

Early detection of lung cancer by blood samples

DETECT-DK

Sara Witting Christensen Wen, MD, PhD

Onkologisk Afdeling, Sygehus Lillebælt

26. november 2024

Work packages (WP)

WP1: Early Detections of Lung Cancer



Clinical protocols (CP)

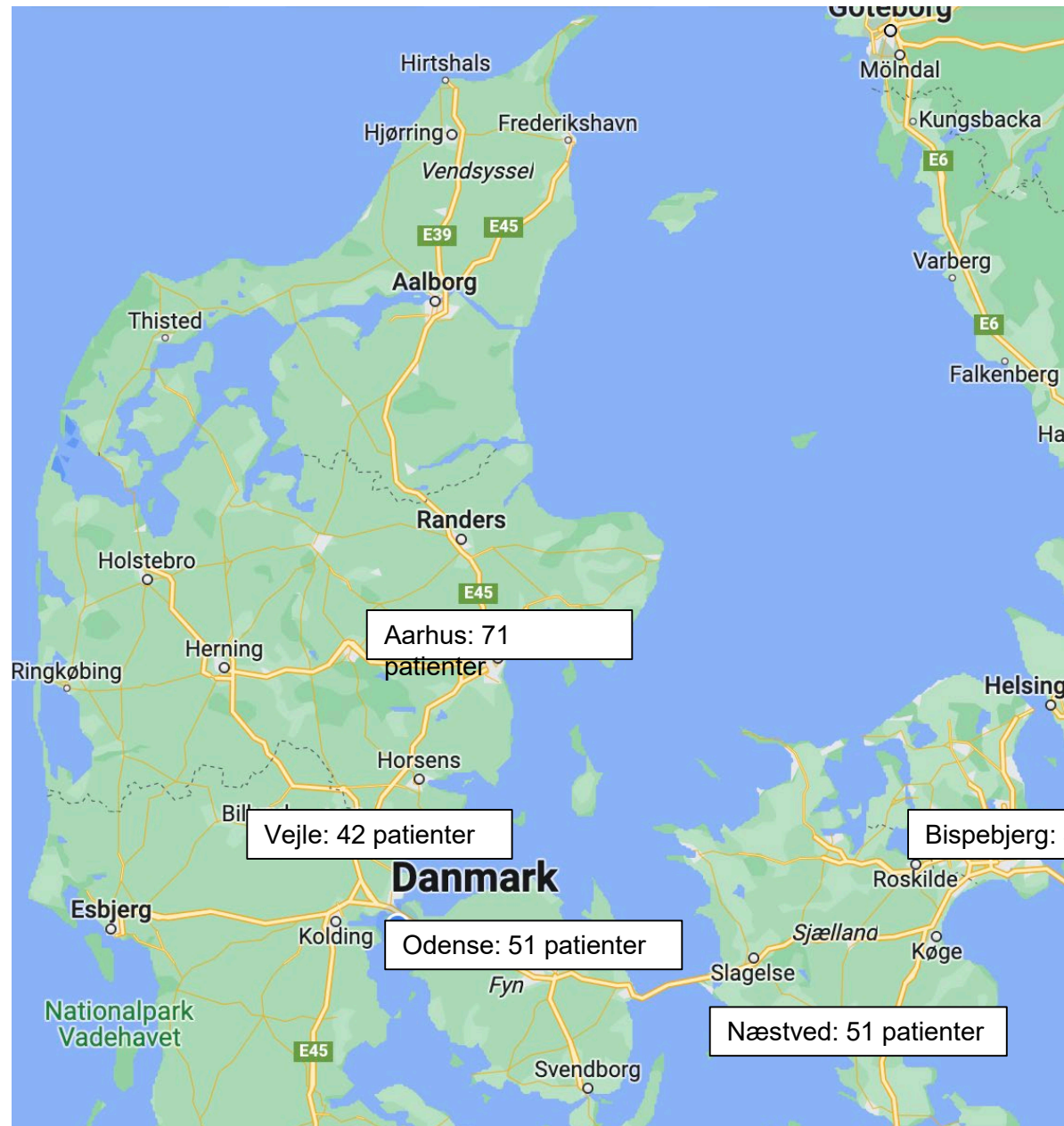
CP1 CT-screening

CP2 Blood sample screening

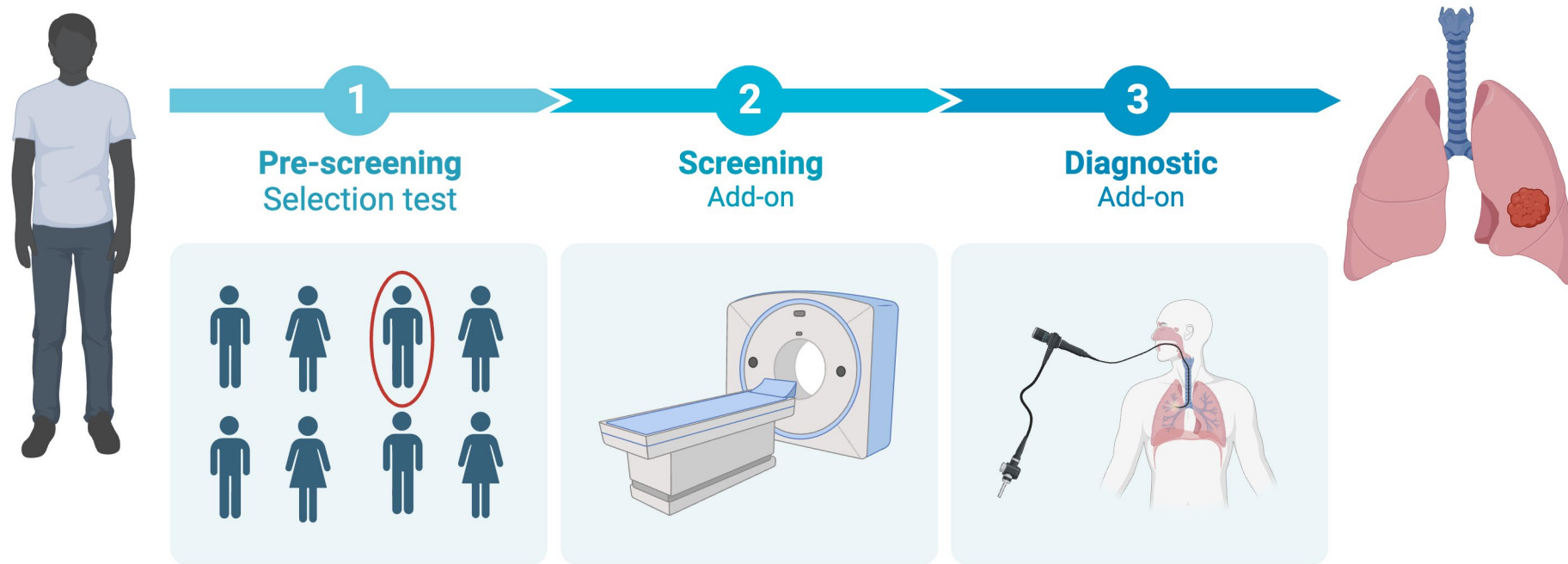


Early detection of lung cancer by blood samples
- A prospective national observational study

DETECT-DK

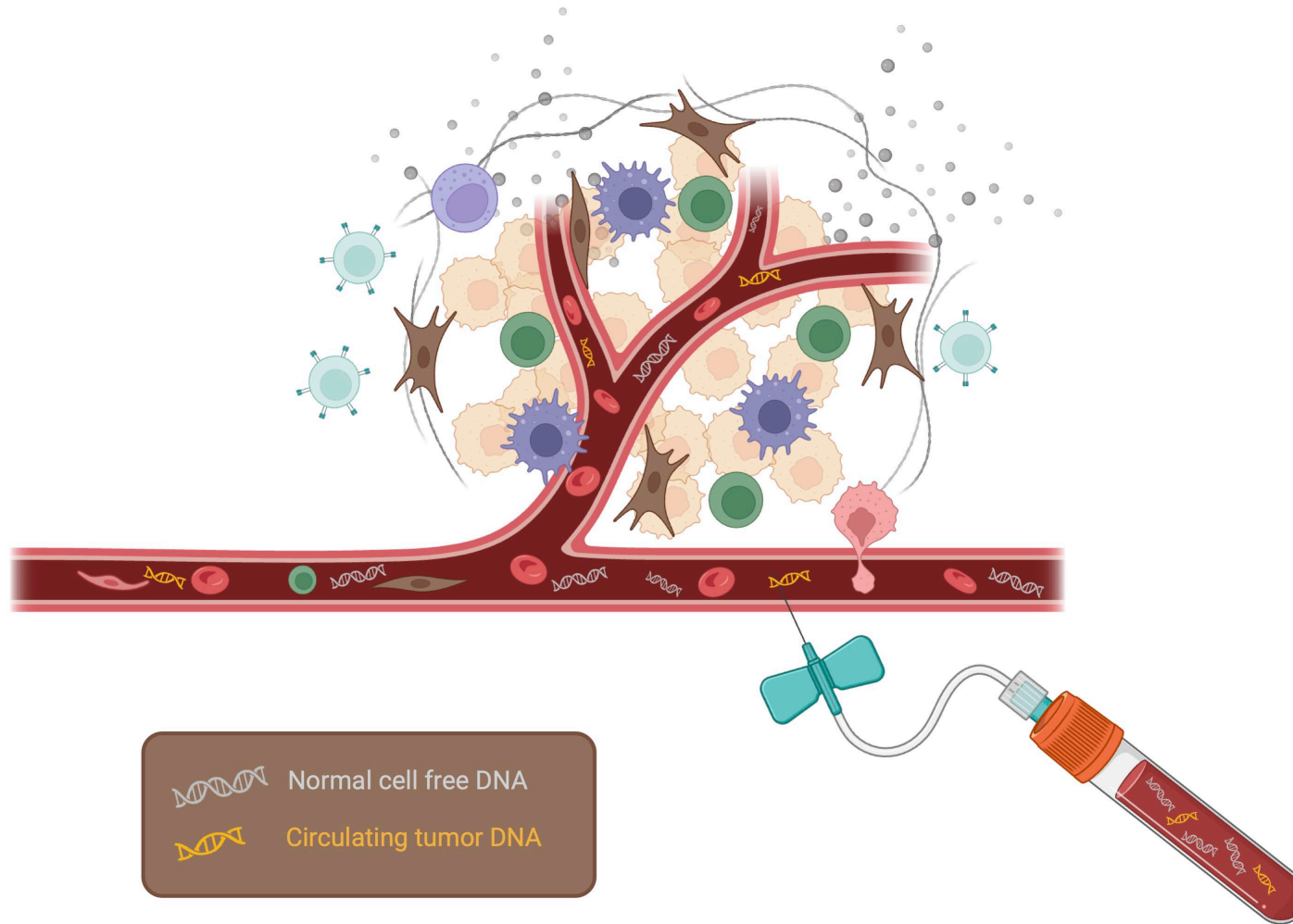


ANVENDELSE AF BIOMARKØRER



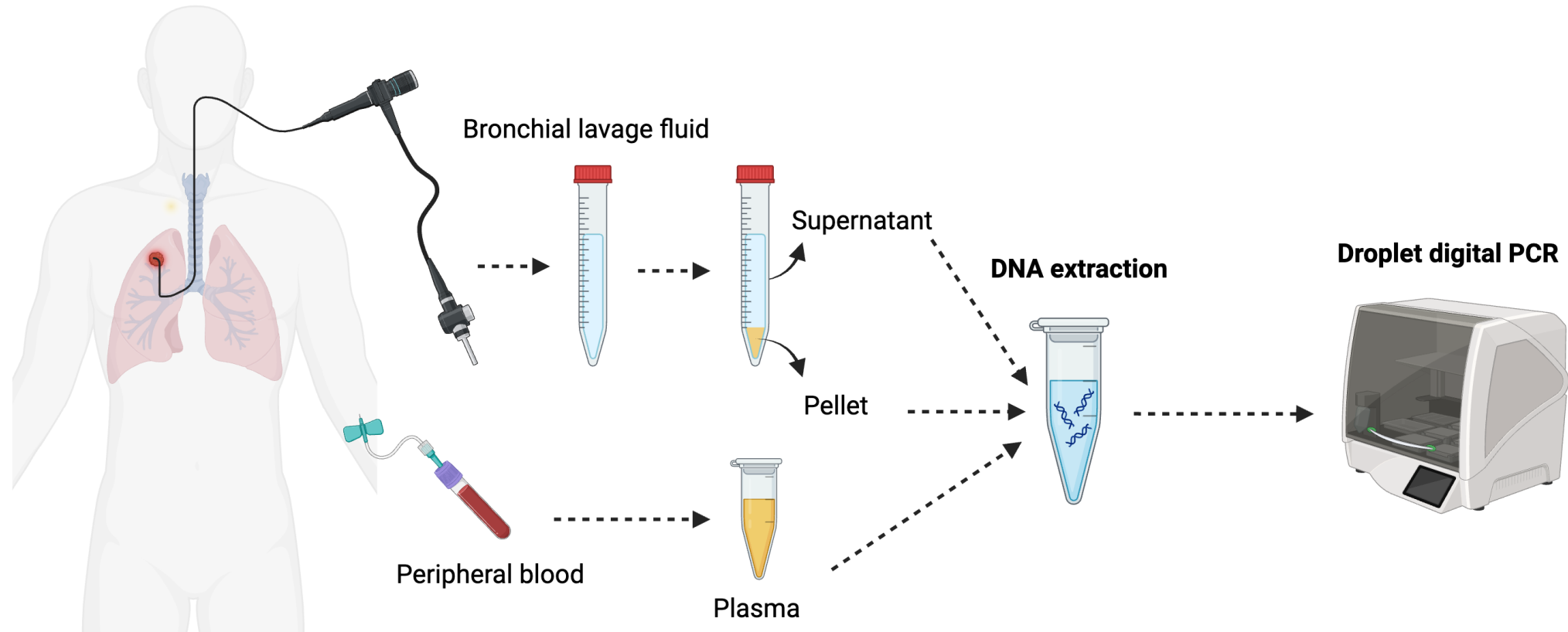
Created with BioRender.com

UDVÆLGELSE AF BIOMARKØRER



Created with BioRender.com



BIOLOGISK MATERIALE



Created with BioRender.com

Article

Validating Methylation-Specific PCR as a Diagnostic Tool

Sara W. C. Wen ^{1,2,*} , Rikke
Torben Frøstrup Hansen ^{1,2} 

Systematic Review

Cell Free Methylated Tumor DNA in Bronchial Lavage as an Additional Tool for Diagnosing Lung Cancer—A Systematic Review

Sara Witting Christensen Wen ^{1,2,*} , Jan Wen ³ , Torben Frøstrup Hansen ^{1,2} , Anders Jakobsen ^{1,2} 
and Ole Hilberg ^{2,†}

¹ Department of Oncology, Vejle Hospital, University Hospital of Southern Denmark, Beriderbakken 4, 7100 Vejle, Denmark; torben.hansen@rsyd.dk (T.F.H.); anders.jakobsen@rsyd.dk (A.J.)

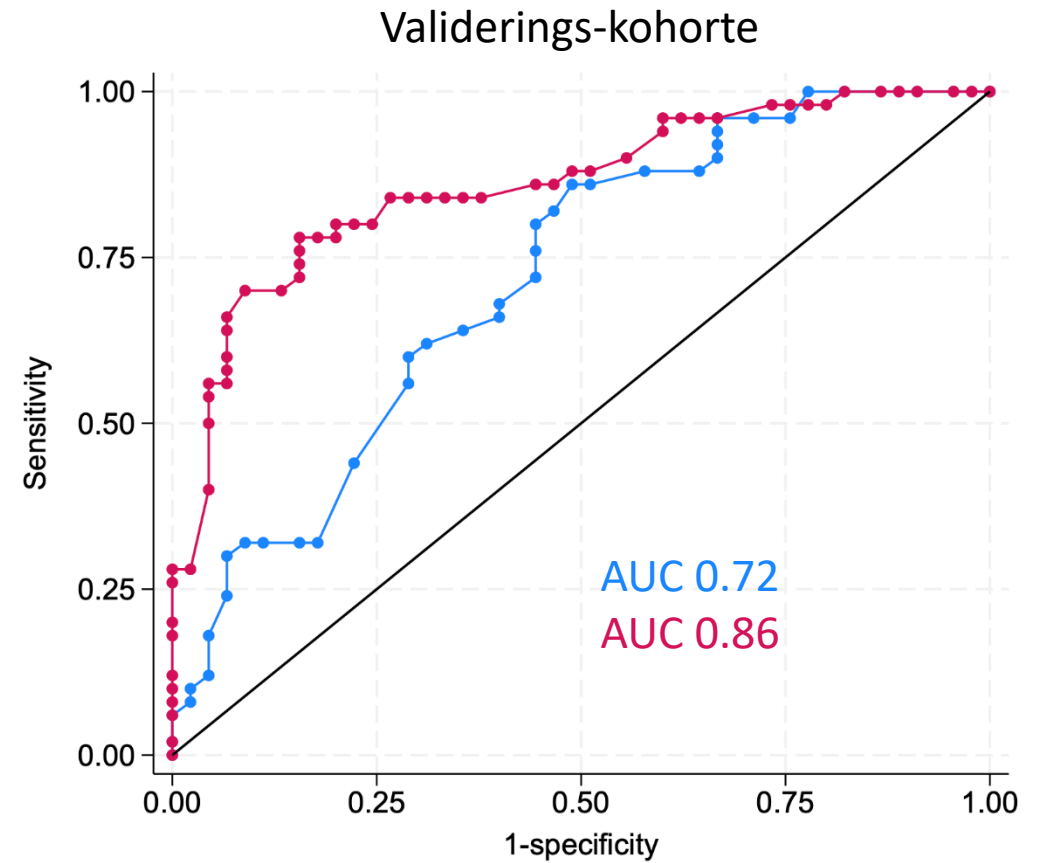
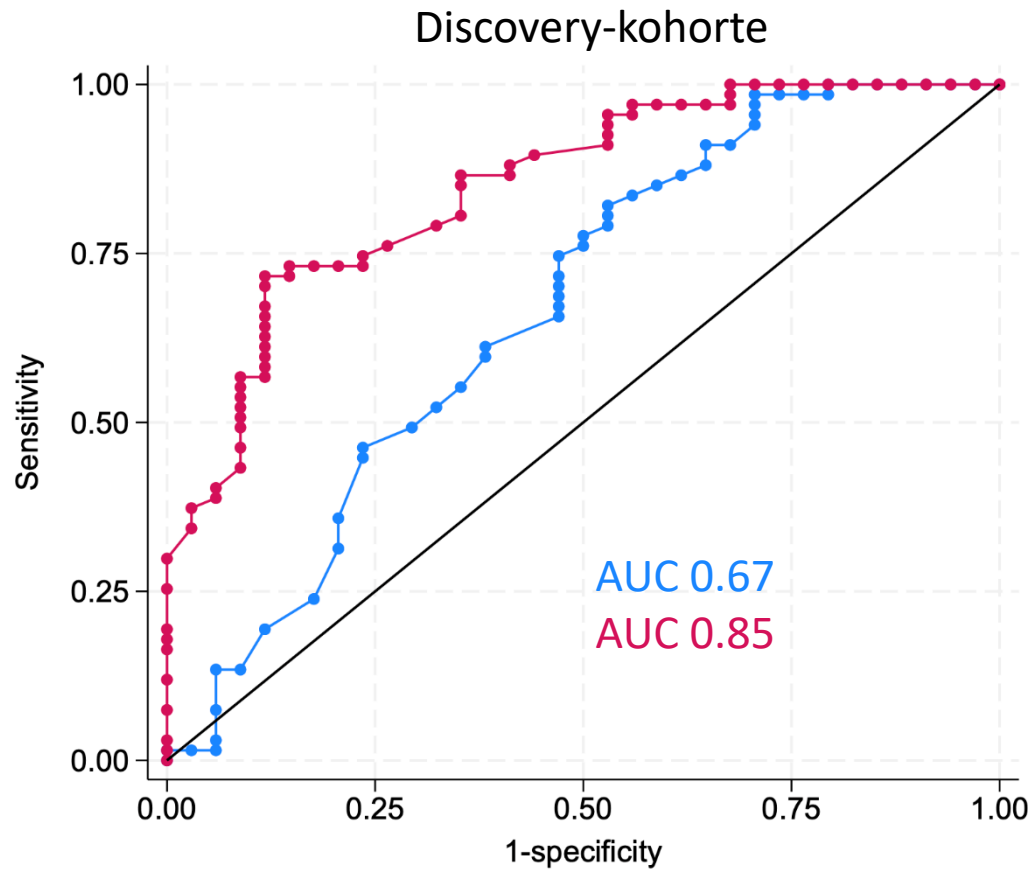
² Department of Regional Health Research, J.B. Winsloews Vej 19, 3rd Floor, 5000 Odense C, Denmark; ole.hilberg@rsyd.dk

³ General Practice, Region of Southern Denmark, Damhaven 12, 7100 Vejle, Denmark; jan@wen.dk

* Correspondence: sara.witting.christensen.wen@rsyd.dk

† This author belongs to Department of Medicine, Vejle Hospital, University Hospital of Southern Denmark.

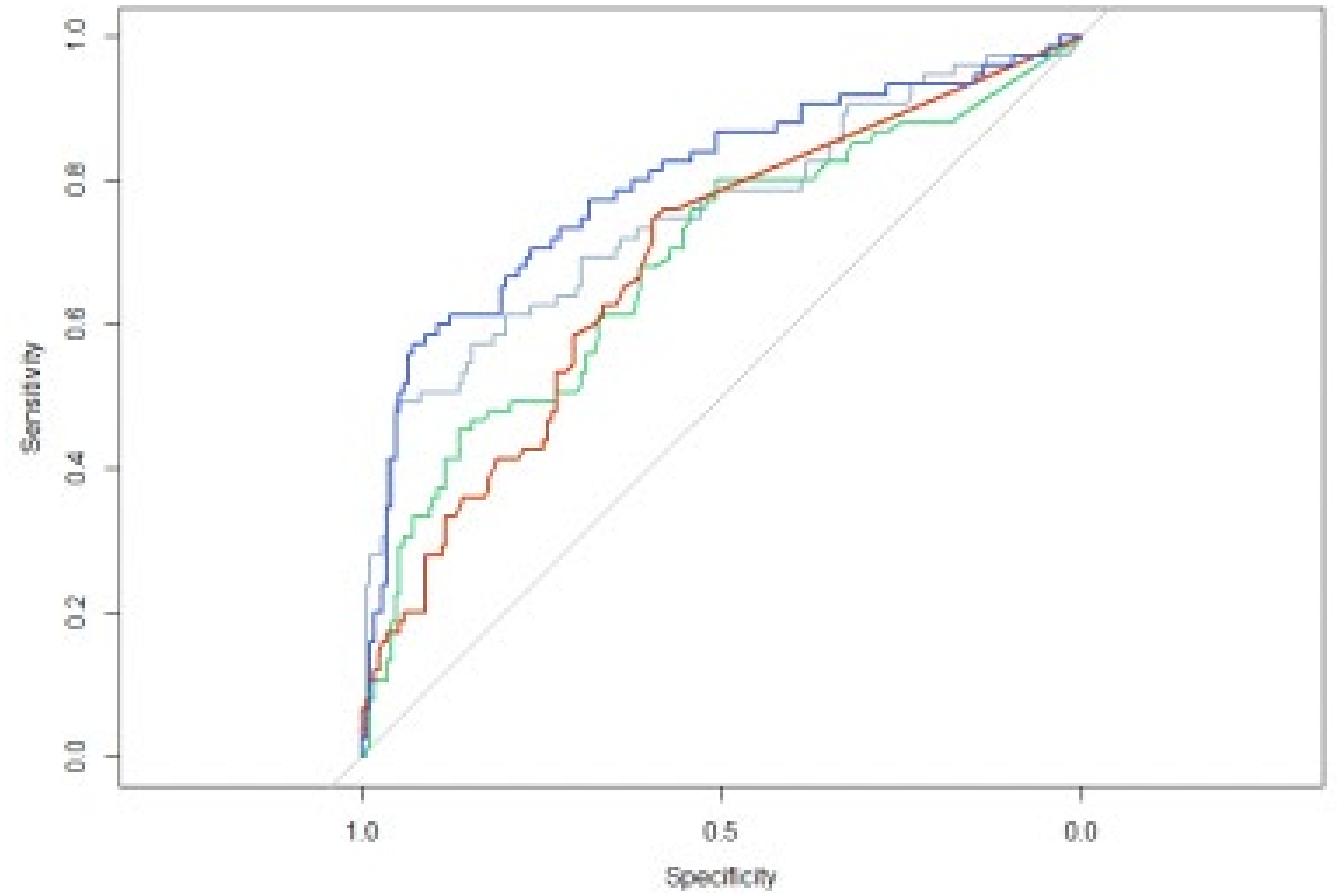
PILOT RESULTATER









Wen et al. Cancers, 2021

PILOT RESULTATER

	AUC [95% CI]
CA125	0.69 [0.61-0.76]
CEA	0.75 [0.68-0.82]
CYFRA 21-1	0.69 [0.62-0.76]
Biomarker panel	0.80 [0.73-0.86]



AKTUEL STATUS

-  Et års opfølgning på alle patienter.
-  Præliminære resultater præsenteret på Danske Kræftforskningsdage 2024.
-  Udvikling og test af multiplex digital PCR analyse.
-  Analyse af blodprøver med multiplex PCR.
-  Endelige opfølgningsdata.
-  Analyse af skyllevæske og cellepellet - formentligt start 2025.

AKTUEL STATUS

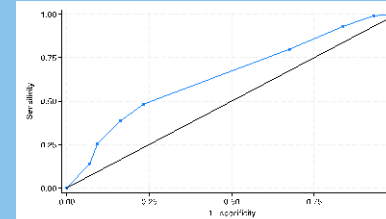
- ✓ Et års opfølgning på alle
- ✓ Præliminære resultater
- ✓ Udvikling og test af mul
- ✓ Analyse af blodprøver r
- ✓ Endelige opfølgningsda
- ✓ Analyse af skyllevæske

The diagnostic value of blood C-reactive protein, lactate dehydrogenase, and hemoglobin in a high-risk cohort undergoing diagnostic workup for lung cancer: The first results from DETECT-DK

Wen, S.W.C.^{1,2}, Nederby, L.³, Juul, A.D.^{4,5}, Laursen, C.B.^{5,6}, Rasmussen, T.R.^{7,8}, Kristjansen, P.⁹, Bodtger, U.¹⁰, Hansen, T.F.^{1,3}, Borg, M.¹¹, Hillberg, O.^{2,11}

- 1) Department of Oncology, Lillebaelt Hospital, Vejle.
- 2) Department of Regional Health Research, University of Southern Denmark.
- 3) Department of Biochemistry and Immunology, Lillebaelt Hospital, Vejle.
- 4) Department of Internal Medicine, Odense University Hospital Sønderborg.
- 5) Odense Respiratory Research Unit, Department of Clinical Research, University of Southern Denmark.
- 6) Institute of Clinical Research, University of Southern Denmark.
- 7) Department of Respiratory Diseases and Allergology, Aarhus University Hospital.
- 8) Institute of Clinical Research, Aarhus University.
- 9) Department of Respiratory Medicine and Infectious Diseases, Bispebjerg Hospital.
- 10) Respiratory Research Unit, Dep. of Respiratory Medicine, Zealand University Hospital.
- 11) Department of Medicine, Lillebaelt Hospital, Vejle.

CONCLUSION
Simple blood biomarkers do not have added diagnostic value in patients suspected of lung cancer.



ROC analysis of a multiple logistic regression model comprising CRP, LDH, and HGB (N=157). Area under the ROC curve = 0.6445

MULTIPLE LOGISTIC REGRESSION MODEL		
Biomarker	Odds ratio	P-value
CRP ≥10 mg/L	3.77	0.003*
LDH ≥230 units/L	0.94	0.879
HGB <7.8 mmol/L	1.70	0.231

INTRODUCTION
Lung cancer is the leading cause of cancer related death in Denmark. Biomarkers may be useful as a diagnostic add-on.
We evaluated the diagnostic value of three standard blood biomarkers.

BIOMARKERS
Venous blood C-reactive protein (CRP), lactate dehydrogenase (LDH), and hemoglobin (HGB) were analyzed according to standard practice.

DATA ANALYSIS

Biomarker levels

Biomarker	Median (interquartile range)
CRP, mg/L (N=229)	5 (3-22)
LDH, units/L (N=159)	210 (179-244)
HGB, mmol/L (N=229)	8.5 (7.7-9.2)

Diagnostic properties

Variable	Sens	Spec	LR+	LR-
CRP ≥10 mg/L	0.46	0.81	2.34	0.68
LDH ≥230 units/L	0.36	0.67	1.10	0.95
HGB ≤7.8 mmol/L	0.28	0.75	1.17	0.95

Sens, sensitivity; Spec, specificity; LR+, positive likelihood ratio; LR-, negative likelihood ratio.

Simple logistic regression

Variable	Odds ratio (95% CI)	P-value
CRP ≥10 mg/L	3.46 (1.78-6.72)	<0.001*
LDH >230 units/L	1.10 (0.52-2.33)	0.793
HGB ≤7.8 mmol/L	0.81 (0.43-1.55)	0.529







Continuous variables are presented as median (interquartile range). Categorical variables are presented as number (percentage).

PATIENT CHARACTERISTICS

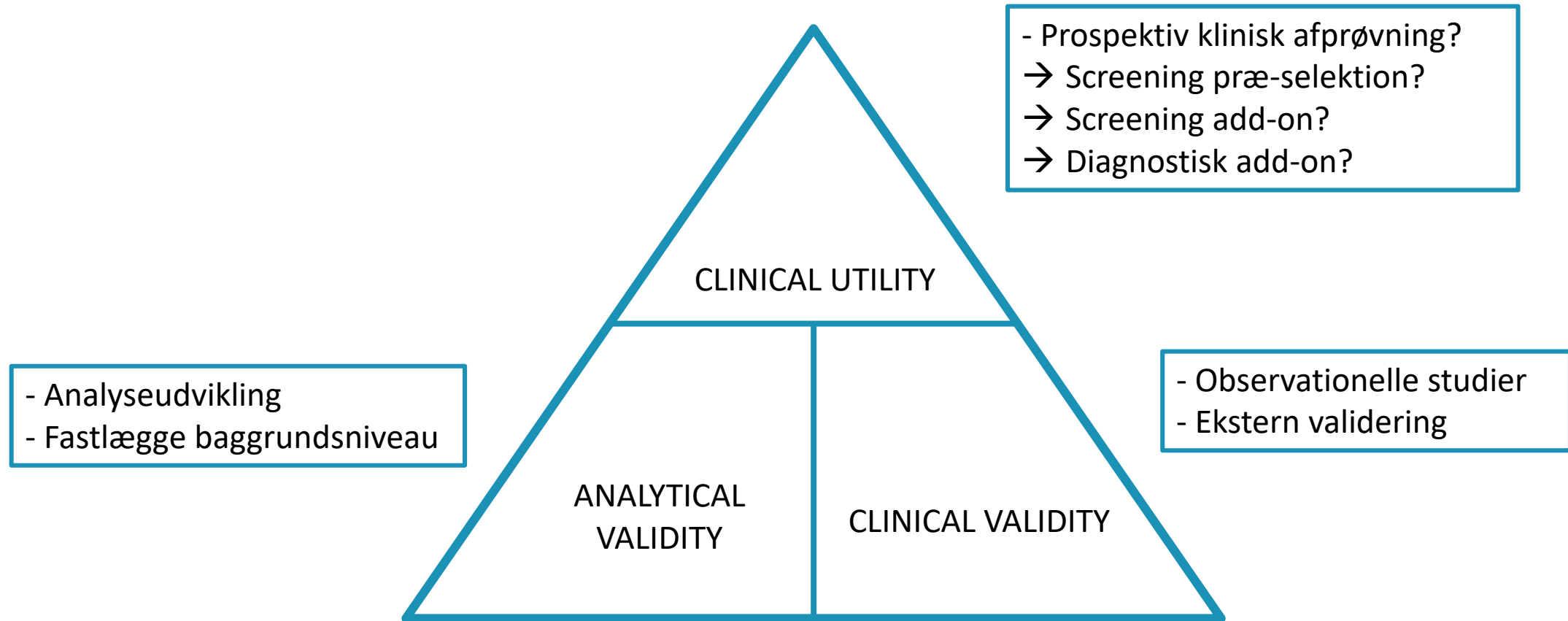
N	265
Age	71 (62-77)
Sex, female	120 (45.6%)
Performance status	
0	139 (53.5%)
1	82 (31.5%)
2	33 (12.7%)
3	6 (2.3%)
Smoking status (N=227)	
Never	29 (10.9%)
Former	147 (55.5%)
Current	89 (33.6%)
Pack years	40 (25-50)
Diagnosis	
Benign	82 (30.9%)
Lung cancer	174 (65.7%)
Cancer, other origin	9 (3.4%)

Continuous variables are presented as median (interquartile range). Categorical variables are presented as number (percentage).

AKTUEL STATUS

-  Et års opfølgning på alle patienter.
-  Præliminære resultater præsenteret på Danske Kræftforskningsdage 2024.
-  Udvikling og test af multiplex digital PCR analyse.
-  Analyse af blodprøver med multiplex PCR.
-  Endelige opfølgningsdata.
-  Analyse af skyllevæske og cellepellet - formentligt start 2025.

PERSPEKTIVER OG FREMTIDIG FORSKNING



Mange tak for opmærksomheden.

Spørgsmål?

