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BIOMARKERS IN NEPHROLOGY  
& TRANSPLANTATION



## ASSAY CHARACTERISTICS

### Anti C4d antibody (Cat.No: see applications)

**Cat.No: BI-RC4D – C€**

for IHC (paraffin embedded and frozen tissue section)

**Cat.No: BI-RC4D-FITC**

for flow cytometry application

### Endostatin ELISA (Cat.No.: BI-20742)

Method Sandwich ELISA, 12x8 tests  
Sample matrix serum, plasma (citrate, EDTA, heparin), urine protocol available  
Sample size 5 µl neat sample volume / test  
Standard range 0-80 nmol/l  
Incubation time 3 h / 1 h / 30 min, room temperature

### OPG ELISA (Cat.No.: BI-20403) – C€

Method Sandwich ELISA, 12x8 tests  
Sample matrix serum, plasma (citrate, EDTA, heparin)  
Sample size 20 µl / test  
Standard range 0-20 pmol/l  
Incubation time 4 h / 1 h / 30 min, room temperature

### Sclerostin ELISA (Cat.No.: BI-20492)

Method Sandwich ELISA, 12x8 tests  
Sample matrix serum, plasma (citrate, EDTA, heparin)  
Sample size 20 µl / test  
Standard range 0-240 pmol/l  
Incubation time overnight / 1 h / 30 min, room temperature



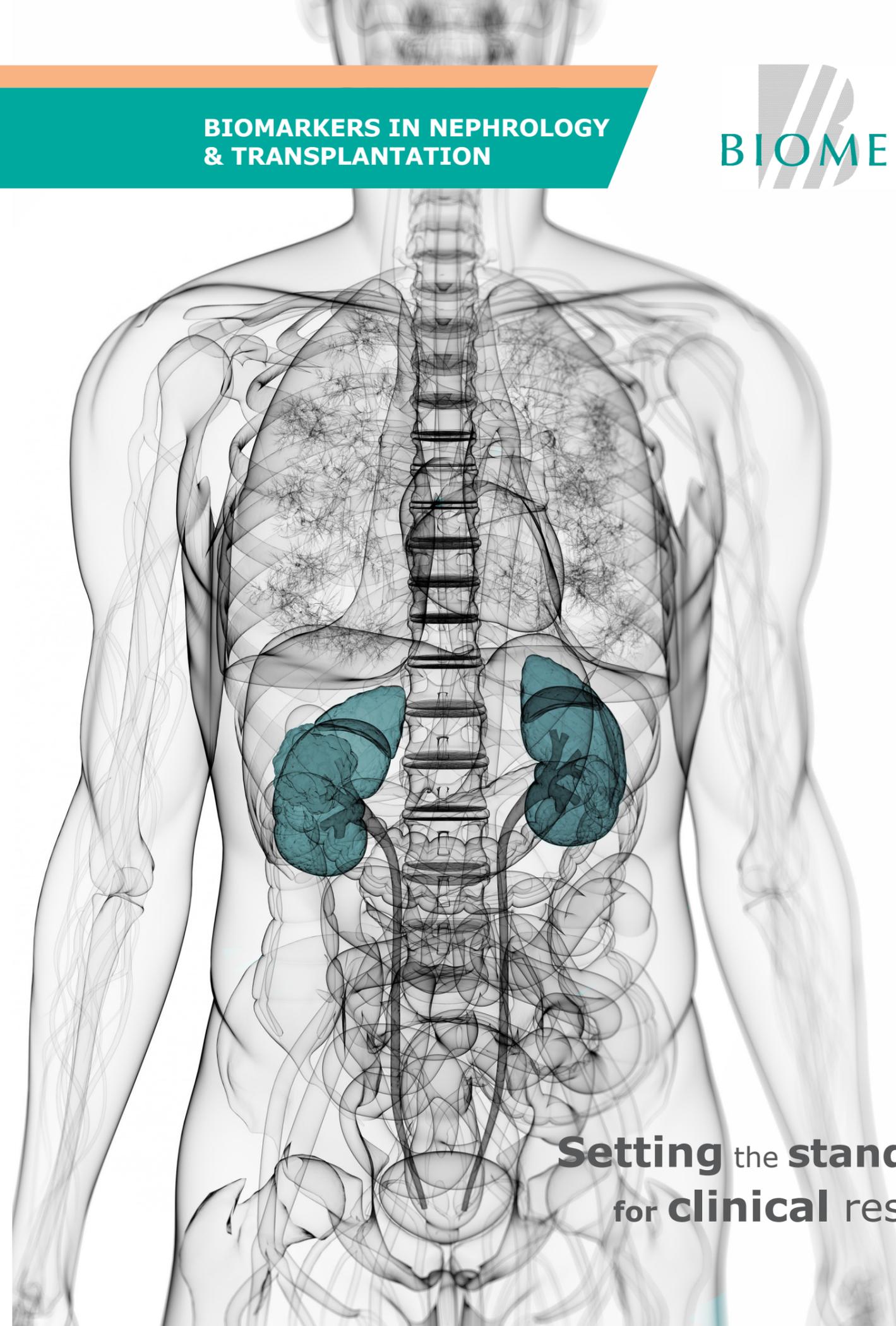
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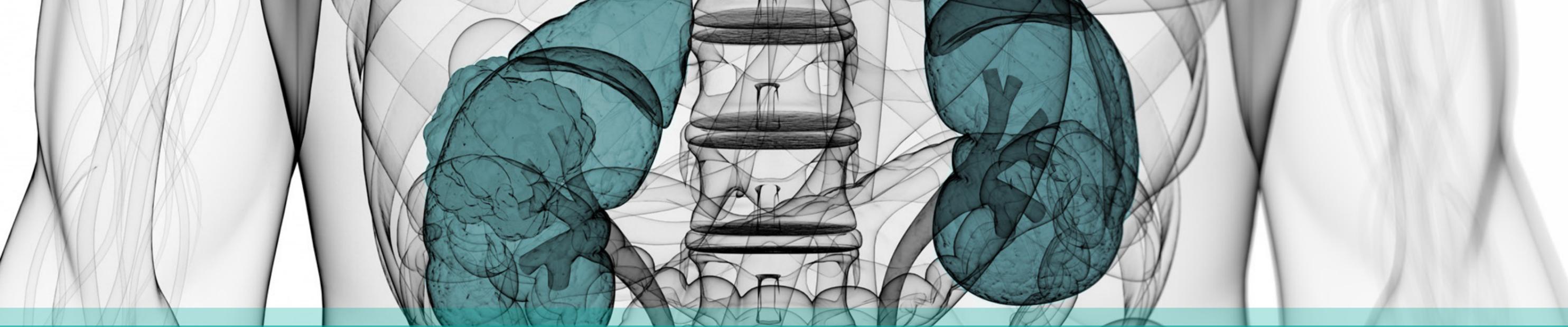
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# ANTI C4d ANTIBODY · ENDOSTATIN · OSTEOPROTEGERIN (OPG) · SCLEROSTIN

## ANTI C4d

### FOR THE HUMORAL REJECTION IN RENAL, HEART AND LUNG TRANSPLANTS

**Solid phase detection of C4d-fixing HLA antibodies to predict rejection in high immunological risk kidney transplant recipients.**

*Bartel G et al., Transpl Int, 2013; 26(2): 121-130*  
“... pretransplant SAB-based detection of complement-fixing DSA may be a valuable tool for risk stratification.”

**Preformed complement-activating low-level donor-specific antibody predicts early antibody-mediated rejection in renal allografts.**

*Lawrence C et al., Transplantation, 2013; 95(2):341-346*

“.. C4d SAFB is potentially a powerful tool for risk stratification prior to transplantation and may allow identification of unacceptable donor antigens, or patients who may require enhanced immunosuppression.”

**Modified solid-phase alloantibody detection for improved crossmatch prediction.**

*Wahrmann M et al., Hum Immunol, 2013; 74(1): 32-40*

“Our data suggest particular efficiency of solid-phase complement detection as a tool for virtual crossmatching.”

## ENDOSTATIN

### FOR THE PROGRESSION OF KIDNEY DISEASE

**Elevated plasma levels of endostatin are associated with chronic kidney disease.**

*Chen J et al., Am J Nephrol, 2012;35(4): 335-340*  
“ These data indicate that elevated plasma endostatin is strongly and independently associated with CKD.”

**Early-onset coronary artery disease after pediatric kidney transplantation: implicating the angiogenesis inhibitor, endostatin.**

*Iqbal CW et al., Am Surg, 2011; 77(6): 731-735*

“Endostatin levels were greater in kidney transplant recipients compared with liver transplant recipients and healthy control subjects. Endostatin may play a role in the development of atherosclerosis after kidney transplantation and may serve as a biomarker for atherosclerotic disease.”

**A defective angiogenesis in chronic kidney disease.**

*Futrakul N et al., Ren Fail, Jan 2008; 30(2): 215-217*

“Enhanced CEC reflects an increased activity of vascular injury. A deficient VEGF in the presence of enhanced antiangiogenesis (endostatin) implies a defective angiogenesis. This may explain the progressive nature of renal microvascular disease observed in late stage of CKD patients.”

## OSTEOPROTEGERIN

### FOR THE PREDICTION OF CARDIOVASCULAR MORTALITY

**Osteoprotegerin as a predictor of renal and cardiovascular outcomes in renal transplant recipients: follow-up data from the ALERT study.**

*Svensson M et al., Nephrol Dial Transplant, 2012; 27: 2571-2575*

“In a large cohort of kidney transplant patients with long-term follow-up, OPG was independently associated with renal events, CV events and mortality.”

**Serum osteoprotegerin is a predictor of progression of atherosclerosis and coronary calcification in hemodialysis patients.**

*Kurnatowska I et al., Nephron Clin Pract, 2011; 117(4): c297-304*

“The plasma level of OPG could serve as a surrogate marker of progression of atherosclerosis and calcification in patients with end-stage renal disease.”

**Correlates of osteoprotegerin and association with aortic pulse wave velocity in patients with chronic kidney disease.**

*Sciolla J et al., Clin J Am Soc Nephrol, 2011; 6: 2612-2619*

“These data support a strong relationship between serum OPG and arterial stiffness independent of many potential confounders including traditional cardiovascular risk factors...”

## SCLEROSTIN

### FOR THE DIAGNOSIS OF HIGH BONE TURNOVER IN CKD

**Sclerostin serum levels correlate positively with bone mineral density and microarchitecture in haemodialysis patients.**

*Cejka D et al., Nephrol Dial Transplant, 2012; 27: 226-230*

“Dialysis patients had significantly higher Sclerostin levels than controls”.

**Sclerostin and DKK-1 levels in pre-dialysis CKD patients.**

*Behets G et al., Nephrol Dial Transplant, 2012; 27: ii36-ii37*

“Serum Sclerostin levels but not DKK-1 levels increase along the progression of renal disease.”

**The Relation between Renal Function and Serum Sclerostin in Adult Patients with CKD.**

*Pelletier S et al., Clin J Am Soc Nephrol, 2013; 8: 819-823*

“..higher serum Sclerostin levels starting at CKD stage III.”

**Sclerostin: another bone-related protein related to all-cause mortality in haemodialysis?**

*Viaene L et al., Nephrol Dial Transplant, 2013; 10.1093/ndt/gft039*

“Higher circulating Sclerostin levels were associated with decreased mortality in prevalent HD patients”.