Technology Offer

Ref.-No. M07/22

Predictive level of PD-L1 on microvesicles in the evaluation whether being a responder to a treatment of NSCLC

Introduction

Lung cancer is still the leading cause of cancer-related death worldwide. For patients with advanced stage non-small cell lung cancer (NSCLC), immune checkpoint inhibitors (ICI) such as antibodies against programmed cell death protein 1 (PD-1) and programmed cell death ligand 1 (PD-L1) have significantly improved state-of-the-art lung cancer treatment.

NSCLC patients with high PD-L1 expression on tumor cells (tumor proportion score, TPS) or on tumor-infiltrating immune cells (combined positive score, CPS) benefit from a single-agent immunotherapy compared to standard platinum-based chemotherapy. However, so far there is no biomarker to predict response to immunotherapy.

Invention

The present invention relates to a novel method of evaluating whether a subject already suffering from NSCLC will respond to a treatment of NSCLC comprising immunotherapy. The current algorithm for therapeutic decisions in stage IV NSCLC patients without driver mutations is based on PD-L1 expression in the tumor tissue (TPS, CPS). According to that, patients with high PD-L1 expression (TPS $\geq$ 50%) can either receive single-agent immunotherapy or combined chemoimmunotherapy, whereas patients with low (1-49%) or negative (<1%) PD-L1 expression are usually treated with combined chemoimmunotherapy. Our novel approach aims to measure PD-L1 expression on large extracellular vesicles (lEV) in a peripheral blood (PB) sample obtained from a subject suffering from NSCLC who has not yet been treated. For those patients with negative (<1%) or low (1-49%) tissue PD-L1 expression, the lEV PD-L1 level is a novel predictive biomarker for response to immunotherapy. If said level of PD-L1-positive lEVs is increased relative to corresponding levels of PD-L1-positive lEVs in control PB samples, the said subject will be evaluated as a responder to immunotherapy. Therefore, this method allows the predictive evaluation of NSCLC patients with low or negative tissue PD-L1 expression, whether they will benefit from immunotherapy or not, implementing the need for a closer monitoring of those patients.

Advantages of the invention

- For stage IV NSCLC patients with low (1-49%) or negative (<1%) tissue PD-L1 expression, a single liquid biopsy prior to therapy and determination of lEV PD-L1 expression can act as a predictive biomarker to the response of immunotherapy.
- There is no need for evaluation of further samples during the treatment.
- Selection of patients that will benefit from immunotherapy and closer monitoring of those patients.

Patent situation

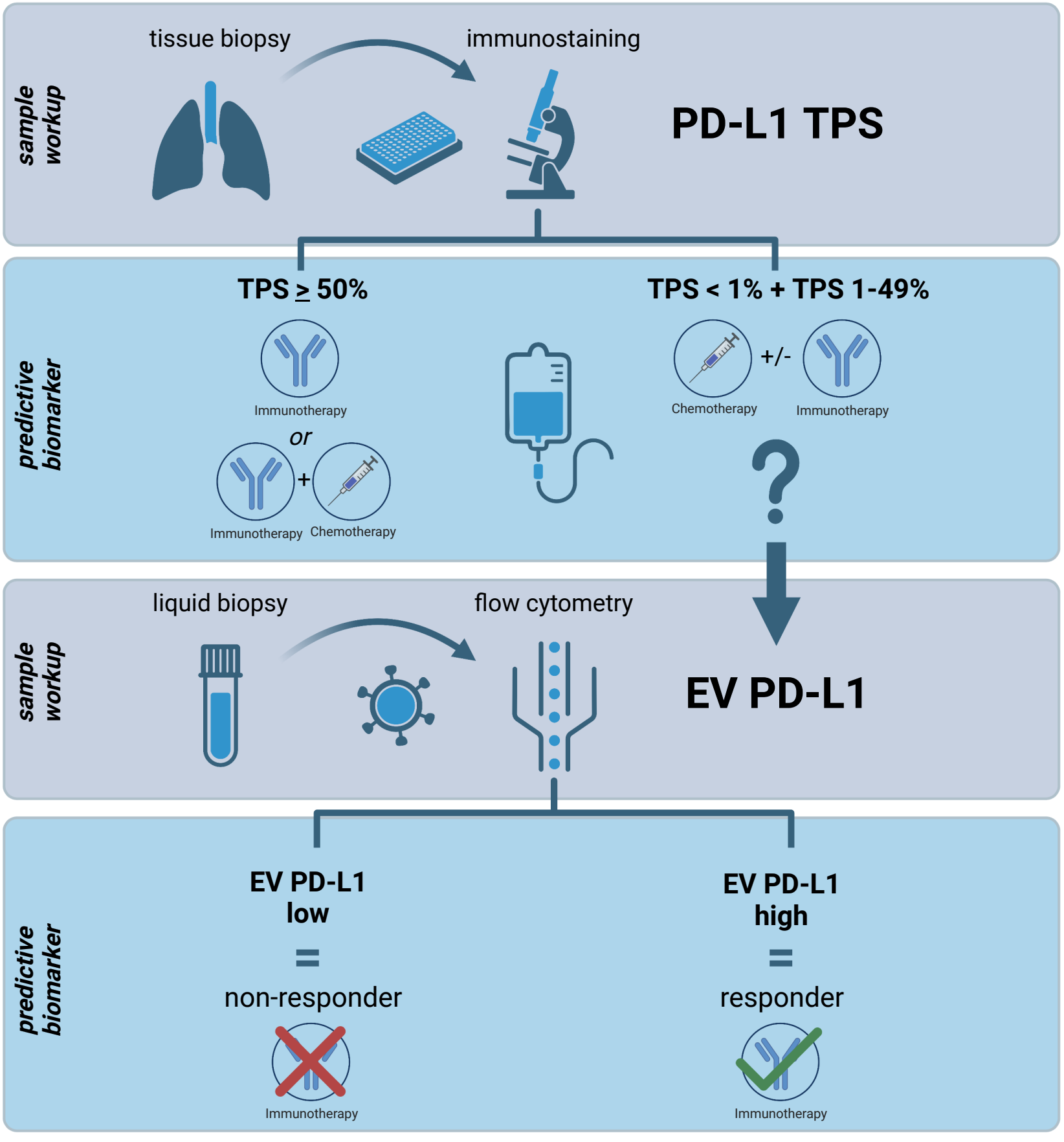
Patent application filed in Europe.

For further detailed information please contact:

Clinic Invent

Dr. Marion Willenborg
Albert-Schweitzer-Campus 1,
Gebäude D3
D-48149 Muenster, Germany

Tel. +49-(0)251/83 58 904
marion.willenborg@ukmuenster.de


sample workup
tissue biopsy
immunostaining
PD-L1 TPS
predictive biomarker
TPS ≥ 50%
Immunotherapy
or
Immunotherapy
Chemotherapy
TPS < 1% + TPS 1-49%
Chemotherapy
+/-
Immunotherapy
?
sample workup
liquid biopsy
flow cytometry
EV PD-L1
predictive biomarker
EV PD-L1 low
=
non-responder
Immunotherapy
EV PD-L1 high
=
responder
Immunotherapy