

# I3LUNG: Integrative Science, Intelligent Data Platform for Individualized LUNG Cancer Care with Immunotherapy – update: AI based prediction

I. Watermann<sup>1</sup>, M. Szewczyk<sup>1</sup>, T. Olchers<sup>1</sup>, H. Richter<sup>1</sup>, M. Garassino<sup>2</sup>, A. Prelaj<sup>3</sup>, M. Reck<sup>1</sup>

<sup>1</sup>LungenClinic Grosshansdorf, Großhansdorf, Germany, <sup>2</sup>Department of Medicine, Section of Hematology and Oncology, University of Chicago, Chicago, United States, <sup>3</sup>Department of Medical Oncology, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy

## Summary / Abstract

### Data generation for AI based prediction of IO based therapies

For the treatment of advanced, non-oncogenic driven non-small cell lung cancer (NSCLC), Immuncheckpoint-Inhibitors (ICIs) alone or in combination with chemotherapy are currently the standard of care. However, Programmed death ligand 1 (PD-L1) expression is still the only biomarker with limited value for indicating predictive response. Therefore, identification of patients who might profit from ICI is still challenging, additional biomarkers are strongly required.

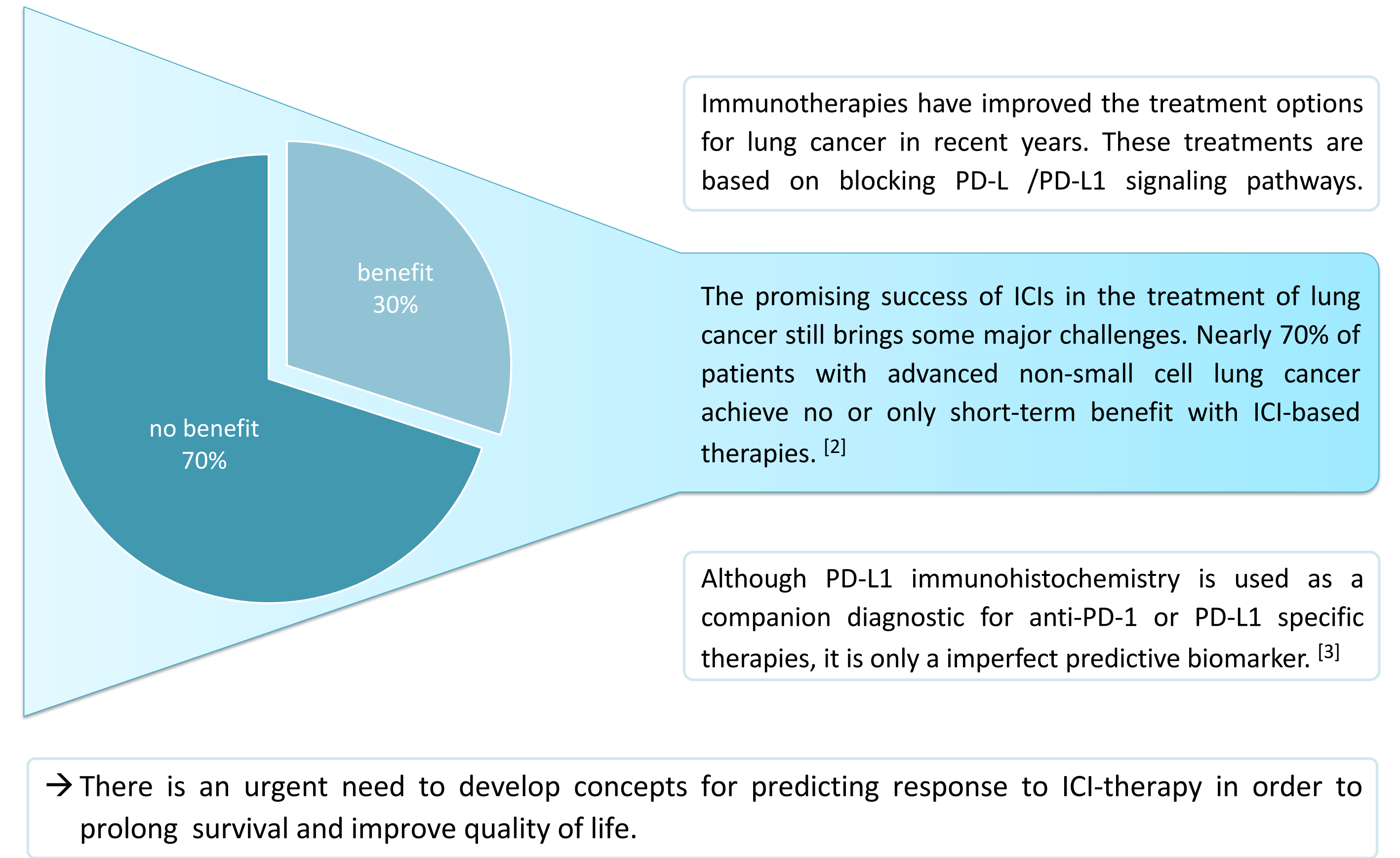
With the help of Artificial intelligence (AI), multi source data including clinical- and multi-omics data, the discovery of biomarker signatures predicting the efficacy of ICIs in patients with NSCLC might be possible. The multinational, multicentre academic I3Lung-study consists of a retrospective part for training the AI and a prospective part for validation.

To date, clinical data of more than 2.000 patients who received ICI have been already collected, including molecular characteristics, radiomics and digital pathology data. Now, processing of the complex data sets will be performed for generating the AI exploitation of predictive signals and preparing the validation in the prospective cohort.

The prospective cohort will consist of 200 patients for training and development of predictive. More than 50 patients have been enrolled so far with available tumor material for multi-omic analysis in addition to more than 100 non-omics patients (real world data cohort).

## Introduction / Background

### Response to immunotherapy - reliable biomarkers needed



## Objectives

### AI based Predictive Tools and Decision AID System

The aim of this study is to develop an integrated AI-based predictive tool, for guiding IO administration to optimize best possible personalized therapies for patients with advanced NSCLC.

#### Retrospective cohort: 2000 patients

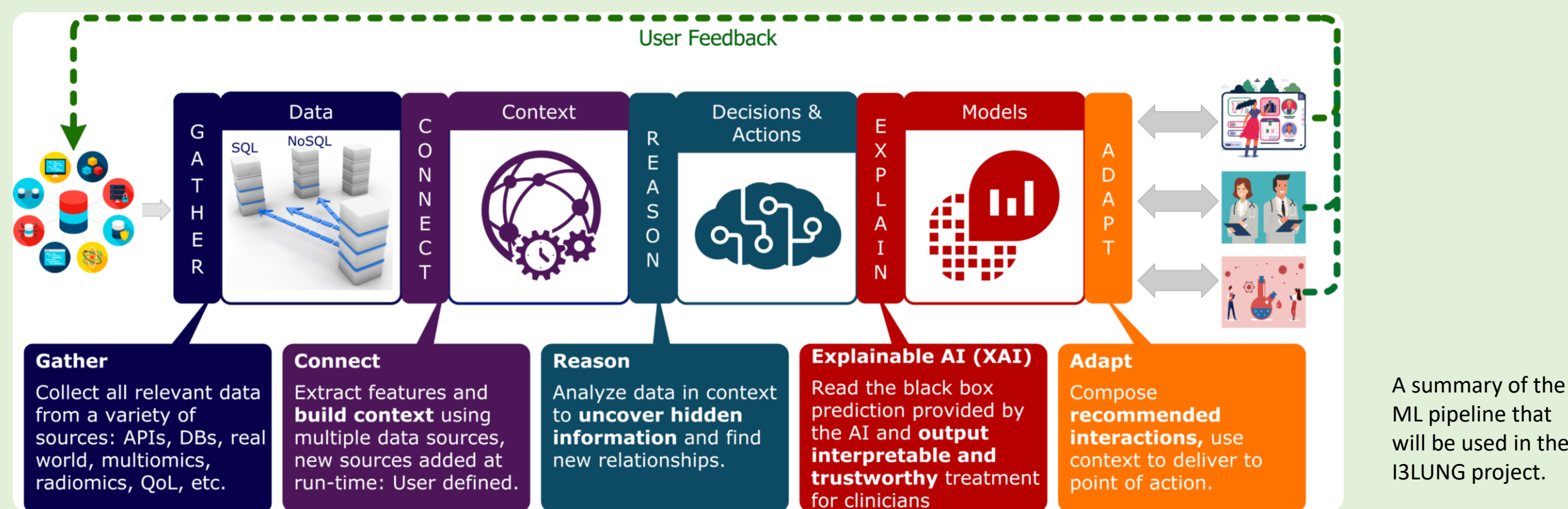
- Valorization of existing RW and generation of new RW data
- Training and development of predictive algorithms

#### Multi-omics prospective cohort: 200 patients

- integrating diverse -omic information

#### Psychological Study

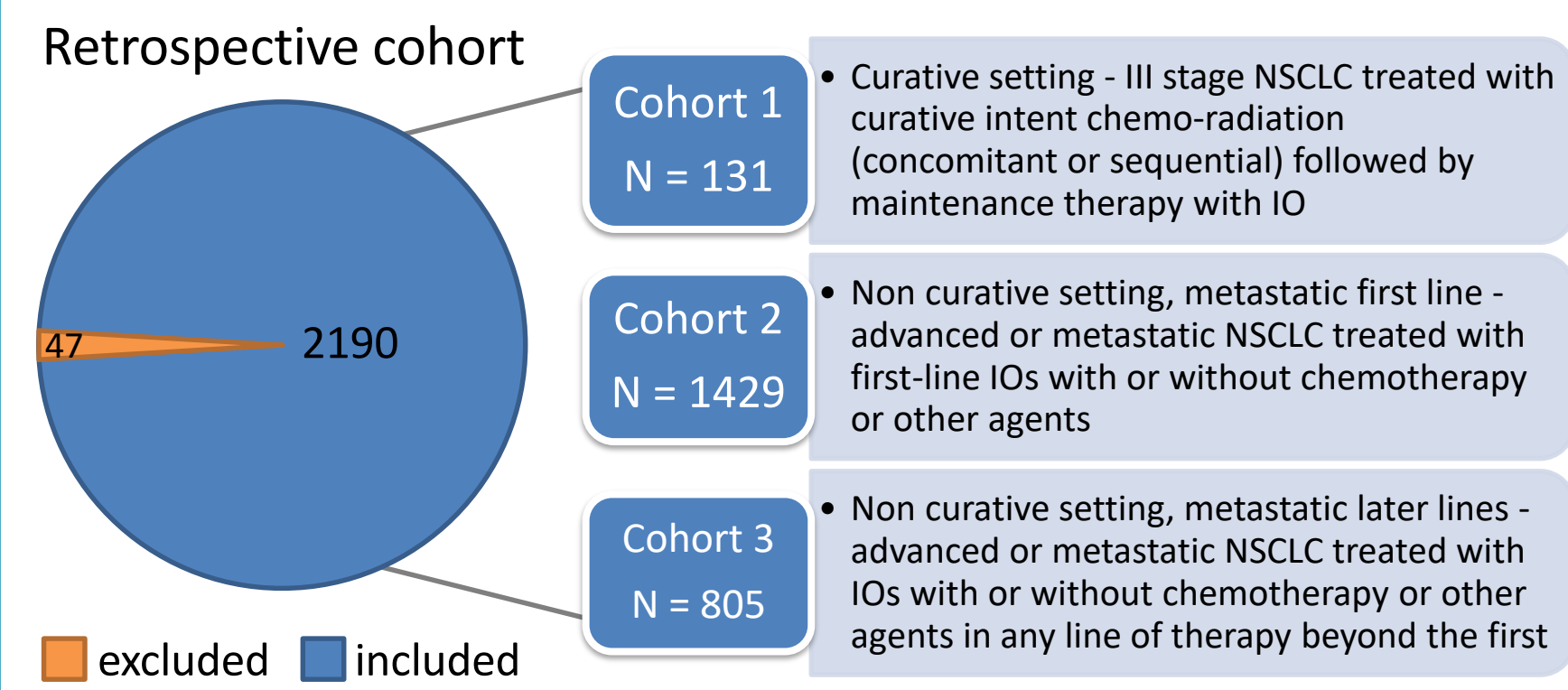
- Defining the impact of AI-driven decisions on patients and identifying their preferences
  - Empowering patients through an individualised patient decision support system for co-decision making
- Physician tool: comparing AI with Human Intuition
  - Supporting the decision-making process of physicians through an AI-powered decision support that provides easy and immediate access to predictive models [1]



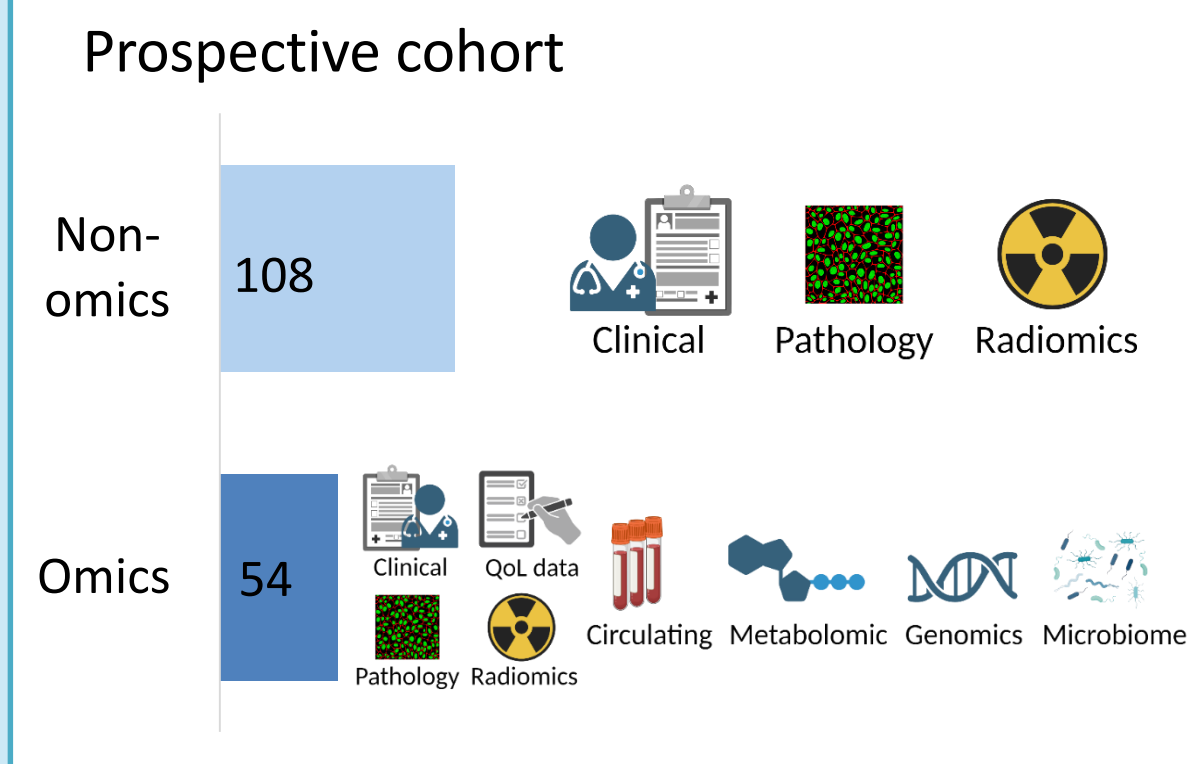
## Analysis

### Update – enrolment, data collection and analysis

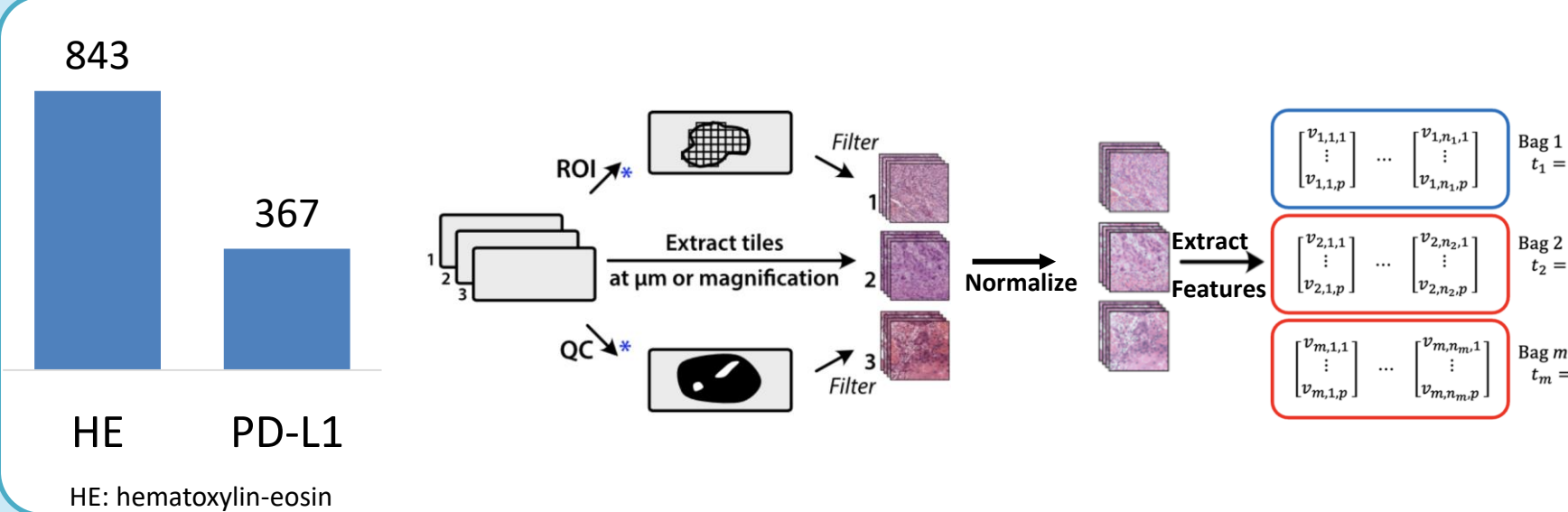
#### Retrospective cohort size: 2000 - enrolment completed



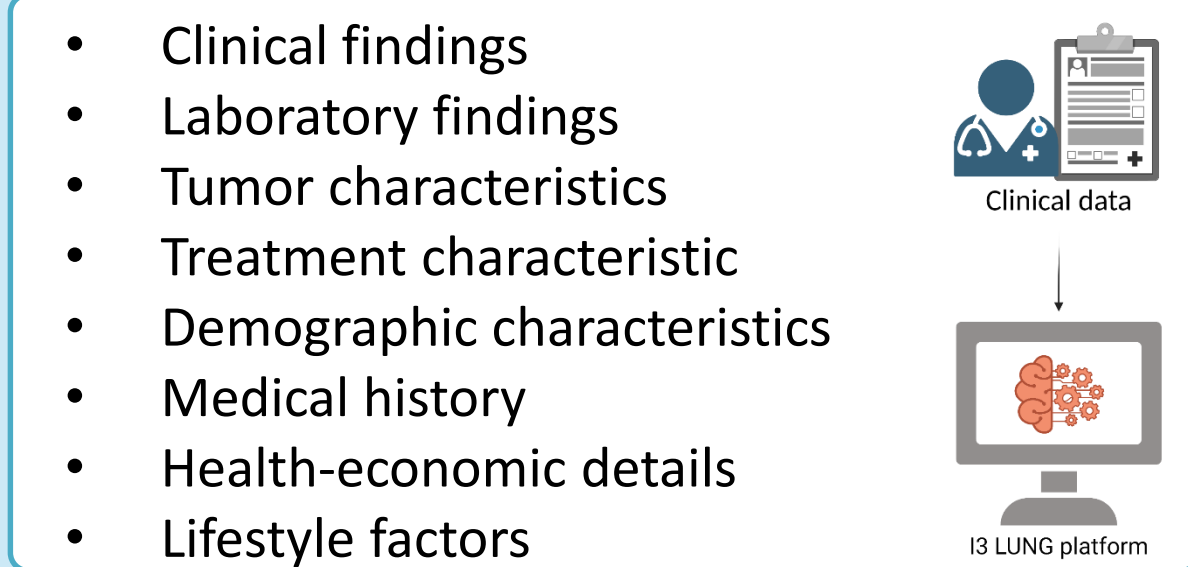
#### Prospective cohort - ongoing



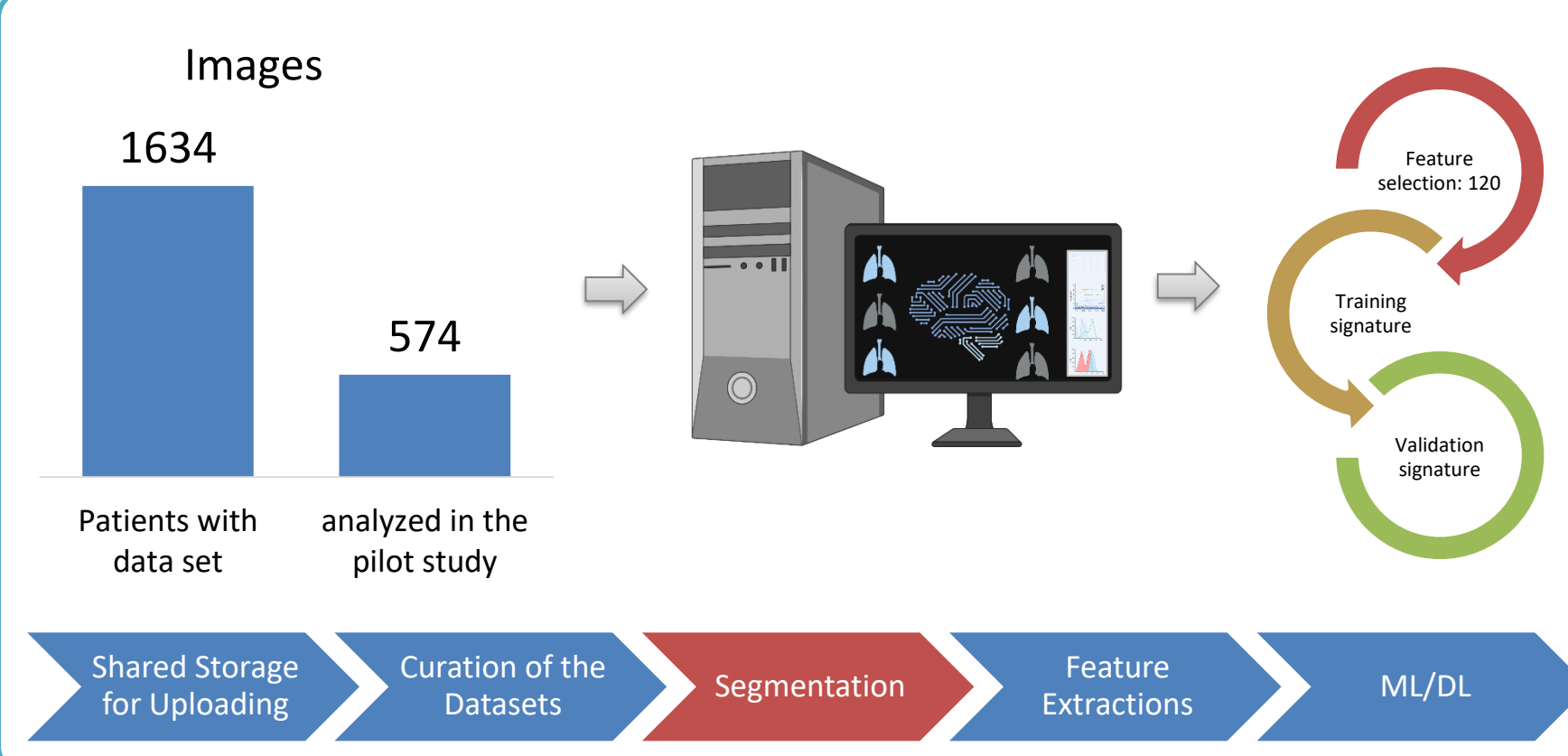
#### Digital pathology images



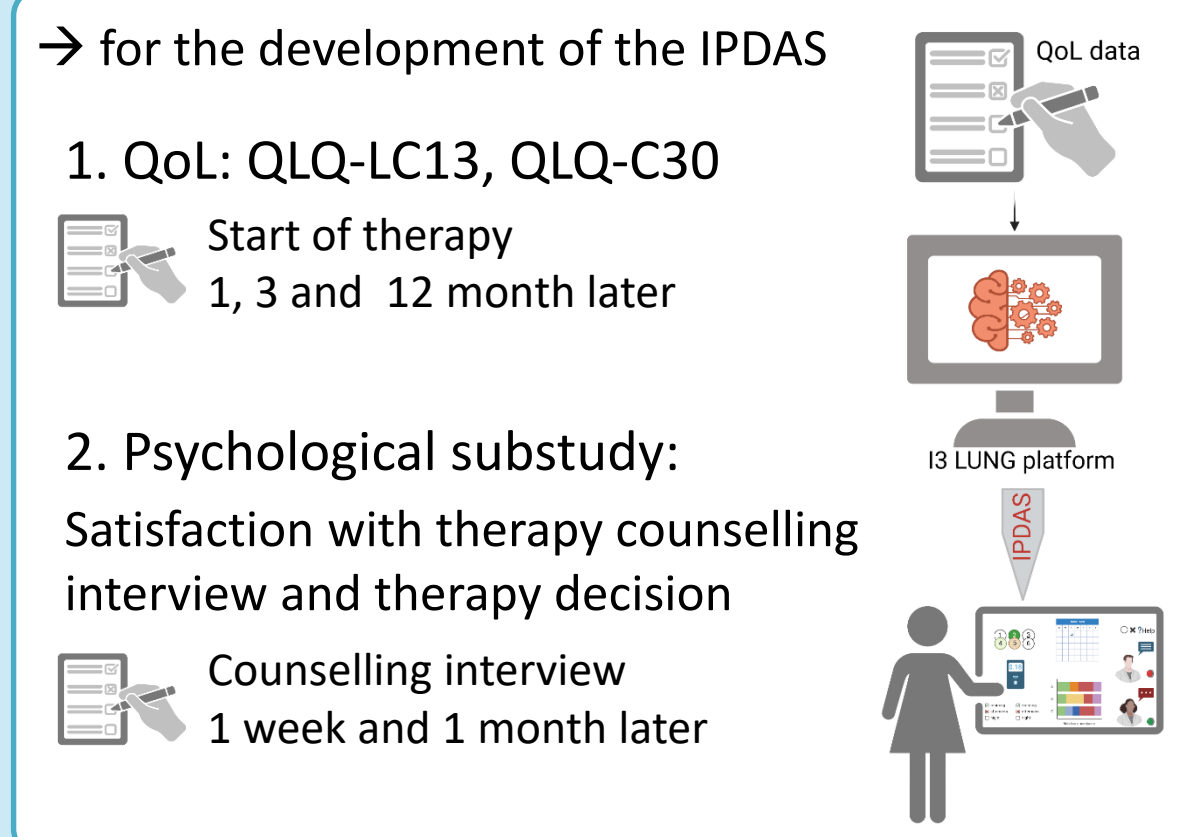
#### Clinical Data



#### Radiology images



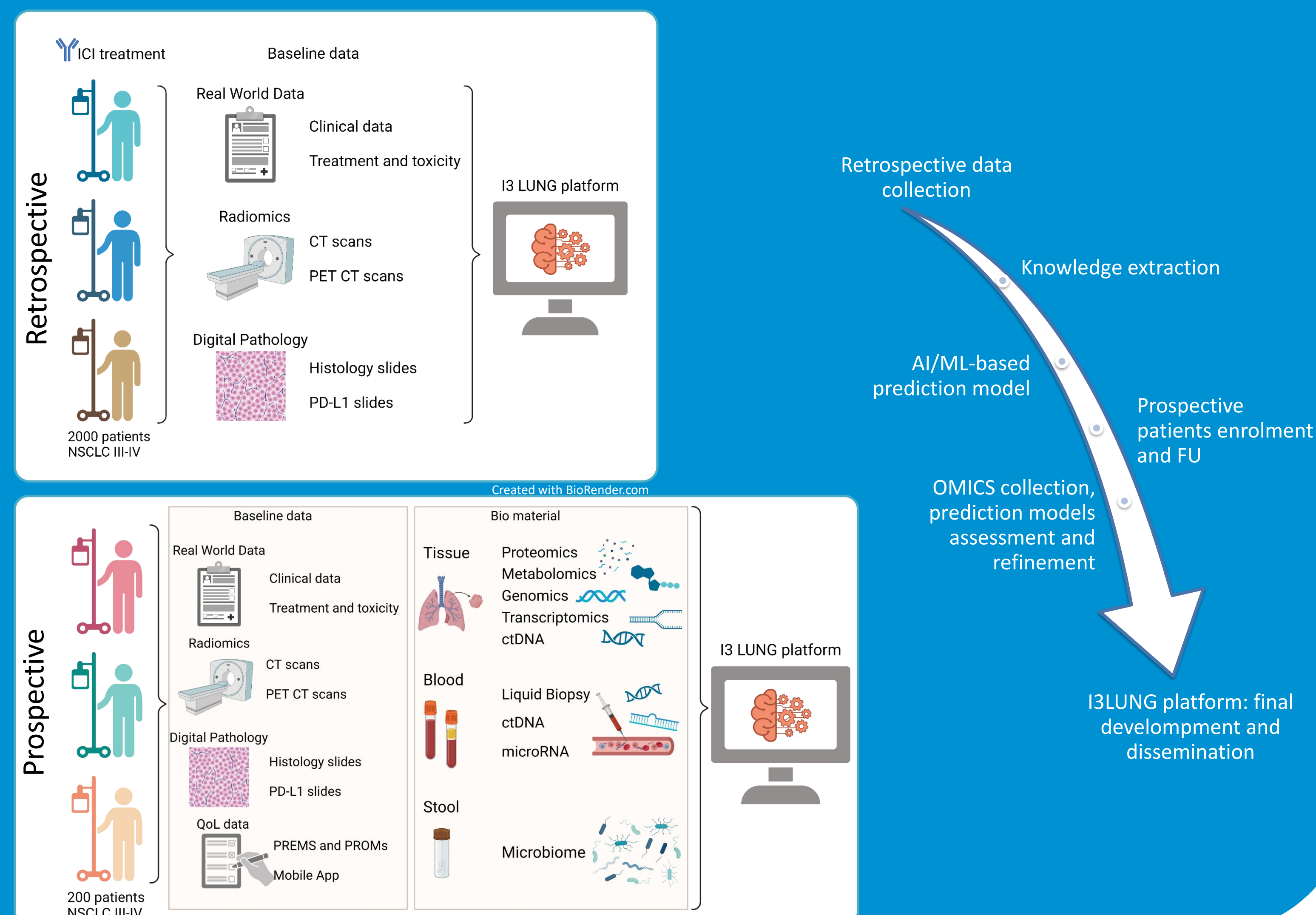
#### Questionnaires



## Material & Methods

### Study Design

- non-interventional observational study
- NSCLC patients, stage IIIB – IV, IO-based therapy



## References

- [1] Prelaj A, Ganzielli M, Trovo F, Roisman LC, Pedrocchi ALG, Kosta S, et al., (2023). The EU-funded I3LUNG Project: Integrative Science, Intelligent Data Platform for Individualized LUNG Cancer Care With Immunotherapy, Clin Lung Cancer
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- [3] Mino-Kenudson M, Schalper K, Cooper W, Dacic S, Hirsch FR, Jain D, et al. Predictive Biomarkers for Immunotherapy in Lung Cancer: Perspective From the International Association for the Study of Lung Cancer Pathology Committee. Journal of Thoracic Oncology. 2022;17(12):1335-54.

## Acknowledgement

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HaDEA. Neither the European Union nor the granting authority can be held responsible for them.

## Contact

Prof. Dr. Martin Reck  
E-Mail: m.reck@lungenclinic.de