

SPHN Joint Personalized Health Day
Bern | 24.08.2022

Swiss Personalized Oncology National Data Stream

SPHN Project

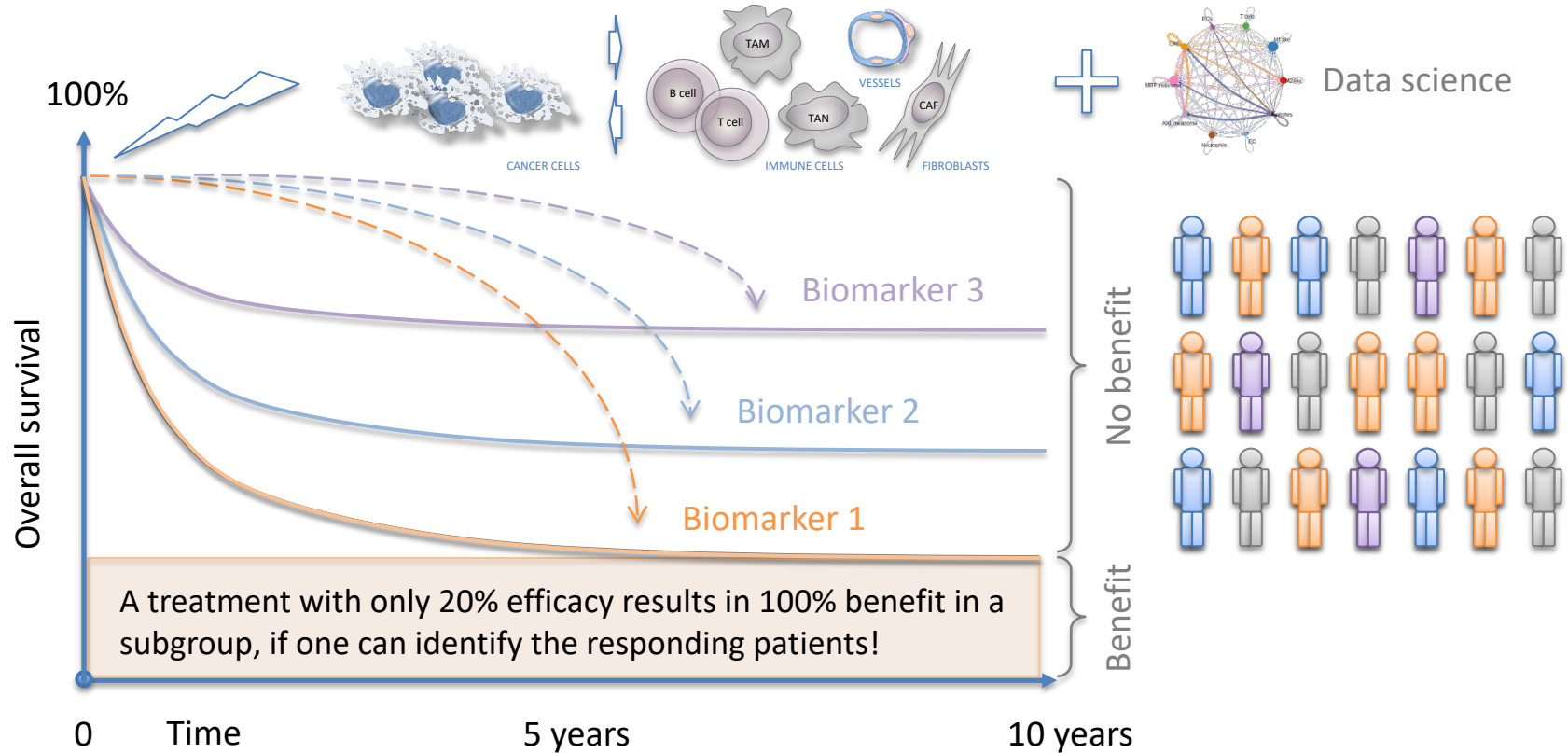
Prof. Olivier Michielin, MS, MD-PhD

Head of Precision Oncology Center – Lausanne

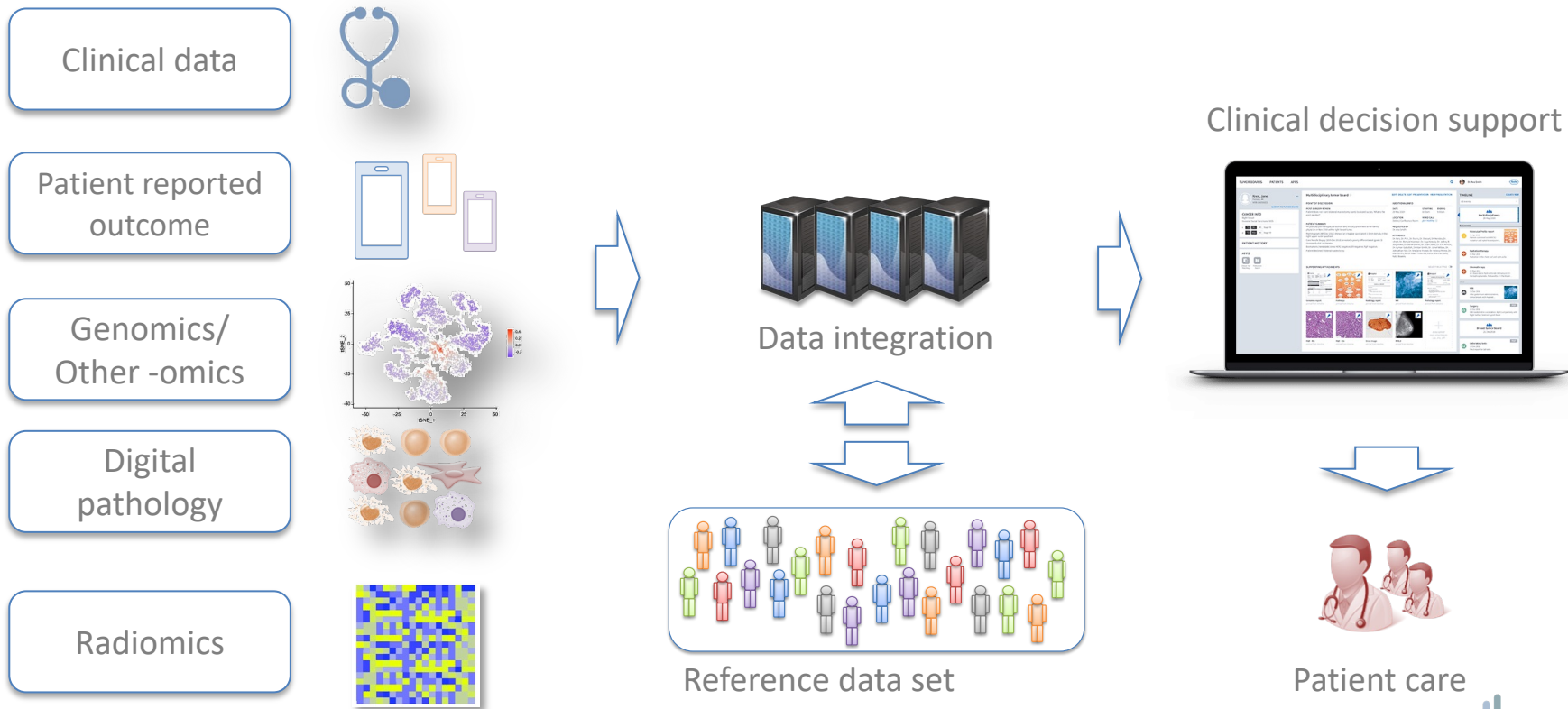
Prof. Bernd Bodenmiller, PhD

ETH – Zurich

Precision oncology & predictive biomarkers



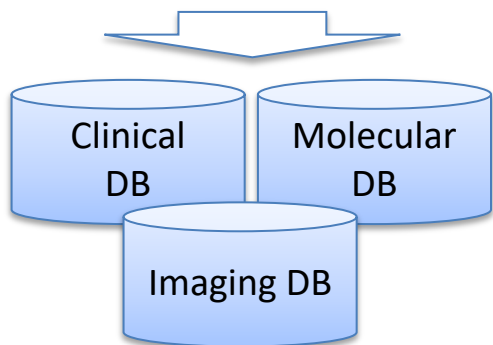
Precision oncology: integrating multiple data streams



Data strategy for SPO/SPHN: Minimal Data Set (MDS)

- Each hospital is adapting the cancer patient's information flow to generate the MDS automatically, insuring the sustainability of the SPO program

Electronic Patient Record



#	Group	Data Category	Required Single Data Point
1	DEMOGRAPHIC	Demographic	Year of birth
2			Gender
3	1st DIAGNOSIS	Classification	First date of diagnosis (Biopsy or Main Tumor)
4			CIM 10
5			ICD-O3 / Morphology
6		ICD-O3 / Topography	
7		Free text diagnosis	
8		TNM classification	
9		TNM Version	
10	Staging		Stage
11			Staging system
12			Grade
13			Grading system
14	TREATMENT	Therapy	Type of treatment
15			Date of treatment
16			Treatment specification
17	RESPONSE	Outcome	Method of assessment
18			Date of assessment
19			Results from the assessment (RECIST 1.1)
20			Updated stage
21			Staging system
22	SURVIVAL	PFS	Follow-up event
23			Date of follow-up event
24			Date of event
25		OS	Event type

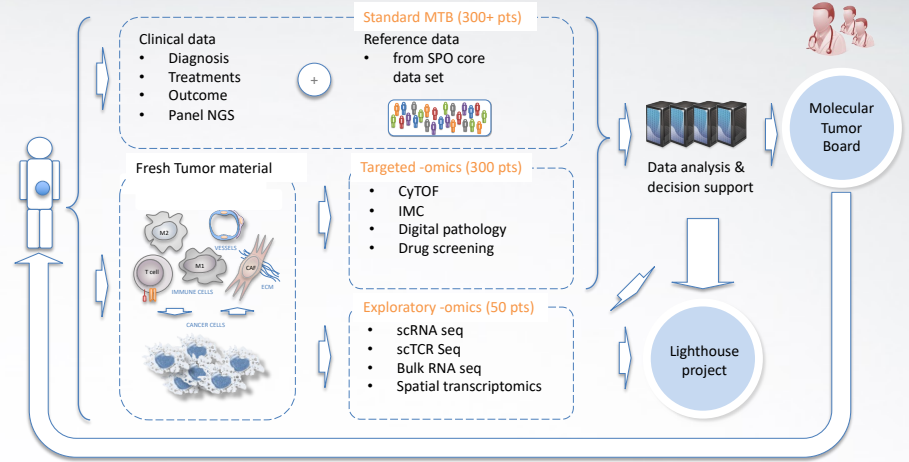


Local infrastructure @
Hospital X: heterogeneous

Interoperable MDS @
Hospital X: fully interoperable
MedCO/Tune Insight

Mutualisation via
SPO/SPHN

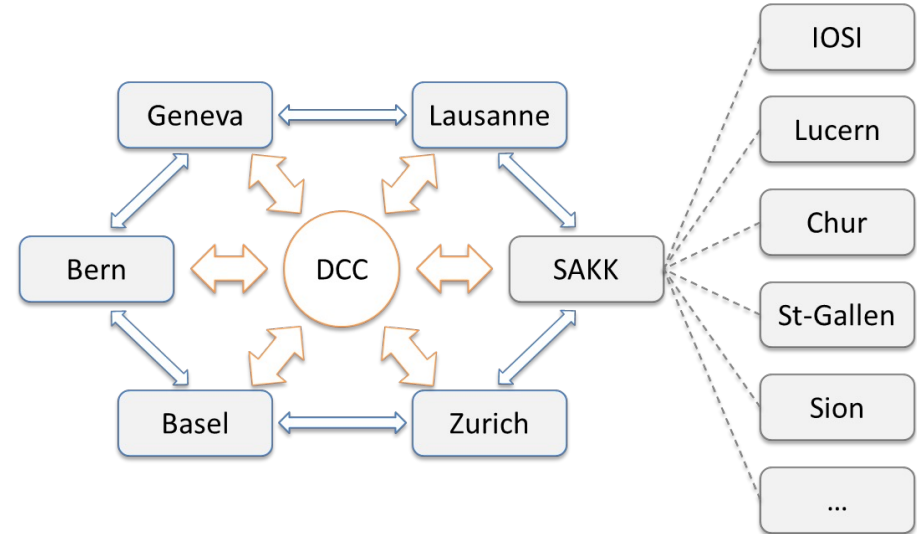
Goals of the SPO-NDS proposal



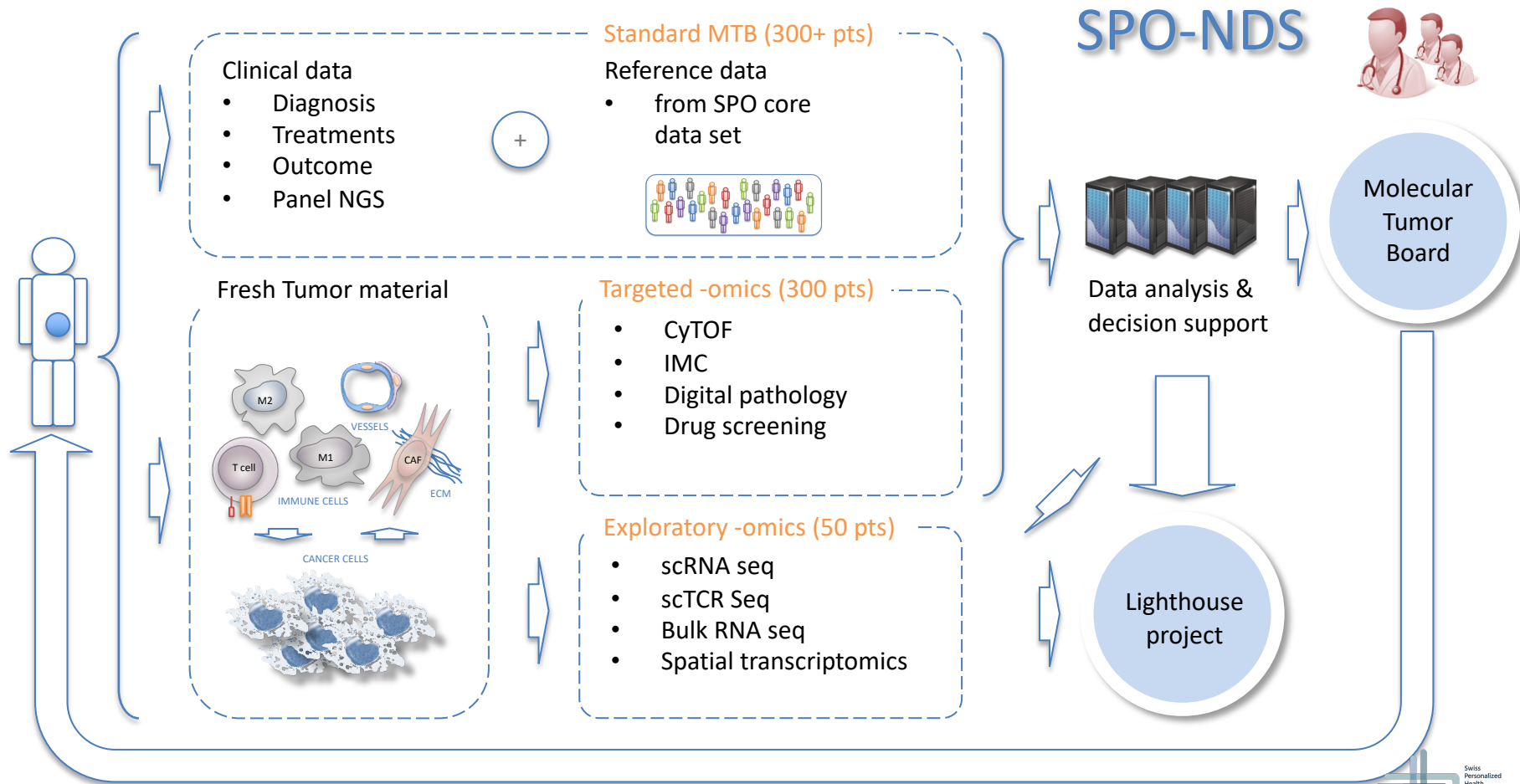
SPO-NDS Overview: Objectives

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 immune-reactivities (Lighthouse project)



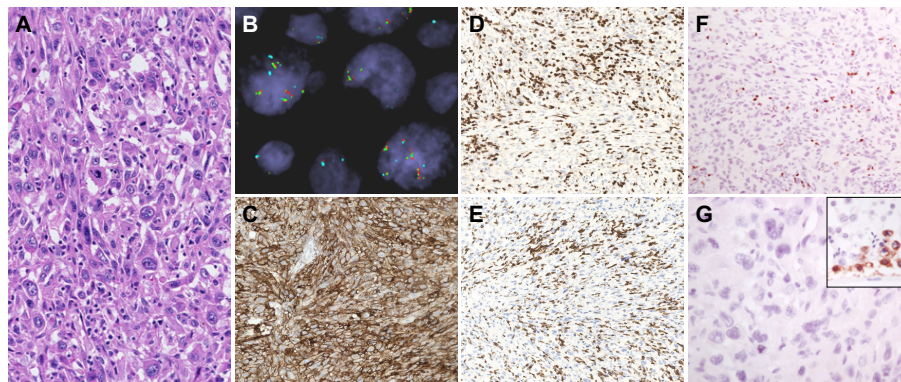
SPO National Network



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 blockade¹
 - Patient followed in the private sector (Dr. Bohanes)

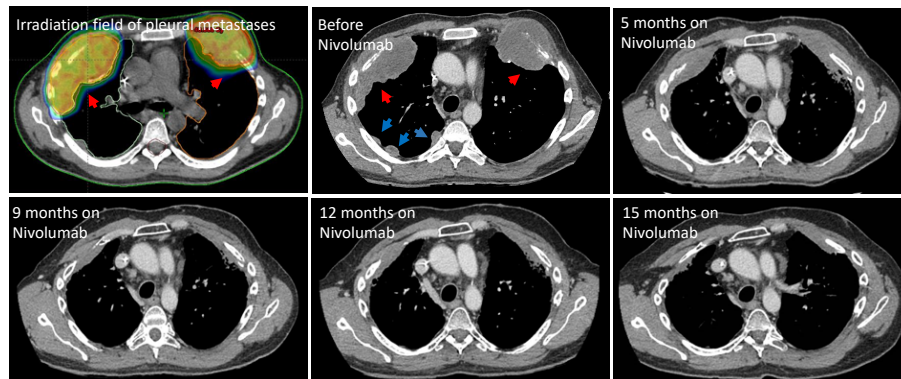


Deep response to anti-PD-1 therapy of metastatic neurofibromatosis type 1-associated malignant peripheral nerve sheath tumor with *CD274/PD-L1* amplification

Berna C. Özdemir^{1,2}, Pierre Bohanes³, Bettina Bisig⁴, Edoardo Missiaglia⁴, Petros Tsantoulis⁵, George Coukos^{1,6,7}, Michael Montemurro¹, Krisztian Homicsko^{1,6,7}, Olivier Michielin^{1,6,7}

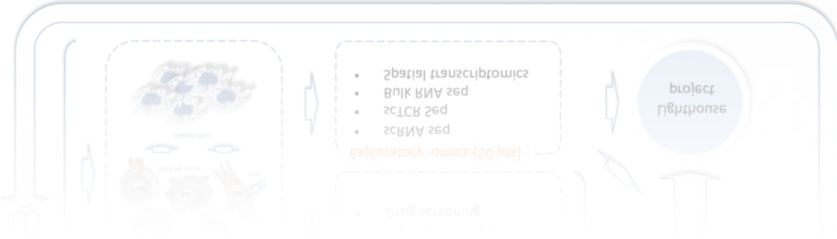
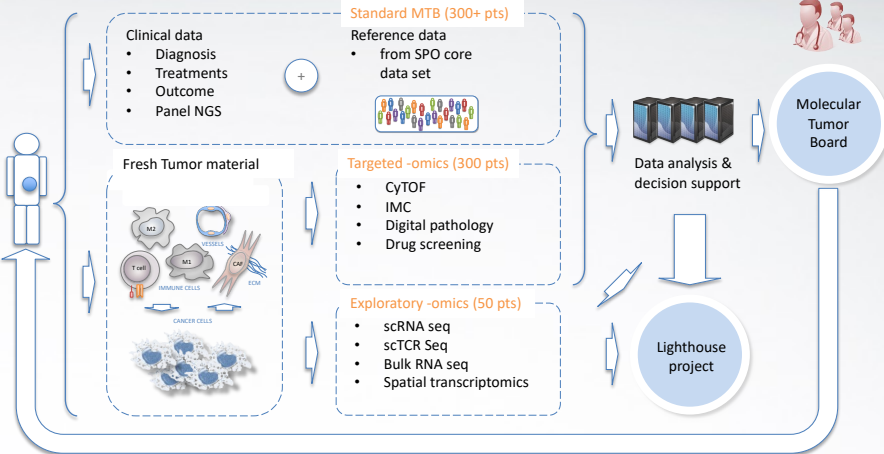
COPY NUMBER VARIATIONS (CNV)*			
REGION	GENES	TYPE OF VARIATION	ESTIMATED COPY NUMBER PER CELL
9p24-p23	<i>JAK2, CD274, PTPRD</i>	Amplification	≥5
9p22-p21	<i>CDKN2A, CDKN2B, FANCG</i>	Deletion	1
9q	All genes in the region	Amplification	≥5
11q	All genes in the region	Amplification	≥5

PD-L1



¹Ozdemir, *JCO PO* 2019

Governance



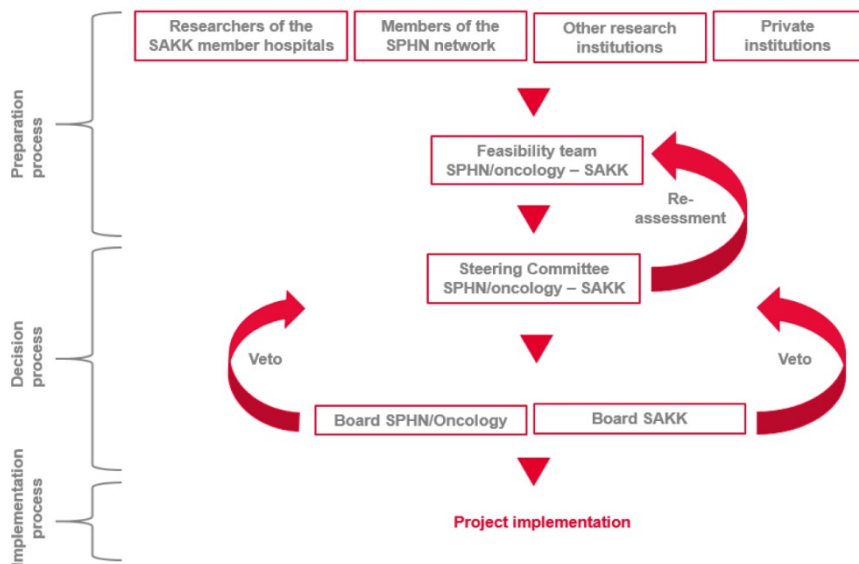
Governance: SPO-NDS built on SPO Driver Project

- **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

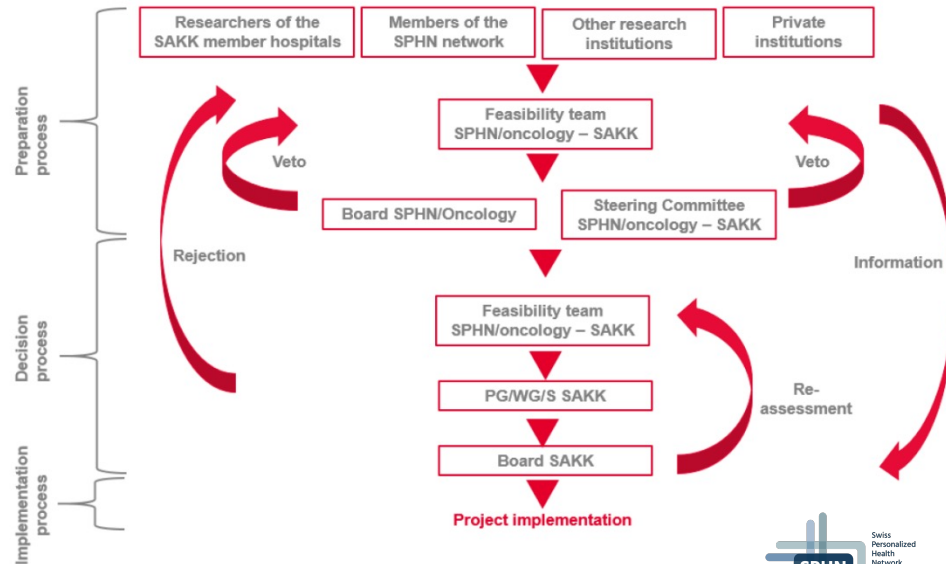
Data Governance (SPO-NDS & SCORED)

- 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)

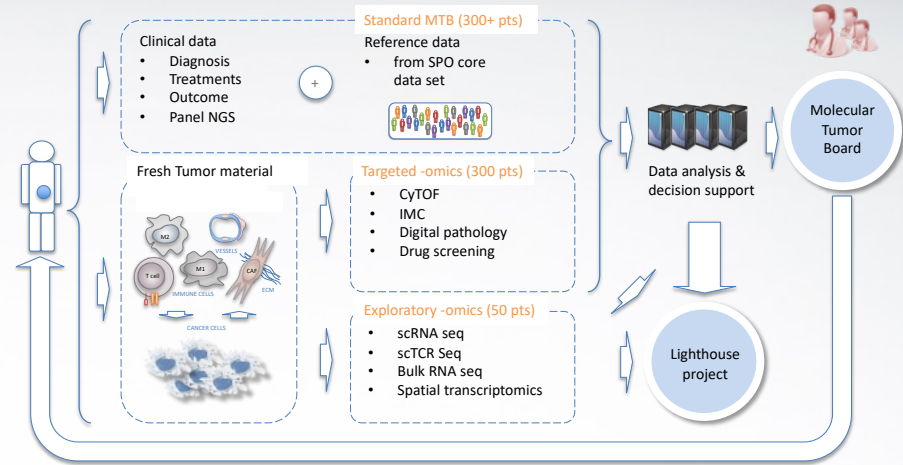
1) Submission process for research projects of retrospective data analysis



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

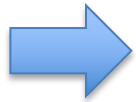


SPO-NDS: Lighthouse project



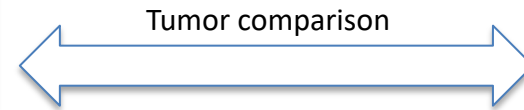
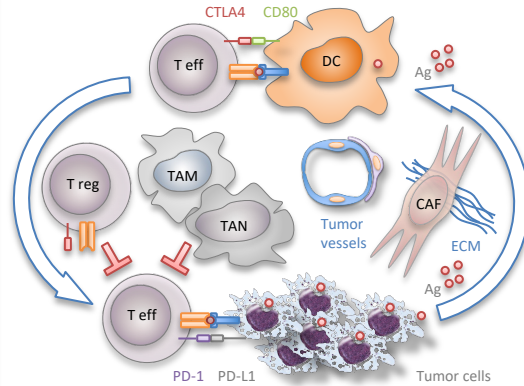
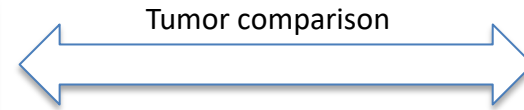
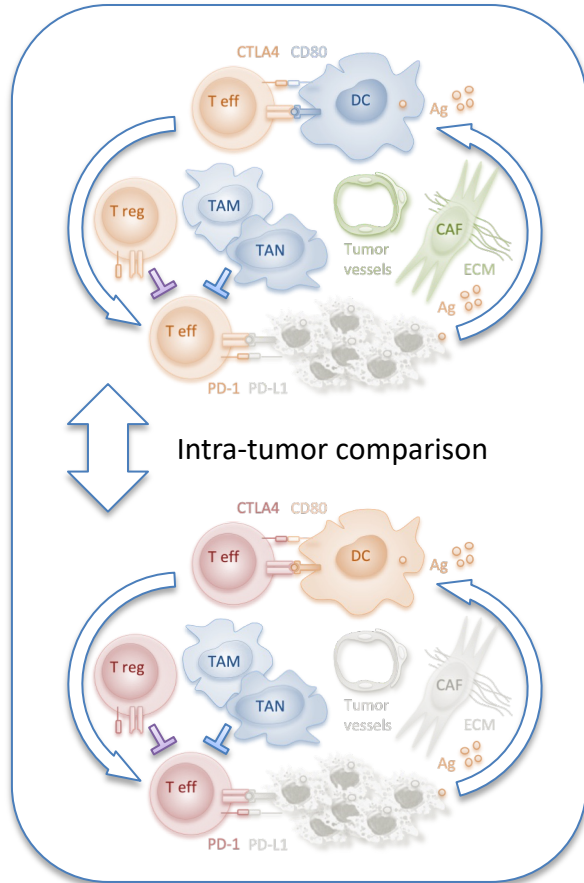
Lighthouse research project (WP4)

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



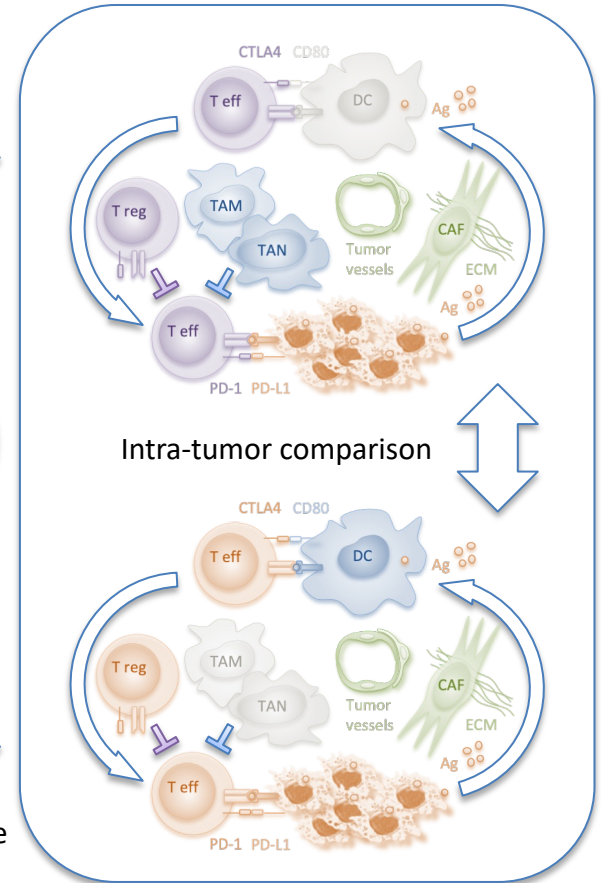
Comparative immune-oncology approach at the single-cell and multi-omics levels to identify **shared features of primary and acquired resistance to IO**. In particular, we will compare the cancer-immune ecosystems of patients and tumors that respond well to IO to those who fail to mount antitumor immune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

Lighthouse research project (WP4)



IO non sensitive
tumor

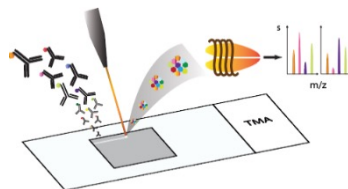
IO sensitive
tumor



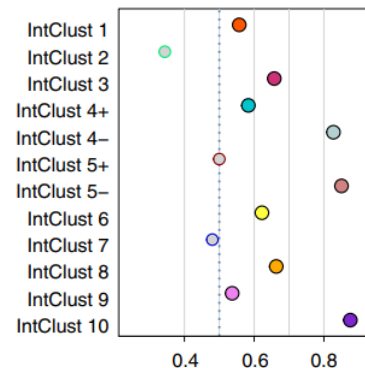
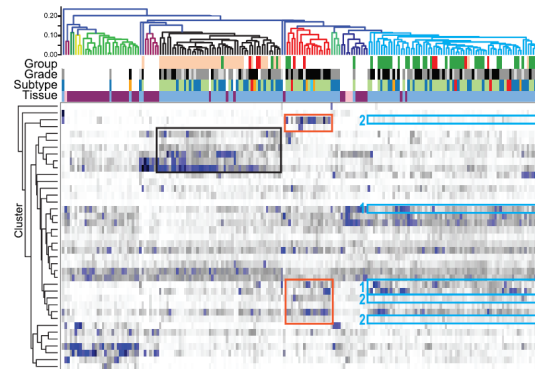
Example of IO predictive biomarker for breast cancer



Primary breast cancer



144 patients CyTOF
693 IMC



Patient group identification
for immune checkpoint therapy

Wagner, Cell 2017. Danenberg, Nature Genetics 2022.

SPO-NDS Applicants

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Jacques Fellay (EPFL)

Andrew Janowczyk (CHUV/UNIL)

Walter Weber (USB)

Sacha Rothschild (USB)

Benjamin Kasenda (USB)

Heinz Läubli (USB)

Marcus Vetter (USB)

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Christian Kurzeder (USB)

Matthias Matter (USB)

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Gaspard Pardon (EPFL)

Christoph Merten (EPFL)



Involvement of all major health institutions





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THANK YOU FOR YOUR
ATTENTION!