.7 nmol/l
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Species:	Human
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Intended use:

Neuropilin-1 (NRP1) is a single-pass transmembrane glycoprotein of 923 amino acids, composed of a large extracellular region, a short transmembrane domain and a short cytoplasmic tail <https://www.uniprot.org/uniprot/O14786>. Due to alternative splicing or shedding, the extracellular region can be released into circulation as soluble Neuropilin. NRP1 is an essential cell surface receptor functioning in many key biological processes including the cardiovascular, neuronal, and immune systems (1,2). Multiple ligands bind to the extracellular region of NRP1, like class III semaphorins which have a key role in axonal guidance, or members of the VEGF family of angiogenic cytokines. Ligand-binding to transmembrane NRP1, which has co-receptor function, leads to signaling via receptor proteins containing a PDZ domain. In contrast, ligand-binding to soluble Neuropilin-1 (sNRP1) has antagonistic properties by acting as decoy (1,3). NRP1 is expressed by a variety of cells and tissues. For instance, the transmembrane protein is expressed by neuronal cells, endothelial cells, vascular smooth muscle cells, cardiomyocytes, multiple tumor cell lines and neoplasms, osteoblasts, naïve T cells or platelets. Expression of soluble Neuropilin-1 is further described in a variety of non-endothelial cells, e.g. in liver hepatocytes and kidney distal and proximal tubules. NRP1 is implicated in a multitude of physiological and pathological settings, e.g. in axon guidance, vascularization, tumor growth or regeneration and repair (4-9). Neuropilin-1 is described to stimulate osteoblast differentiation, to act as potential biomarker for the prediction of heart failure outcome or to play a role in renal fibrogenesis (6, 10,11). As a co-receptor for VEGF, NRP1 is a potential target for cancer therapies (12). The Neuropilin-1 enzyme immunoassay is a four hour ELISA to quantify human total soluble Neuropilin-1 (sNRP1). The assay is validated for human serum and plasma samples (EDTA, citrate, heparin) (13) (see validation data: www.bmgrp.com). To remove potentially bound ligands, samples are pre-treated with guanidine hydrochloride

before testing. Recombinant human soluble Neuropilin-1, isoform 2, is used as calibrator.

Intended applications:

- Oncology
- Osteology
- Nephrology
- Cardiovascular medicine

Literature:

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5. Neuropilin 1 expression in human aortas, coronaries and the main bypass grafts. Alattar M et al., Eur J Cardiothorac Surg, 2014; 46(6): 967-973.
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7. Neuropilins: role in signalling, angiogenesis and disease. Zachary I, Chem Immunol Allergy, 2014; 99: 37-70.
8. Neuropilin-1 is upregulated in the adaptive response of prostate tumors to androgen-targeted therapies and is prognostic of metastatic progression and patient mortality. Tse BWC et al., Oncogene, 2017; 36(24): 3417- 3427.
9. Dual Function of NRP1 in Axon Guidance and Subcellular Target Recognition in Cerebellum. Telley L et al., Neuron, 2016; 21; 91(6): 1276-1291.
10. Nrp1, a Neuronal Regulator, Enhances DDR2-ERK-Runx2 Cascade in Osteoblast Differentiation via Suppression of DDR2 Degradation. Zhang Y et al., Cell Physiol Biochem, 2015; 36(1): 75-84.
11. Neuropilins: structure, function and role in disease. Pellet-Many C et al., Biochem J, 2008; 411(2): 211-226.
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