VANIN-1 ELISA

BIOMEDICA

MARKER FOR

- **DRUG-INDUCED & SPONTANEOUS ACUTE KIDNEY INJURY**
- **OBSTRUCTIVE & DIABETIC NEPHROPATHY**

FOR CLINICAL SAMPLES

FOR PRECLINICAL SAMPLES

FULLY VALIDATED

ONE-STEP ELISA

Setting the **standard**
for clinical research.

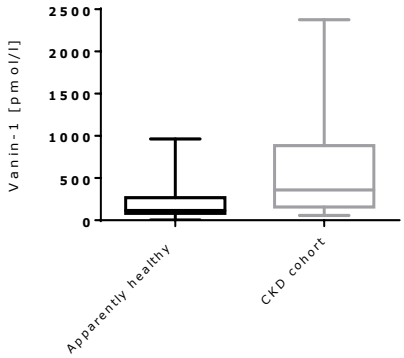
Human VANIN-1 (Urine) ELISA (Cat.No. BI-VAN1U)

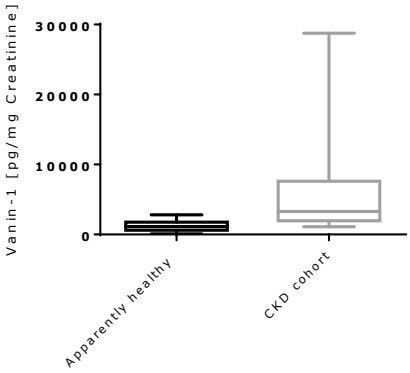
Features and Benefits

- RIGOROUSLY VALIDATED – according to FDA/ICH/EMEA guidelines
- OPTIMIZED for human URINE samples
- CONVENIENT PROTOCOL – ONE-STEP ELISA
- PROPRIETARY PRODUCT – in-house R&D and production
- HIGHLY SPECIFIC – characterized antibodies and reagents

VANIN-1 Values in Human Urine Samples

VANIN-1 is significantly elevated in urine samples of chronic kidney disease (CKD) patients.





	Apparently Healthy Individuals (n=27)		CKD Patients (n=24)	
	VANIN-1 [pmol/l]	VANIN-1 [pg/mg Creatinine]	VANIN-1 [pmol/l]	VANIN-1 [pg/mg Creatinine]
Median	**116**	**1131**	**360**	**3280**
Range	3-963	77-2813	57-2375	1101-28764

Assay Characteristics

- Method: Sandwich ELISA, HRP/TMB, 12x8-well strips
- Sample type: human urine
- Sample volume: 10 µl / well
- Assay time: 4 h / 30 min
- Sensitivity: 9.6 pmol/l
- Standard range: 0 - 1,200 pmol/l (7 standards and 2 controls)
- Specificity: Endogenous and recombinant human Vanin-1
- Precision: Within-run ≤5; In-between-run ≤7
- Unit conversion: 1 pg/ml = 0.0192 pmol/l; MW: 52.07 kDa

Accuracy

	Spike/Recovery [%]			
	+120 pmol/l		+600 pmol/l	
Sample Matrix	**Mean**	**Range**	**Mean**	**Range**
Urine (n=6)	81	73-92	93	86-99

Parallelism

	Recovery [%]					
	1+1		1+3		1+7	
Sample Matrix	**Mean**	**Range**	**Mean**	**Range**	**Mean**	**Range**
Urine (n=6)	94	85-100	92	79-98	86	69-99

Mouse/Rat VANIN-1 ELISA (Cat.No. BI-VAN1MR)

Features and Benefits

- LOW SAMPLE VOLUME – 5 µl / well
- OPTIMIZED for mouse/rat serum and plasma samples
- CONVENIENT PROTOCOL – ONE-STEP ELISA
- PROPRIETARY PRODUCT – in-house R&D and production
- HIGHLY SPECIFIC – characterized antibodies and reagents

VANIN-1 Values in Mouse and Rat Samples

VANIN-1 is a novel biomarker for early detection of drug-induced acute kidney injury and has superior predictive value for AKI than established markers KIM-1, NGAL, or NAG.

	VANIN-1 [pmol/l]				
	Mouse			Rat	
Sample Matrix	**Serum (n=5)**	**Plasma (n=5)**	**Urine (n=6)**	**Serum (n=8)**	**Plasma (n=8)**
Median	**22**	**24**	**21**	**7**	**7**
Range	9-39	19-34	3-62	6-11	5-16

Assay Characteristics

- Method: Sandwich ELISA, HRP/TMB, 12x8-well strips
- Sample type: mouse/rat serum, plasma, urine
- Sample volume: 5 µl / well
- Assay time: 4 h / 30 min
- Sensitivity: 2.31 pmol/l
- Standard range: 0 - 200 pmol/l
- Specificity: Endogenous and recombinant mouse/rat Vanin-1
- Precision: Within-run ≤8; In-between-run ≤8
- Unit conversion: 1 ng/ml = 19.2 pmol/l (MW: 52.07 kDa)

Accuracy

	Spike/Recovery [%]			
	+25 pmol/l		+100 pmol/l	
Sample Matrix	**Mean**	**Range**	**Mean**	**Range**
Mouse (n=7)	93	87-124	90	79-102
Rat (n=4)	94	68-103	87	78-96

Parallelism

	Recovery [%]					
	1+1		1+3		1+7	
Sample Matrix	**Mean**	**Range**	**Mean**	**Range**	**Mean**	**Range**
Mouse (n=4)	97	84-103	84	71-94	95	85-105
Rat (n=3)	92	87-106	-	-	-	-

VANIN-1

Areas of Interest

- Acute kidney injury
- Diabetic nephropathy
- Drug-induced acute kidney injury
- Obstructive nephropathy

Background

VANIN-1 is a glycoprotein that is selectively expressed in renal tubular cells.

VANIN-1 is an epithelial ectoenzyme activating the conversion of pantetheine into pantothenic acid (vitamin B5) and cysteamine (1).The highest levels of VANIN-1 expression is assigned to renal tubular epithelial cells while no expression is detectable in the glomeruli (1, 2). Hence, VANIN-1 released from renal cells can be detected in the urine.

Urinary VANIN-1 is a novel biomarker for early detection of drug-induced acute kidney injury. VANIN-1 has as superior predictive value for acute kidney injury than established markers KIM-1, NGAL, or NAG.

In a rat model of nephrotoxicant-induced injury, VANIN-1 is upregulated in renal tubules earlier than other markers and shed into urine (1). Studies demonstrate that VANIN-1 is an early biomarker of renal tubular damage in drug-induced acute kidney injury (3,4), obstructive nephropathy and hydronephrosis (5,6), diabetic nephropathy (7), and renal injury in experimental colitis (8).

Literature

1. Pantetheinase activity of membrane-bound Vanin-1: lack of free cysteamine in tissues of Vanin-1 deficient mice. Pitari G et al., 2000; FEBS Letters 483, 2: 149–54.
2. Vanin-1: A Potential Biomarker for Nephrotoxicant-Induced Renal Injury. Hosohata K et al., 2011; Toxicology 290, 1: 82–88.
3. Urinary Vanin-1 as a Novel Biomarker for Early Detection of Drug-Induced Acute Kidney Injury. Hosohata K et al., 2002; Journal of Pharmacology and Experimental Therapeutics 341, 3: 656–62.
4. Early Urinary Biomarkers for Renal Tubular Damage in Spontaneously Hypertensive Rats on a High Salt Intake. Hosohata K et al. 2016a; Hypertension Research: Official Journal of the Japanese Society of Hypertension 39, 1: 19–26.
5. A Novel Biomarker for Acute Kidney Injury, Vanin-1, for Obstructive Nephropathy: A Prospective Cohort Pilot Study. Washino S et al., 2019; International Journal of Molecular Sciences 20, 4.
6. Vanin-1 in Renal Pelvic Urine Reflects Kidney Injury in a Rat Model of Hydronephrosis. Hosohata K et al., 2018; International Journal of Molecular Sciences 19:10.
7. Proteomic Identification of Vanin-1 as a Marker of Kidney Damage in a Rat Model of Type 1 Diabetic Nephropathy. Fugmann T et al., 2011; Kidney International 80, 3: 272–81.
8. Early Detection of Renal Injury Using Urinary Vanin-1 in Rats with Experimental Colitis. Hosohata K et al., 2014; Journal of Applied Toxicology: JAT 34, 2: 184–90.

Related Biomedica Products

- Human FGF23 intact ELISA (Cat.no.BI-20700)
- FGF23 (C-terminal) ELISA (Cat.no. BI-20702)
- Endostatin ELISA (Cat.no. BI-20742)
- Mouse/Rat Endostatin ELISA (Cat.no. BI-20742MR)
- Big Endothelin ELISA (Cat.no. BI-20082H)
- NT-proBNP ELISA (Cat.no. SK1204)
- NT-proANP ELISA (Cat.no. BI-20892)
- Sclerostin ELISA (Cat.no. BI-20492)

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