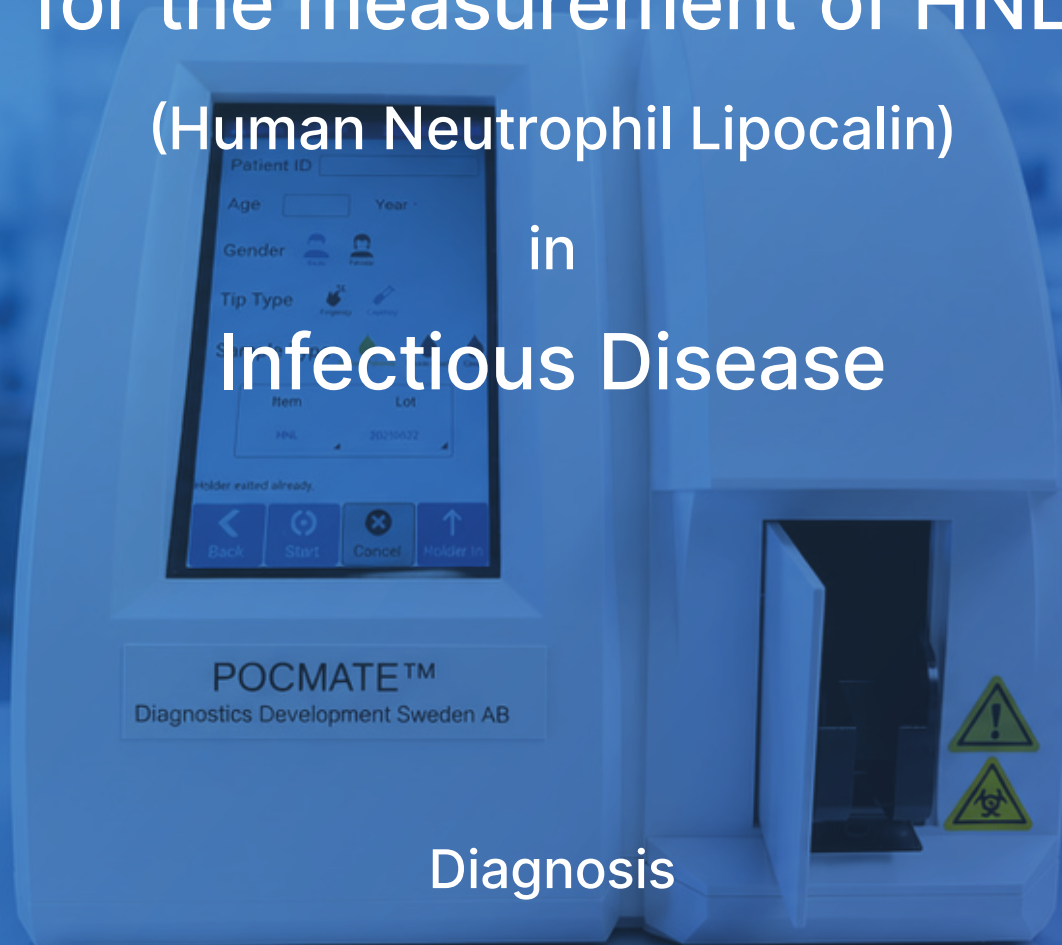


POCMATE™

for the measurement of HNL
(Human Neutrophil Lipocalin)

in
Infectious Disease



Diagnosis

Therapy Monitoring

Outcome prediction



Diagnostics Development

Human Neutrophil Lipocalin (HNL)

HNL (Human Neutrophil Lipocalin) is a complicated molecule existing in various forms in bodily fluids such as monomers, dimers and heteromers, the latter in complex with other molecules. The results of the measurement of HNL therefore very much depend on the antibodies raised against HNL.

The philosophy of Diagnostics Development has always been to raise antibodies against native monomeric or dimeric HNL, which has resulted in antibodies reacting to many different epitopes on the various forms of HNL. The combination of the different antibodies in immunoassays has resulted in HNL assays with different qualities. Some immunoassays show similar qualities as immunoassays of the related gene products NGAL and Lipocalin2 but some HNL immunoassays show superior performance in outcome prediction, in the diagnosis of acute infections and in antibiotics therapy monitoring.

Our HNL assays are based on native human HNL as immunogen and are available in different formats and antibody configurations. Our novel POCMATE™ assays takes advantage of the differences in epitope specificities of our antibodies and has resulted in the development of three different Point-of-Care assays with unique clinical applications:

Reader roadmap: The document first explains the HNL assay principle and then presents three clinical applications in a stepwise sequence: POCMATE™ Bact for rapid distinction between bacterial and viral infections, POCMATE™ Sepsis for antibiotic-treatment monitoring, and POCMATE™ AKI for outcome prediction and biomarker management in ICU patients.

POCMATE™ Bact

POCMATE™ Sepsis

POCMATE™ AKI

POCMATE™

Point-of-Care testing made simple, fast and accurate

Our novel POCMATE™ HNL assays takes advantage of differences in epitope specificities of our antibodies



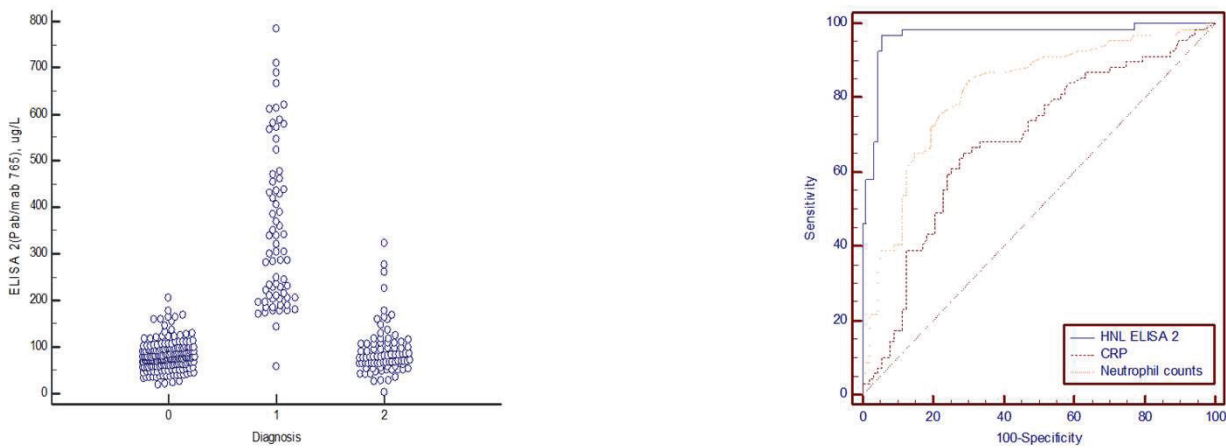
POCMATE™ Bact: Bacterial or Viral infection?

A patent-protected superior method for the distinction between bacterial and viral acute infections.

This first application focuses on diagnosis: identifying whether an acute infection is most likely bacterial or viral, so that treatment decisions can be made earlier and with greater confidence.

Serum measurement of HNL is a superior method for discrimination between acute infections caused by bacteria or virus (but requires strict pre-analytic handling of the blood).

Discrimination between acute infections caused by virus (n=87) or bacteria (n=69)
Serum samples obtained before antibiotics treatment

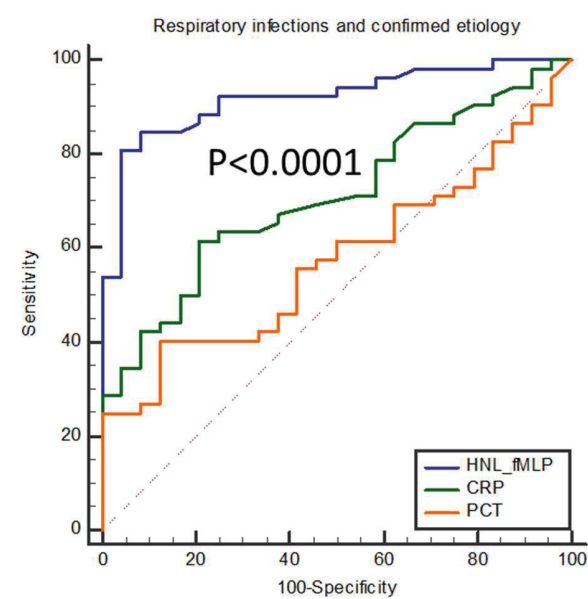


	AUC	95% CI	NPV% (95% CI)	PPV (95% CI)	P<0.0001
HNL	0.968	0.927 to 0.990	98(92-100)	93(85-98)	
CRP	0.682	0.602 to 0.754	72(62-81)	64(52-75)	
Neutrophil%	0.874	0.811 to 0.922	84(74-90)	79(67-88)	

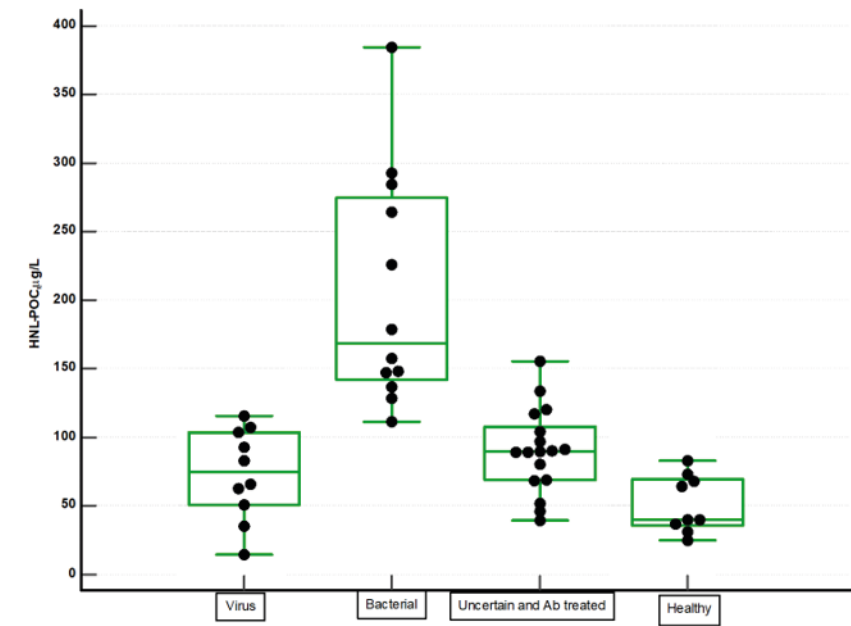
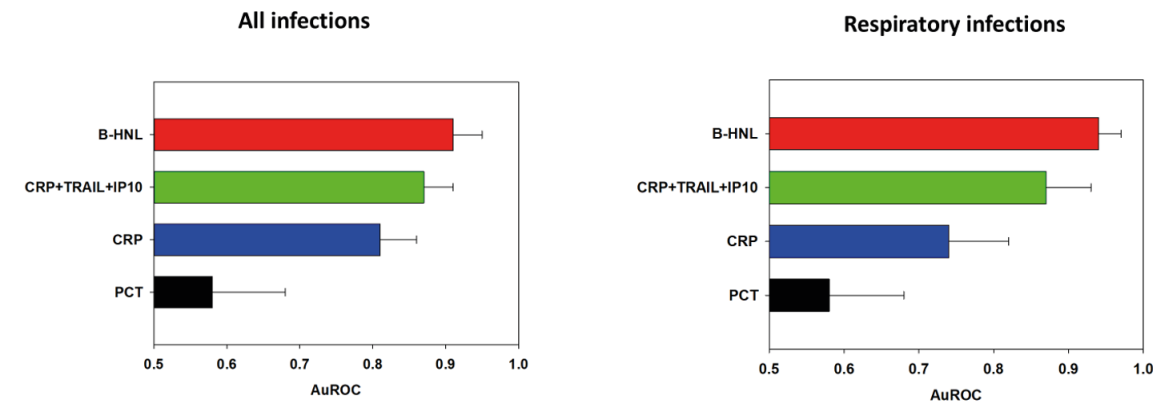
Activation of neutrophils in whole blood by the tri-peptide fMLP is an alternative and fast way to discriminate between acute infections caused by bacteria or virus.

In comparison to any other biomarker such as PCT, CRP, WBC and others, the distinction between infections caused by bacteria or virus is superior by measuring HNL after whole blood activation for 5-10 min. This is illustrated in the table and by the ROC analysis of patients with respiratory infections or in a mixed population with acute infections.

Diagnosis	B-HNL AuROC (95%CI)	PCT AuROC (95%CI)
Bacterial Pneumonia	0.868 (0.771-0.935)	0.647 (0.529-0.753)***
Streptococcal Tonsillitis	0.905 (0.815-0.960)	0.537 (0.418-0.653)***
Erysipelas	0.951 (0.856-0.991)	0.676 (0.534-0.991)**
Sepsis, endocarditis	0.980 (0.899-0.999)	0.938 (0.838-0.986)
URTI (excluding tonsillitis)	0.944 (0.838-0.990)	0.515 (0.383 to 0.645)***



The discrimination between bacterial and viral infections. Head-to-head comparison
All infections confirmed etiology



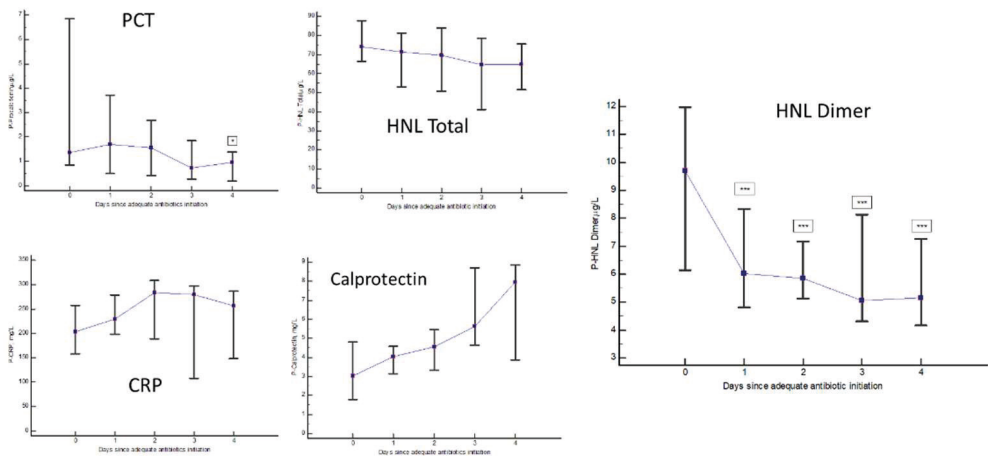
The first clinical trial of the POCMATE™ HNL Bact test to discriminate between acute infections.

POCMATE™ Sepsis: is your antibiotic treatment effective?

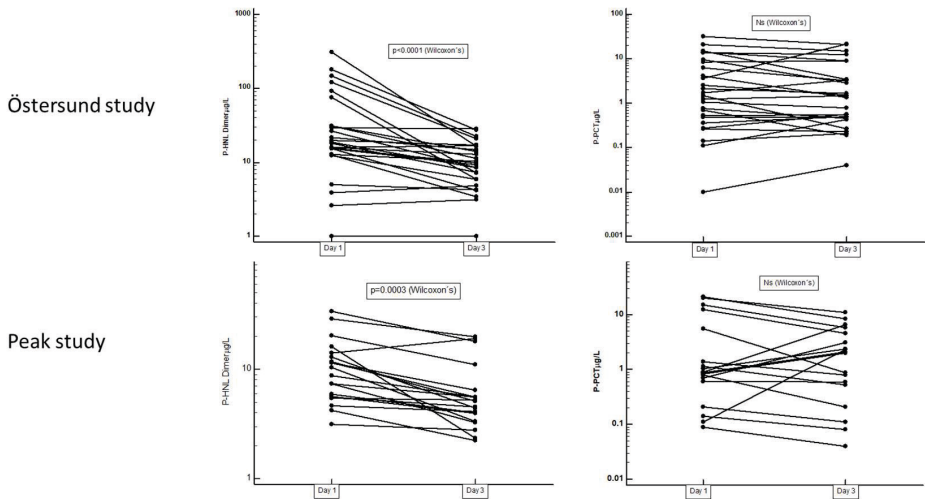
A patent-protected superior method for antibiotic stewardship of sepsis patients.

After diagnosis, the next clinical question is whether antibiotic therapy is working. This section therefore shifts from identifying infection type to monitoring early treatment response in sepsis patients.

Plasma biomarkers in septic patients after adequate antibiotics treatment



Successful antibiotics monitoring in sepsis



EDTA plasma measurement of dimeric HNL (left panel) shows early response to successful antibiotic treatment within 24 hours. PCT results (right panel).

POCMATE™ HNL Sepsis is available

POCMATE™ AKI: NGAL – and beyond

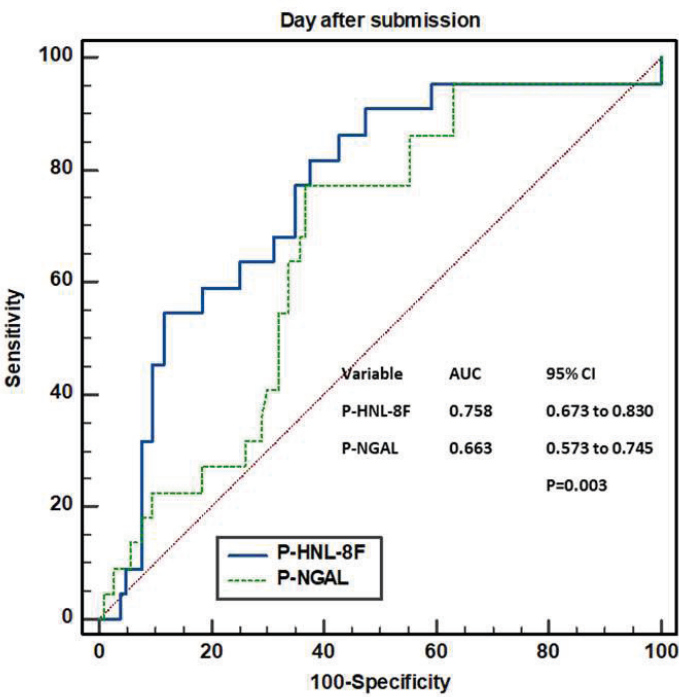
A patent-protected superior method for the biomarker management of the ICU patient.

The final application broadens the clinical value proposition from treatment monitoring to outcome prediction, with emphasis on AKI risk and ICU biomarker management.

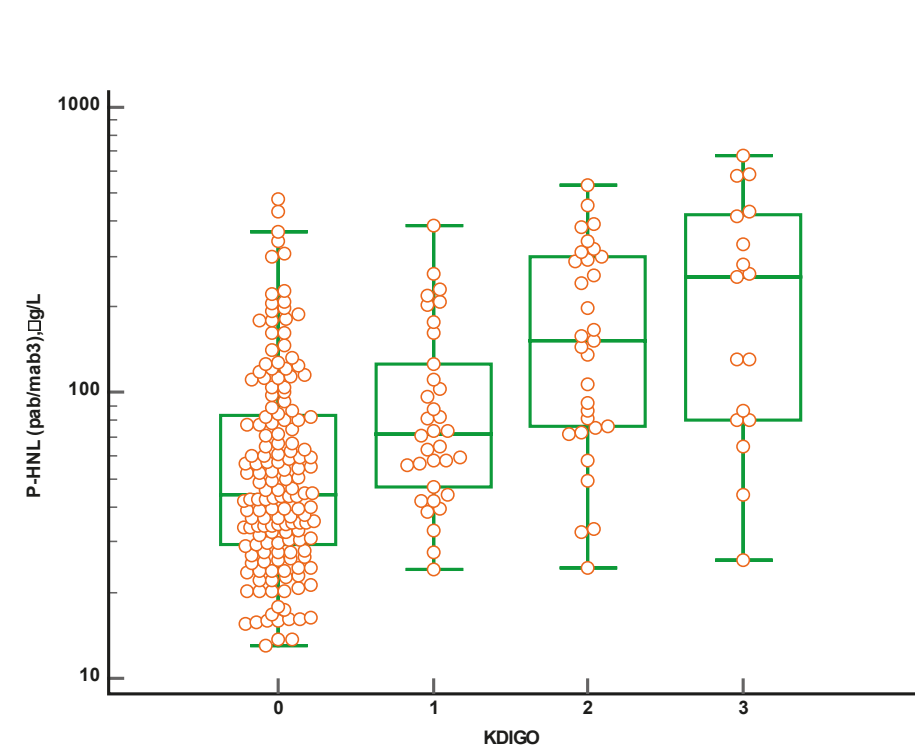
Plasma measurements of HNL, a better choice for outcome prediction in ICU-patients with and without sepsis.

In the PEAK-study on sepsis HNL was significantly ($p=0.003$) closer associated to subsequent AKI (RIFLE-score) development than NGAL.

The prediction of AKI (RIFLE score) in patients with sepsis (PEAK-study)



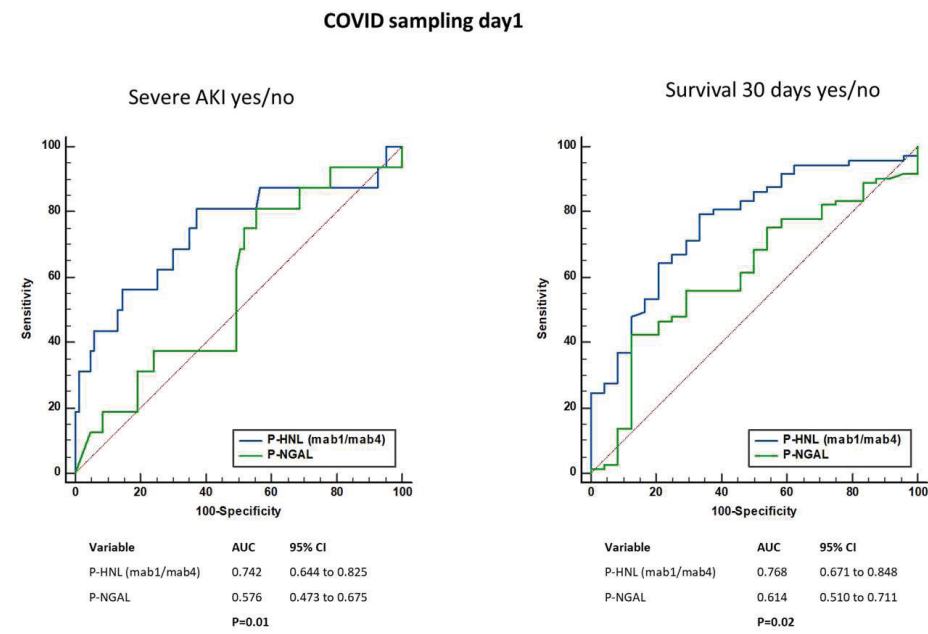
We also illustrate the close association to the development of AKI (KDIGO) in a mixed population of patients admitted to the ICU. Among the biomarkers measured plasma measurement of the HNL assay was independently related to the KDIGO-score



Variable	Coefficient	Std. Error	Wald	P
P-HNL Pab/765	0.0068737	0.0016432	17.4996	<0.0001
Constant	-1.41750	0.24629	33.1248	<0.0001

Variables not included in the model	
P-NGAL	
P-HNL 763/764	
P-HNL 763/765	
P-HNL 763/8F	
P-PCT	

The superiority of P-HNL 8F in comparison to NGAL in predicting AKI and survival is illustrated by ROC-analysis.



POCMATE™ AKI is available

POCMATE™ makes Point-of-Care testing simple, fast and accurate

The POCMATE™ HNL applications are available For Research Use Only (FRUO) but will be available as IVDR diagnostic products during 2027.



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+46-705349646 • info@diagnosticsdevelopment.com
Skolgatan 23, SE-753 12 Uppsala, Sweden
www.diagnosticsdevelopment.com