



| SPHN SPO-NDS | Zurich | 03.05.2022

# Swiss Personalized Oncology National Data Stream SPHN Project

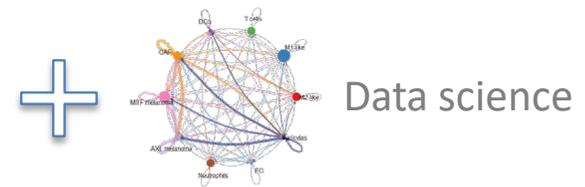
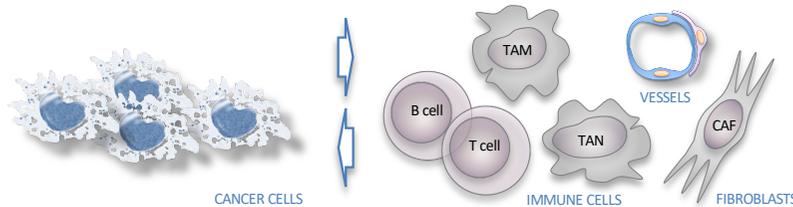
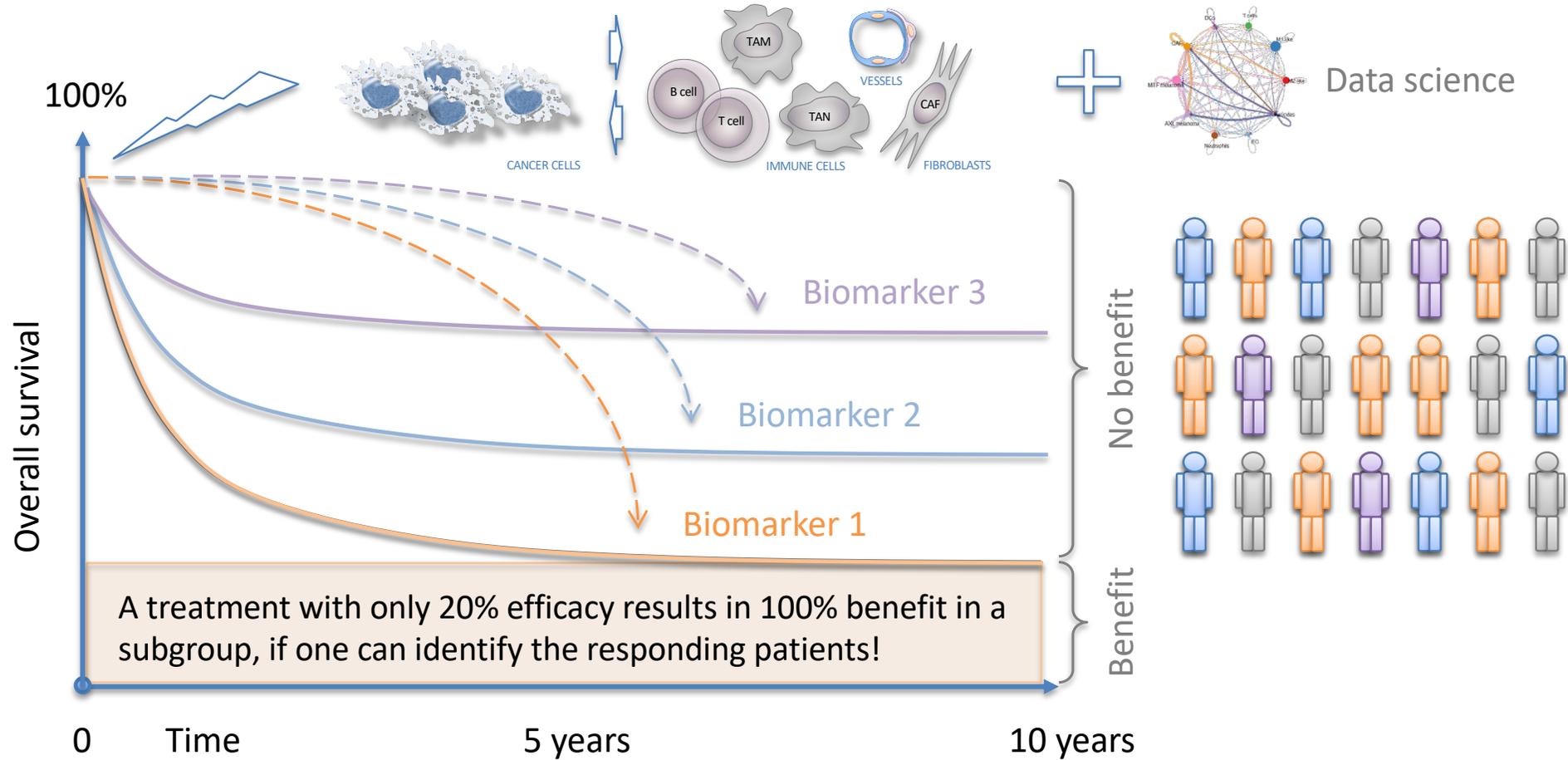
Prof. Olivier Michielin, MS, MD-PhD  
Head of Precision Oncology Center – Lausanne  
Prof. Bernd Bodenmiller, PhD  
ETH – Zurich

canton de  
vaud

Unil  
UNIL | Université de Lausanne



# Precision oncology & predictive biomarkers



# SPO-NDS Applicants

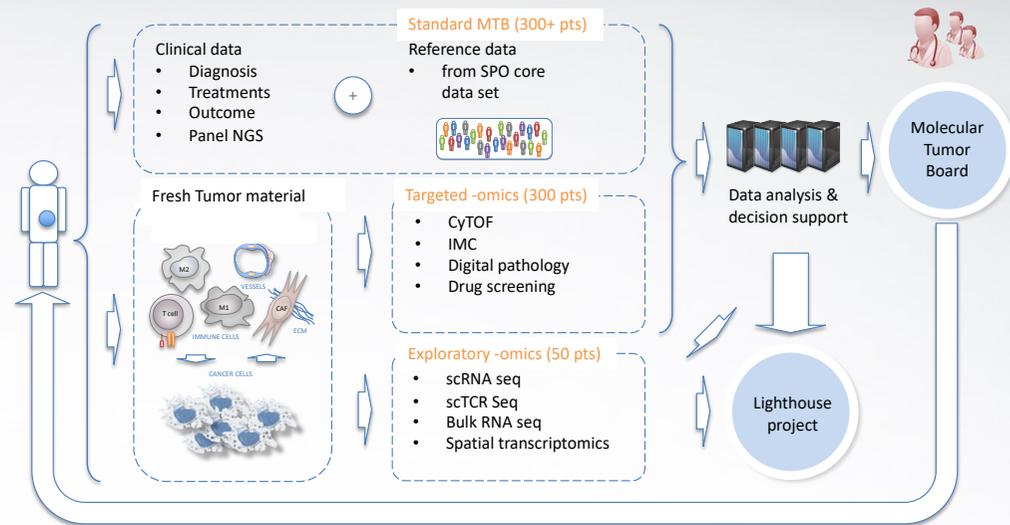
Olivier Michielin (CHUV, UNIL, SIB)  
Bernd Bodenmiller (ETH, UZH)  
Momo Bentires-Alj (UniBas, USB)  
Mitch Levesque (USZ, UZH)  
Andreas Wicki (USZ, UZH)  
George Coukos (CHUV, UNIL, EPFL)  
Nora C Toussaint (ETH, Nexus)  
Berend Snijder (ETH)  
Bram Stieltjes (USB)  
Christian Britschgi (USZ)  
Petros Tsantoulis (HUG)  
Simon Haefliger (Insel)  
Patrick Ruch (HES-SO)  
Christian Lovis (HUG)  
Miklos Pless (SAKK)  
Martin Reist (SAKK)  
Cristina Golfieri (UniBas)  
Sylvain Pradervand (CHUV, UNIL, SIB)

## Collaborators:

Jane Shaw (Global Patient Advocate Lead)  
Manuela Eicher (CHUV)  
Viola Heinzelmann (USB)  
Mikael Pittet (HUG/UNIGE)  
Raphael Gottardo (CHUV/UNIL)  
Santiago Carmona (UNIL)  
Jacques Fellay (EPFL)  
Andrew Janowczyk (CHUV/UNIL)  
Walter Weber (USB)  
Sacha Rothschild (USB)  
Benjamin Kasenda (USB)  
Heinz Läubli (USB)  
Marcus Vetter (USB)  
Bourquin Jean-Pierre (USZ)  
Renella Raffaele (CHUV/UNIL)  
Christian Kurzeder (USB)  
Matthias Matter (USB)  
Mark Rubin (UniBe)  
Gaspard Pardon (EPFL)  
Christoph Merten (EPFL)



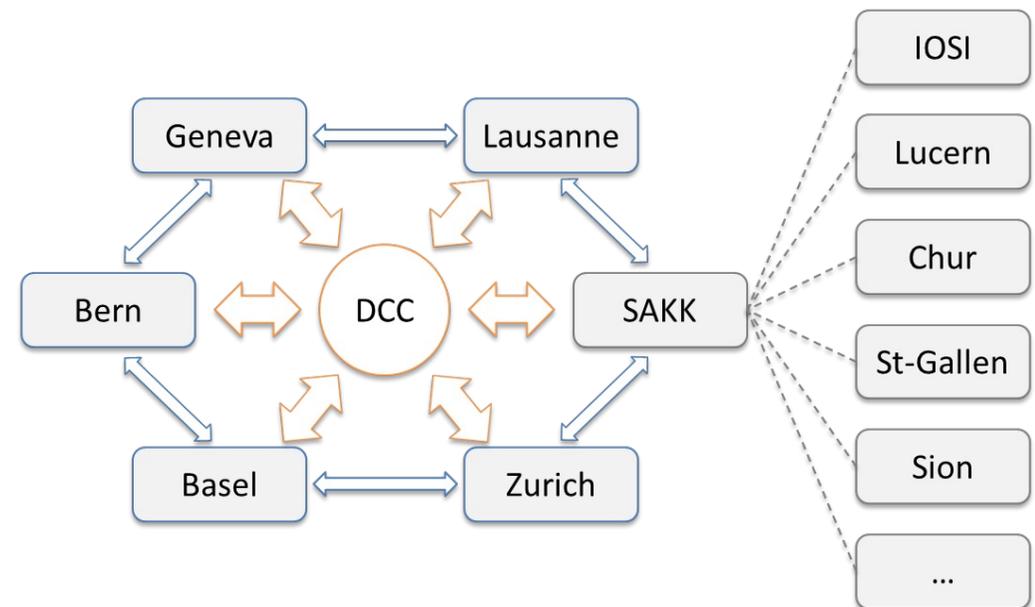
# Goals of the SPO-NDS proposal



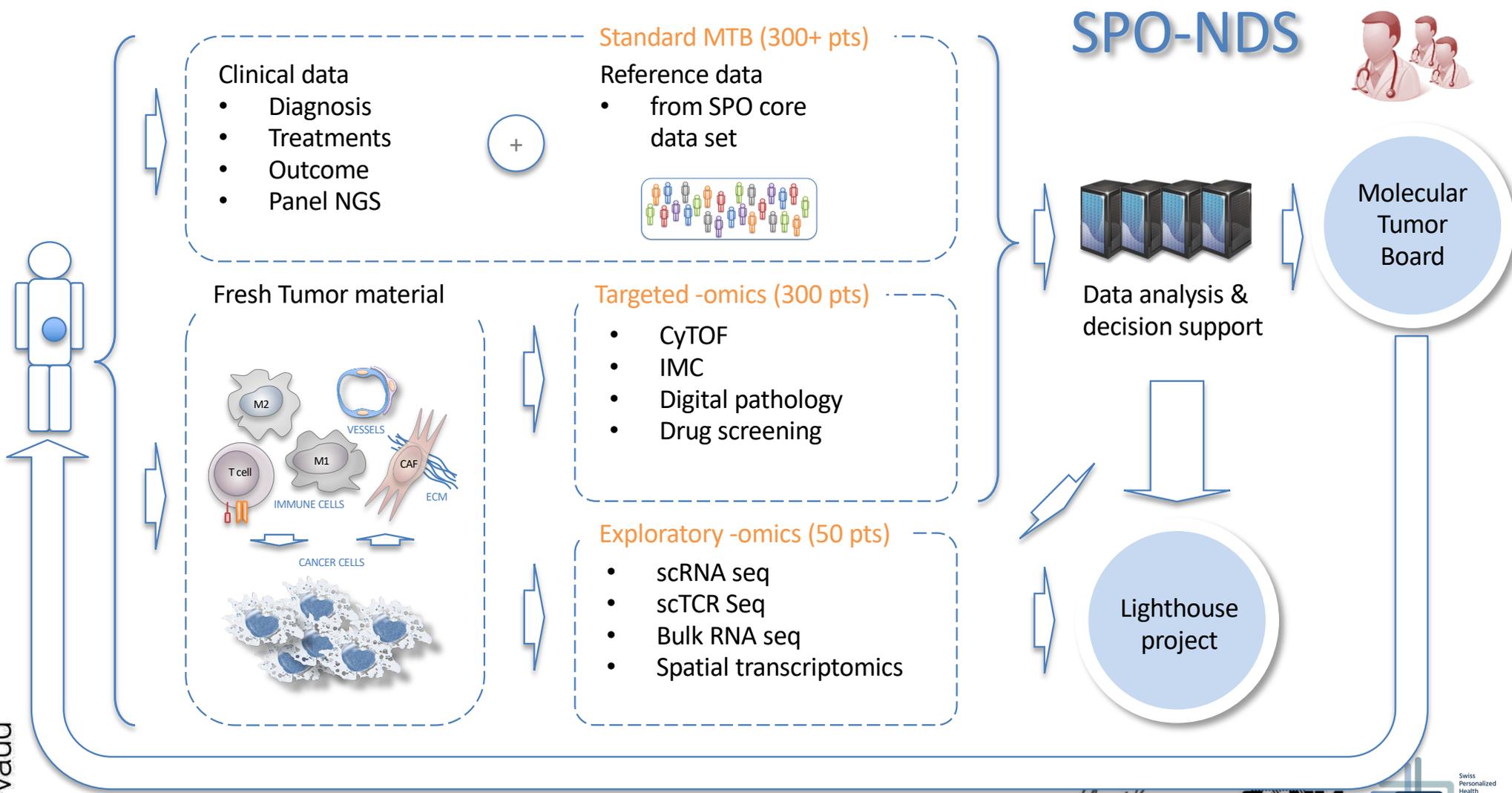
# SPO-NDS Overview: Objectives

Assemble 4 cohorts of specific cancer types treated with immuno-oncology (IO) therapies within the SPO national network to:

- Create a direct link to patient care, allowing new treatment opportunities for patients who have escaped standard of care therapies or for whom several standard of care options exist without a rationale for selection
- Identify the mechanisms of primary and acquired immunotherapy resistance within and between tumors with different immunoreactivities (Lighthouse project)



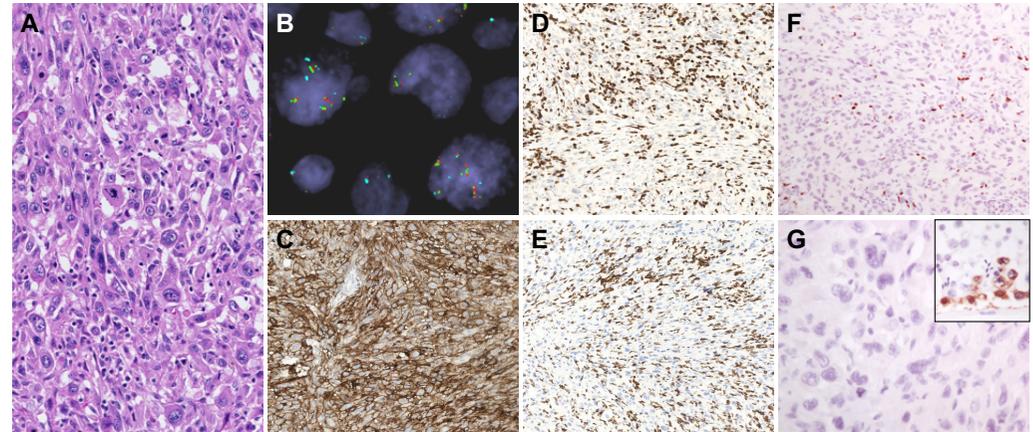
SPO National Network



Innovative therapeutic options

# Molecular Tumor Board: example of clinical outcome

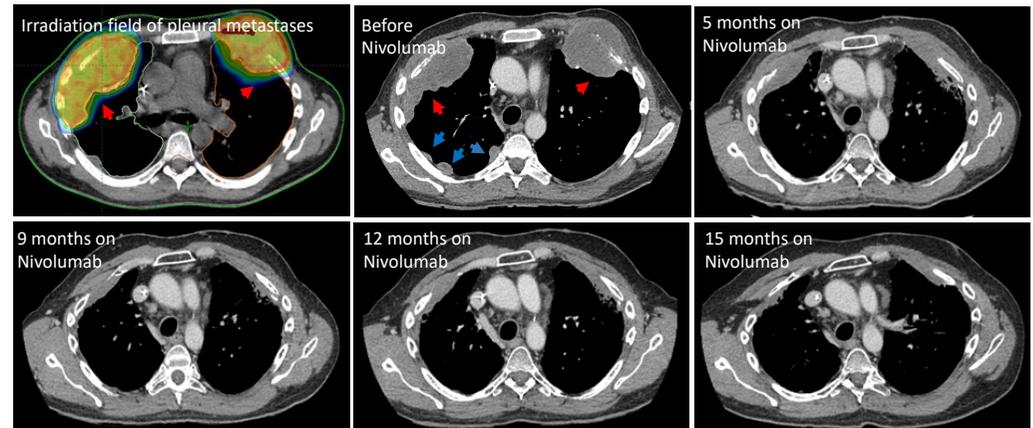
- Personalization focusses strongly on immuno-oncology
- Example of molecular tumor board case:
  - MPNST with PD-L1 amplification presenting a near CR on PD-1 blockade<sup>1</sup>
  - Patient followed in the private sector (Dr. Bohanes)



## Deep response to anti-PD-1 therapy of metastatic neurofibromatosis type 1-associated malignant peripheral nerve sheath tumor with *CD274/PD-L1* amplification

Berna C. Özdemir<sup>1,2</sup>, Pierre Bohanes<sup>3</sup>, Bettina Bisig<sup>4</sup>, Edoardo Missiaglia<sup>4</sup>, Petros Tsantoulis<sup>5</sup>, George Coukos<sup>1,6,7</sup>, Michael Montemurro<sup>1</sup>, Krisztian Homicsko<sup>1,6,7</sup>, Olivier Michielin<sup>1,6,7</sup>

COPY NUMBER VARIATIONS (CNV) <span style="border: 1px solid black; border-radius: 10px; padding: 2px;">PD-L1</span>			
REGION	GENES	TYPE OF VARIATION	ESTIMATED COPY NUMBER PER CELL
9p24-p23	<i>JAK2, CD274, PTPRD</i>	Amplification	≥5
9p22-p21	<i>CDKN2A, CDKN2B, FANCG</i>	Deletion	1
9q	All genes in the region	Amplification	≥5
11q	All genes in the region	Amplification	≥5



# SPO-NDS cohorts



**Melanoma:** Patients who have failed PD-1 adjuvant therapy and who are candidates for first line systemic treatments (200 / year\*).

**Non-small cell lung cancer:** Metastatic squamous NSCLC or non-oncogene-driven non-squamous NSCLC patients from the second line (300 / year\*).

**Colorectal cancer:** Microsatellite-instable CRC (10 / year\*) and microsatellite-stable CRC (200 / year) from the second line.

**Breast cancer:** Advanced triple negative breast cancer (200 / year\*).



\*number of cases within the swiss molecular tumor boards



# SPO-NDS work packages



**WP1**

Consolidation and expansion of SPO core dataset in all 5 University Hospitals and selected participating non-university hospitals

**WP2**

Standardization, management, and organization of multi-dimensional data

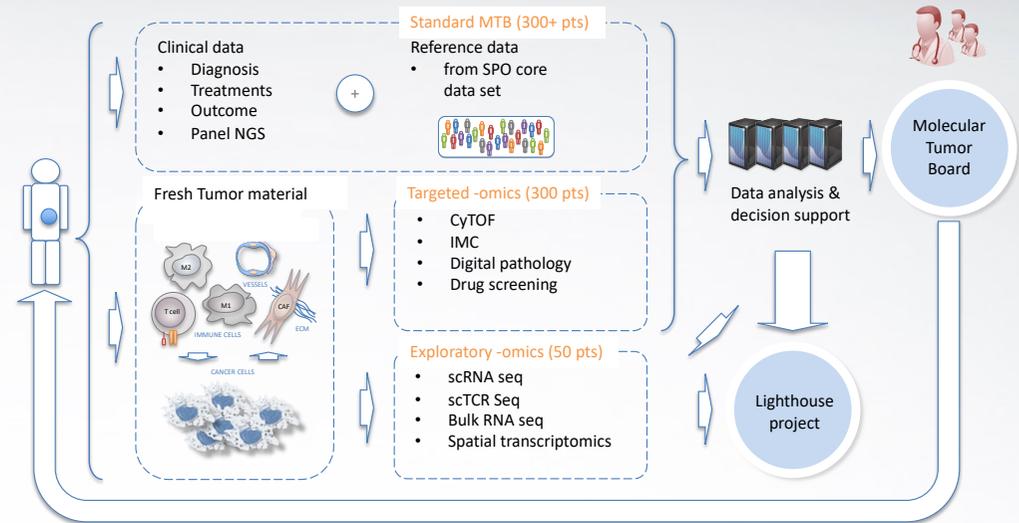
**WP3**

Adaptation of TuPro processes for a national molecular tumor board and molecular tumor boards in university hospitals

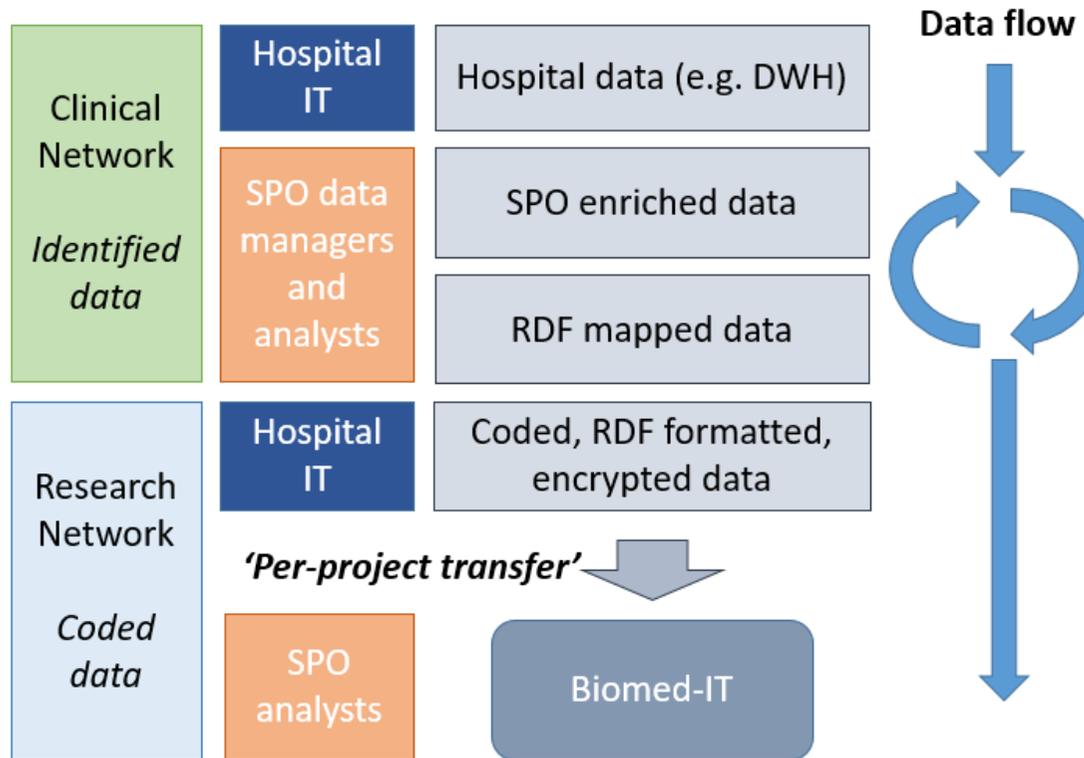
**WP4**

Comparative tumor atlas of patients with different levels of immunoresponsiveness (Lighthouse research project)

# Data flow and data management



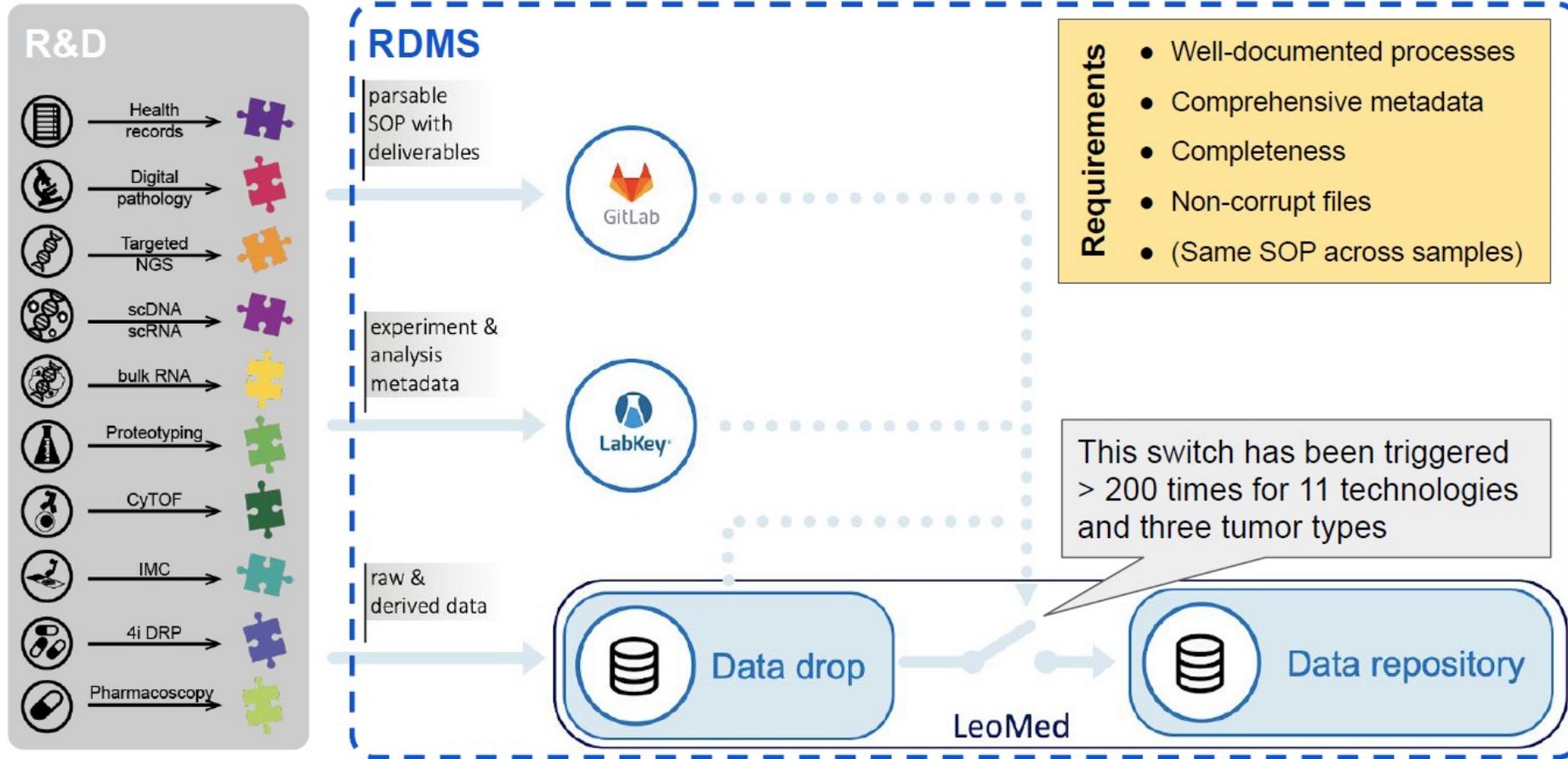
# Clinical Data flow



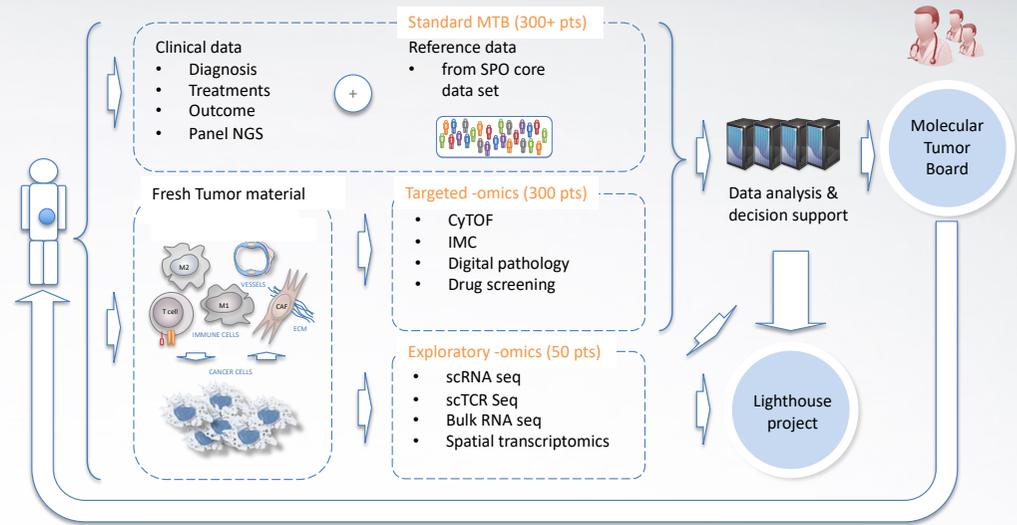
*For re-usability SPO data is recoded from within the hospital.*

*Same approach as the one used for the SPO driver*

# Tumor Profiler RDMS



# Governance



# Governance: SPO-NDS built on SPO Driver Project

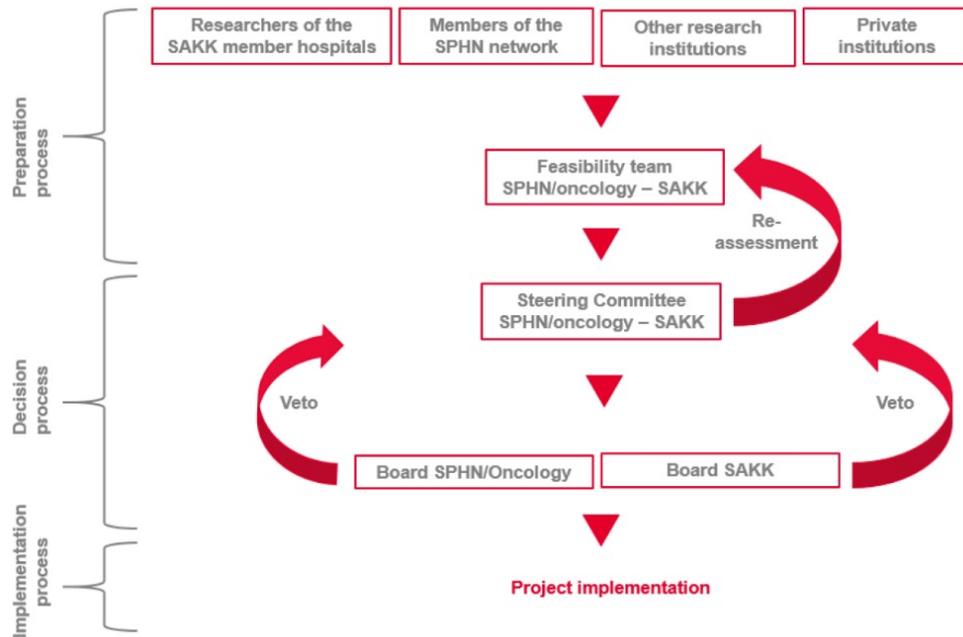
- **Amended** Ethic protocol (submitted to EKNZ on 25.02.2022)
- **Amended** Consortium Agreement (CA), including also:
  - **Amended** Data Transfer and Use Agreement (DTUA)
  - **Amended** Data Transfer and Processing Agreement (DTPA)
  - **Material Transfer Agreement (MTA)**
  - Amended CA will be soon send out to the legal departments for approval
- Governance Board:
  - Executive Board (members: one representative of each Data Provider)
  - Scientific Board (members: one representative of each Party)
  - PPI Advisory Board

# Data Governance (SPO-NDS & SCORED)

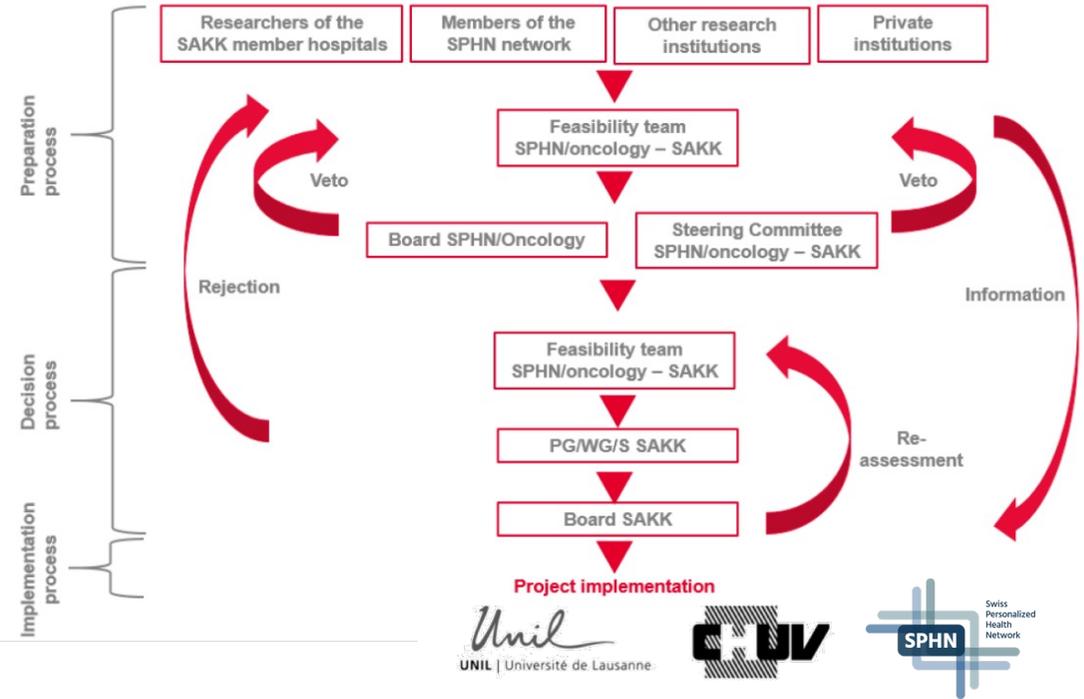


- For data access requests that involve both SPO-NDS datasets and the SCORED database developed by SAKK, specific approval processes and workflows have been defined (see Collaboration Guidelines SPO SAKK)

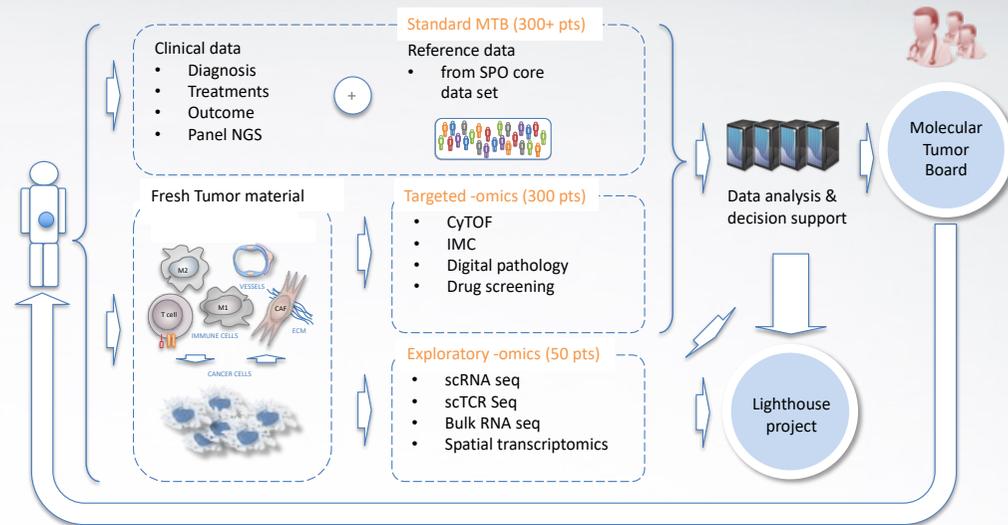
## 1) Submission process for research projects of retrospective data analysis



## 2) Submission process for registry projects (new variables or new patients)



# SPO-NDS: Lighthouse project



# Lighthouse research project (WP4)

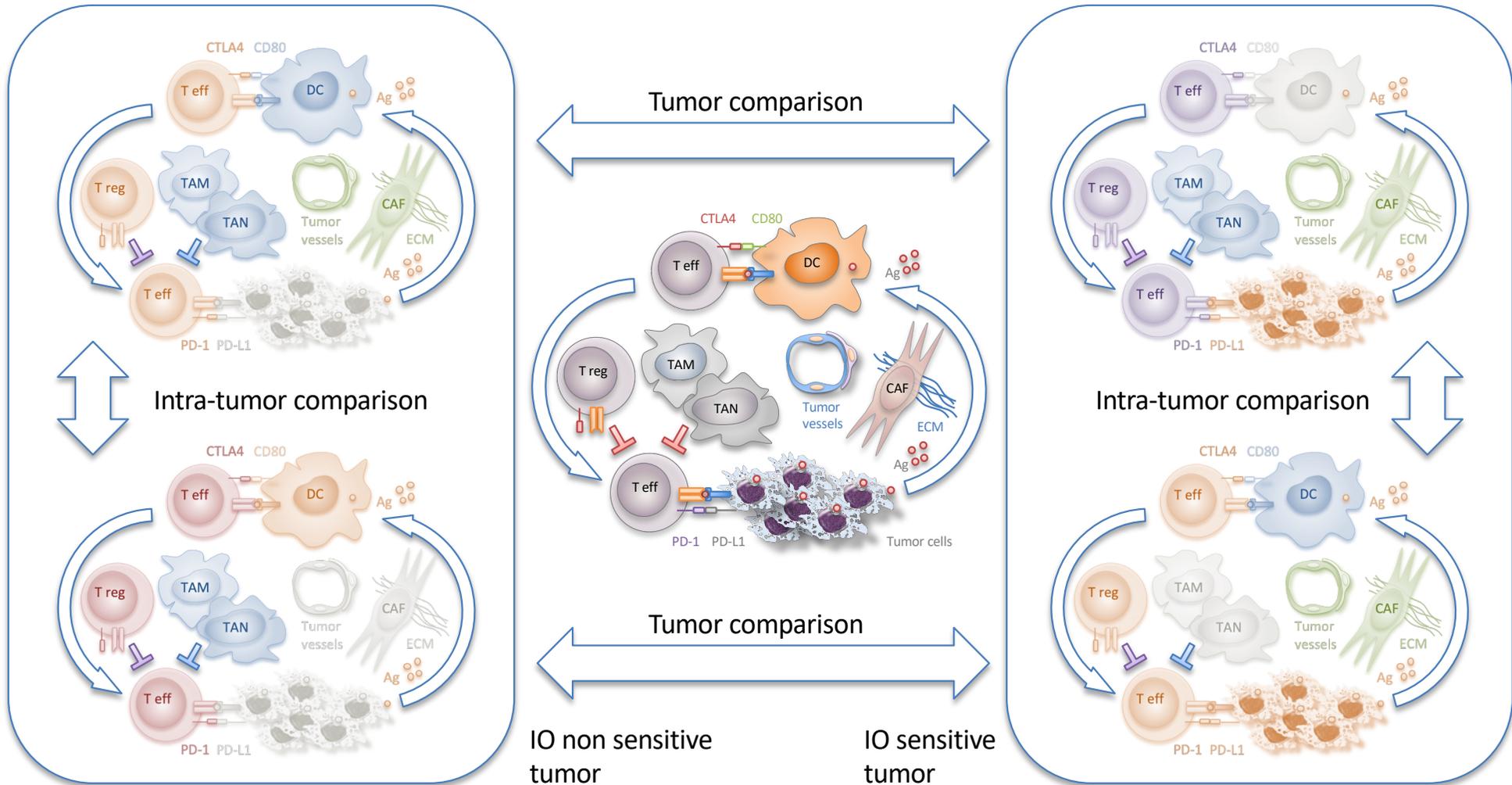


**Research question:** What are the mechanisms of primary and acquired immunotherapy resistance within and between tumors with different immunoreactivities?

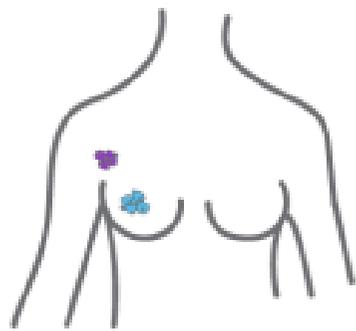


Comparative immune-oncology approach at the single-cell and multi-omics levels to identify **shared features of primary and acquired resistance to IO**. In particular, we will compare the cancer-immune ecosystems of patients and tumors that respond well to IO to those who fail to mount antitumor immune responses to IO.

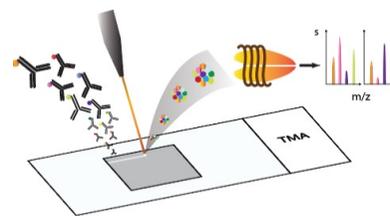
# Lighthouse research project (WP4)



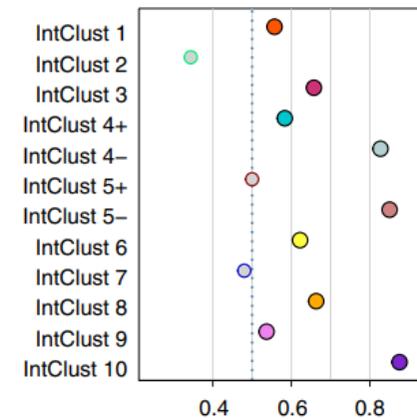
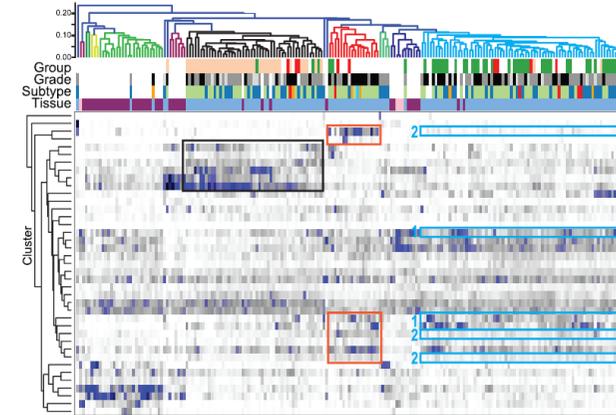
# Example of IO predictive biomarker for breast cancer



Primary breast cancer



144 patients CyTOF  
693 IMC



Patient group identification  
for immune checkpoint therapy

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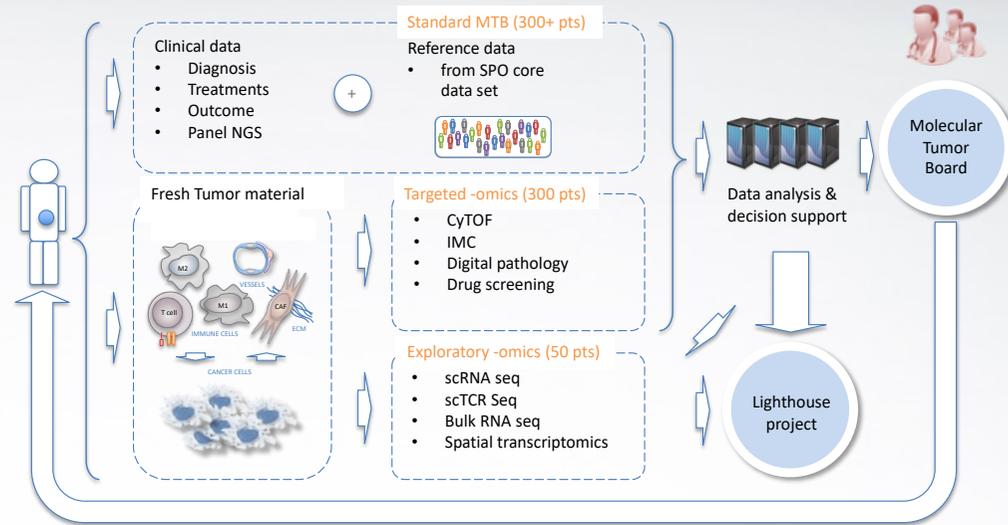
THANK YOU FOR  
YOUR ATTENTION!

canton de  
vaud

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# Backup slides



# SPO-NDS: infrastructure

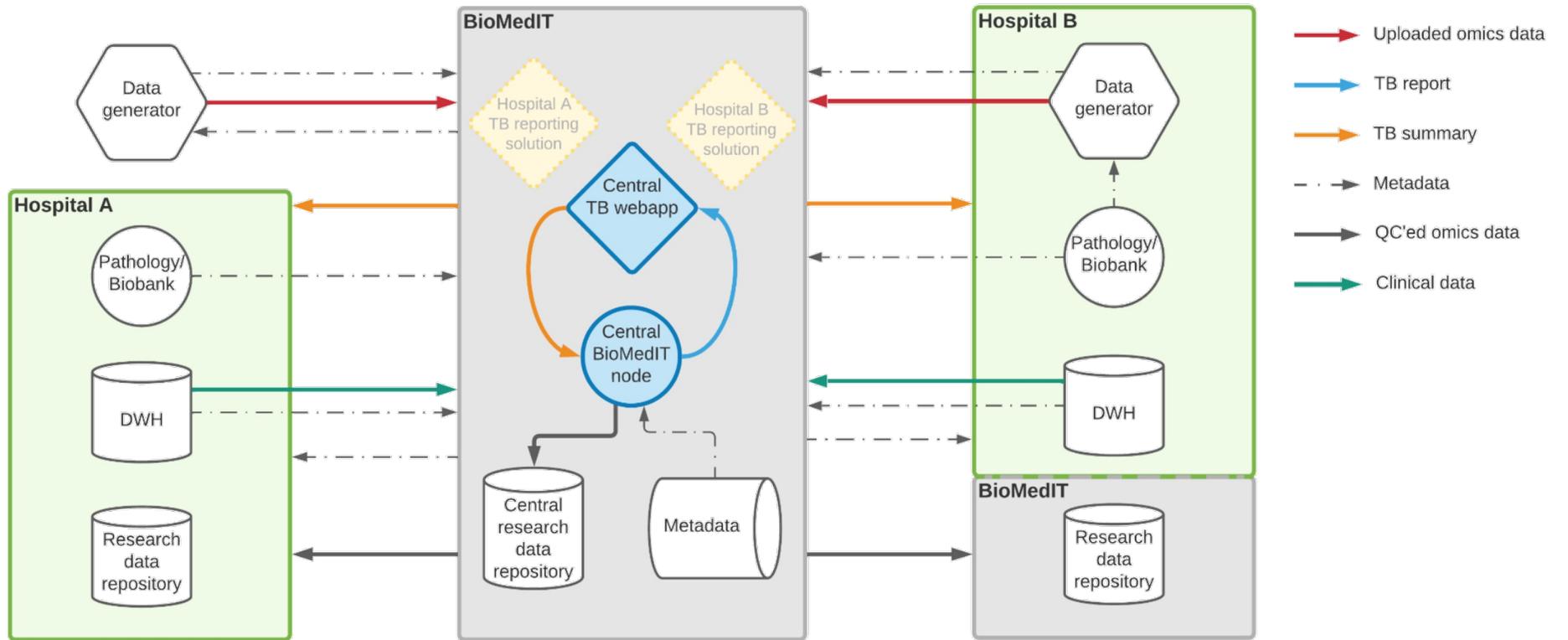
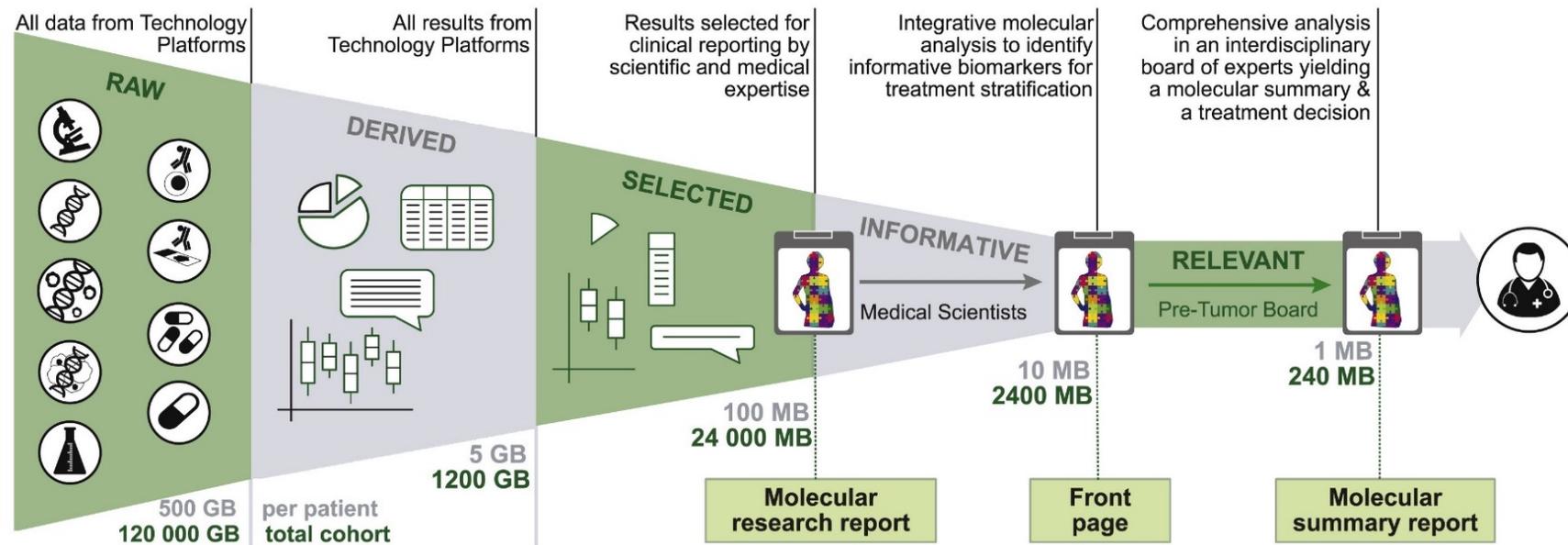


Figure 2. Overview of 'omics' data stream from data generation to data repository.

# From raw data to molecular summary report



# SPO-NDS Working Group

